EXECUTIVE SUMMARY: PRE-CONSTRUCTION TRAFFIC STUDY SCUDDER FALLS BRIDGE REPLACEMENT Contract No. C-663A: Capital Project 0301A BUCKS COUNTY, PA | MERCER COUNTY, NJ



PREPARED FOR: DELAWARE RIVER JOINT TOLL BRIDGE COMMISSION ADMINISTRATION BUILDING 110 WOOD AND GROVE STREETS MORRISVILLE, PA 19067

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DRJT1501 | JULY 1, 2016



PARTNERS FOR WHAT'S POSSIBLE

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1. Introduction

Engineering Group.

The Delaware River Joint Toll Bridge Commission (Commission) owns and operates 20 bridges crossing the Delaware River from Morrisville, Pennsylvania in the south to Milford, Pennsylvania approximately 140 miles to the north. Of these, seven (7) are "Toll Bridges" and the remaining 13 are "Toll-Supported Bridges". The I-95/Scudder Falls Bridge, which is currently not a tolled facility, is an important commuter connection between Bucks County, PA and Mercer County, NJ. The bridge carried an average of 58,400 vehicles per day in 2014, far more than it was designed to handle. National Bridge Inventory (NBI) has classified this bridge as functionally obsolete due to concerns with capacity, safety deficiencies, lack of shoulders, and poor approach roadway geometry. The Commission is proposing to replace the Scudder Falls Bridge, which will include 4.4 miles of roadway improvements along I-95. The improvements will include an additional travel lane, adequate outside and inside shoulders in each direction with auxiliary lanes, and other improvements to accommodate entry and exit from the PA Taylorsville Road and NJ Route 29 Interchanges. Once constructed, the Commission has decided that tolls will be implemented in the southbound direction by means of All Electronic Tolling (AET). The Commission completed a traffic diversion study to forecast the volume of traffic that would divert from the new Scudder Falls Bridge to alternate locations once tolls were implemented on the new bridge. The results of the traffic diversion study are documented in the *Scudder Falls Bridge Traffic Diversion Study* by Jacobs

In April 2012, an Interagency Agreement was made between the Commission, the Pennsylvania Department of Transportation (PennDOT), and the New Jersey Department of Transportation (NJDOT). Based on the agreement:

- The Commission will perform a pre-construction and post-construction traffic study and analysis to verify the *Scudder Falls Bridge Traffic Diversion Study*.
- The Commission will take reasonable measures to mitigate for traffic diversion impacts on Pennsylvania and New Jersey state roads in the event the traffic study and analysis identifies traffic issues.
- The pre-construction and post-construction traffic study will include traffic counts including turning movements at major intersections and tube counts for the roadway segments.
- If the pre-construction and post-construction peak hour volumes are within 15% of each other and the v/c ratio is below 0.75, no further traffic analysis is required.
- If the post-construction peak hour volumes are greater than 15% from the pre-construction study peak hour volumes or the v/c ratio is above 0.75, the post-construction volumes shall be projected to the 2030 design year and the v/c ratios calculated for the year 2030 using the most recent version of the Highway Capacity Manual.
- With the exception of the bridges and roadways within the Commission's right of way, if the post-construction traffic study results in a v/c ratio of 0.9, or greater for the design year 2030, the parties agree that mitigation in the form of roadway improvements to the impacted roadways are warranted. The mitigation shall result in a v/c ratio below 0.9, or as close to the pre-construction v/c ratio as reasonable.

Pennoni Associates Inc. (Pennoni) has been retained by the Commission to complete the pre-construction traffic study to assess the existing conditions of all the intersections, roadway segments, interchanges, and bridges within the project study area. This study will serve as the baseline for purposes of determining the traffic diversion impacts from tolling the new Scudders Falls Bridge. The traffic study includes daily and peak hour traffic counts, average annual daily traffic (AADT) calculations, and peak hour volume-to-capacity (v/c) ratios for various roadway segments in the vicinity of the project. The traffic data collection and analysis was completed in accordance with PennDOT Publication 46 and NJDOT Highway Access Management Code, Title 16, Chapter 47.



2. Study Area

Study area defined for the project includes intersections, roadways, bridges and interchanges that may be affected once tolls are implemented on the new Scudder Falls Bridge. The study area locations are described in **Table 1** and graphically presented in **Figure 1**.

No.	Location	STATE	TYPE	
1	Washington Crossing Toll Supported Bridge	-	BRIDGE	
2	PA Route 532 (General Washington Memorial Blvd)/PA Route 32 (River Rd) Intersection	PA	INTERSECTION	
3	NJ Route 546 (Washington Crossing Pennington Rd)/NJ Route 29 (River Rd) Intersection	NJ	INTERSECTION	
4	Scudder Falls Bridge (I-95)	-	BRIDGE	
5	Calhoun Street Toll Supported Bridge	-	BRIDGE	
6	PA Route 32 (Delmorr Ave)/Trenton Avenue (SR 2026) Intersection	PA	INTERSECTION	
7	NJ Route 29 (River Rd)/Calhoun Street Interchange			
7.1	NJ Route 29 (River Rd)/Calhoun Street Interchange NB Route 29 Off Ramp to EB Calhoun Street			
7.2	NJ Route 29 (River Rd)/Calhoun Street Interchange NB Route 29 On Ramp from EB Calhoun Street			
7.3	NJ Route 29 (River Rd)/Calhoun Street Interchange NB Route 29 Off Ramp to WB Calhoun Street			
7.4	NJ Route 29 (River Rd)/Calhoun Street Interchange NB Route 29 On Ramp from WB Calhoun Street	NJ	INTERCHANGE	
7.5	NJ Route 29 (River Rd)/Calhoun Street Interchange SB Route 29 Off Ramp to EB Calhoun Street			
7.6	NJ Route 29 (River Rd)/Calhoun Street Interchange SB Route 29 On Ramp from EB Calhoun Street			
7.7	NJ Route 29 (River Rd)/Calhoun Street Interchange SB Route 29 Off Ramp to WB Calhoun Street			
7.8	NJ Route 29 (River Rd)/Calhoun Street Interchange SB Route 29 On Ramp from WB Calhoun Street			
8	Lower Trenton Toll Supported Bridge	-	BRIDGE	
9	Bridge Street (SR 0032)/Delmorr Avenue (SR 0032) Intersection	PA	INTERSECTION	
10	Trenton - Morrisville (Route 1) Toll Bridge	-	BRIDGE	
11	I-95/U.S. Route 1 Interchange in PA			
11.1	I-95/U.S. Route 1 Interchange in PA NB I-95 Off Ramp to US 1 NB			
11.2	I-95/U.S. Route 1 Interchange in PA NB I-95 Off Ramp to US 1 SB			
11.3	I-95/U.S. Route 1 Interchange in PA NB I-95 On Ramp from US 1 NB			
11.4	I-95/U.S. Route 1 Interchange in PA NB I-95 On Ramp from US 1 SB			
11.5	I-95/U.S. Route 1 Interchange in PA SB I-95 Off Ramp to US 1 NB	PA	INTERCHANGE	
11.6	I-95/U.S. Route 1 Interchange in PA SB I-95 Off Ramp to US 1 SB			
11.7	I-95/U.S. Route 1 Interchange in PA SB I-95 On Ramp from US 1 NB			
11.8	I-95/U.S. Route 1 Interchange in PA SB I-95 On Ramp from US 1 SB			
12	I-95/U.S. Route 1 Interchange in NJ	NU		
12.1	I-95/U.S. Route 1 Interchange in NJ NB I-95 Off Ramp to Both Directions US 1	NJ	INTERCHANGE	

Table 1: Study Area



Pre-Construction Traffic Study for the

Scudder Falls Bridge Replacement Project

No.	Location	STATE	TYPE	
12.2	I-95/U.S. Route 1 Interchange in NJ NB I-95 On Ramp from US 1 SB			
12.3	I-95/U.S. Route 1 Interchange in NJ NB I-95 On Ramp from US 1 NB			
12.4	I-95/U.S. Route 1 Interchange in NJ SB I-95 Off Ramp to US 1 NB			
12.5	I-95/U.S. Route 1 Interchange in NJ SB I-95 Off Ramp to US 1 SB			
12.6	I-95/U.S. Route 1 Interchange in NJ SB I-95 On Ramp from US 1 NB			
12.7	I-95/U.S. Route 1 Interchange in NJ SB I-95 On Ramp from US 1 SB			
12.8	I-95/U.S. Route 1 Interchange in NJ SB US 1 On Ramp from I-95 NB			
13	I-95 Between U.S. Route 1 and PA Route 332 (Yardley Newtown Rd) Interchanges	PA	ROADWAY	
14	I-95/PA Route 332 (Yardley Newtown Rd) Interchange			
14.1	I-95/PA Route 332 (Yardley Newtown Rd) Interchange NB I-95 Off Ramp to PA Route 332 (Yardley Newtown Rd) Both Directions			
14.2	I-95/PA Route 332 (Yardley Newtown Rd) Interchange NB I-95 On Ramp from PA Route 332 Yardley Newtown Rd) EB		INTERCHANGE	
14.3	I-95/PA Route 332 (Yardley Newtown Rd) Interchange NB I-95 On Ramp from PA Route 332 (Yardley Newtown Rd) WB	PA		
14.4	I-95/PA Route 332 (Yardley Newtown Rd) Interchange SB I-95 Off Ramp to PA Route 332 (Yardley Newtown Rd) Both Directions			
14.5	I-95/PA Route 332 (Yardley Newtown Rd) Interchange SB I-95 On Ramp from PA Route 332 (Yardley Newtown Rd) Both Directions			
15	I-95 Between PA Route 332 (Yardley Newtown Rd) and Taylorsville Road (SR 2071) Interchanges	PA	ROADWAY	
16	I-95/Taylorsville Road (SR 2071) Interchange			
16.1	I-95/Taylorsville Road (SR 2071) Interchange NB I-95 Off Ramp to Taylorsville Road (SR 2071) Both Directions			
16.2	I-95/Taylorsville Road (SR 2071) Interchange NB I-95 On Ramp from Taylorsville Road (SR 2071) EB			
16.3	I-95/Taylorsville Road (SR 2071) Interchange NB I-95 On Ramp from Taylorsville Road (SR 2071) WB	PA	INTERCHANGE	
16.4	I-95/Taylorsville Road (SR 2071) Interchange SB I-95 Off Ramp to Taylorsville Road (SR 2071) WB			
16.5	I-95/Taylorsville Road (SR 2071) Interchange SB I-95 Off Ramp to Taylorsville Road (SR 2071) EB			
16.6	I-95/Taylorsville Road (SR 2071) Interchange SB I-95 On Ramp from Taylorsville Road (SR 2071) Both Directions			
17	I-95/NJ Route 29 (River Rd) Interchange (SEE ACCOMPANYING INTERCHANGE SHEET)	NJ	INTERCHANGE	
18	I-95 Between NJ Route 29 (River Rd) and Bear Tavern Road (CR 579) Interchanges	NJ	ROADWAY	
19	I-95/Bear Tavern Road (CR 579) Interchange			
19.1	I-95/Bear Tavern Road (CR 579) Interchange NB I-95 Off Ramp to Bear Tavern Road (CR 579) Both Directions	NJ	INTERCHANGE	



Pre-Construction Traffic Study for the

Scudder Falls Bridge Replacement Project

No.	Location	STATE	ТҮРЕ	
19.2	I-95/Bear Tavern Road (CR 579) Interchange NB I-95 On Ramp from Bear Tavern Road (CR 579) Both Directions			
19.3	I-95/Bear Tavern Road (CR 579) Interchange SB I-95 Off Ramp to Bear Tavern Road (CR 579) Both Directions			
19.4	I-95/Bear Tavern Road (CR 579) Interchange SB I-95 On Ramp from Bear Tavern Road (CR 579) WB			
19.5	I-95/Bear Tavern Road (CR 579) Interchange SB I-95 On Ramp from Bear Tavern Road (CR 579) EB			
20	I-95 Between Bear Tavern Road (CR 579) and Scotch Road (CR 611) Interchanges	NJ	ROADWAY	
21	I-95/Scotch Road (CR 611) Interchange			
21.1	I-95/Scotch Road (CR 611) Interchange NB Scotch Road (CR 611) off ramp to I-95 NB			
21.2	I-95/Scotch Road (CR 611) Interchange NB Scotch Road (CR 611) off ramp to I-95 SB			
21.3	I-95/Scotch Road (CR 611) Interchange NB Scotch Road (CR 611) on ramp from I-95 NB			
21.4	I-95/Scotch Road (CR 611) Interchange NB Scotch Road (CR 611) on ramp from I-95 SB	NJ	INTERCHANGE	
21.5	I-95/Scotch Road (CR 611) Interchange SB Scotch Road (CR 611) off ramp to I-95 NB			
21.6	I-95/Scotch Road (CR 611) Interchange SB Scotch Road (CR 611) off ramp to I-95 SB			
21.7	I-95/Scotch Road (CR 611) Interchange SB Scotch Road (CR 611) on ramp from I-95 NB			
21.8	I-95/Scotch Road (CR 611) Interchange SB Scotch Road (CR 611) on ramp from I-95 SB			
22	Washington Crossing Road (Route 532) From S.R. 2081 (Wrightstown Rd) to S.R. 2075 (Dolington Rd)	PA	ROADWAY	
23	Washington Crossing Road (Route 532) From S.R. 2075 (Dolington Rd) to S.R. 2069 (Lindenhurst Rd)	PA	ROADWAY	
24	Taylorsville Rd. (S.R. 2071) Between Route 532 (Washington Crossing Rd) and I-95	PA	ROADWAY	
25	Taylorsville Rd. (S.R. 2071) Between Route I-95 and S.R. 2075 (Dolington Rd)	PA	ROADWAY	
26	Taylorsville Rd. (S.R. 2071)/S.R. 2075 (Dolington Road) Intersection	PA	INTERSECTION	
27	Taylorsville Rd. (S.R. 2071) Between S.R. 2075 (Dolington Rd) and PA Route 332 (Afton Ave)	PA	ROADWAY	
28	Taylorsville Rd. (S.R. 2071)/PA Route 332 (Afton Ave) Intersection	PA	INTERSECTION	
29	Taylorsville Rd. (S.R. 2071) From PA Route 332 (Afton Ave) and S.R. 2032 (Reading Ave)	PA	ROADWAY	
30	S.R. 2071 (Pine Grove Rd.)/S.R. 2073 (Yardley-Morrisville Rd.) Intersection	PA	INTERSECTION	
31	S.R. 2071 (Pine Grove Rd.) Between S.R. 2073 (Yardley-Morrisville Rd) and S.R. 2024 (Big Oak Rd) Intersections	PA	ROADWAY	
32	S.R. 2071 (Pine Grove Rd.)/S.R. 2024 (Big Oak Rd.) Intersection	PA	INTERSECTION	
33	S.R. 2071 (Pine Grove Rd.) Between S.R. 2024 (Big Oak Rd) and S.R. 2026 (Trenton Ave)	PA	ROADWAY	
34	S.R. 2071 (Pine Grove Rd.)/S.R. 2026 (Trenton Ave.) Intersection	PA	INTERSECTION	
35	S.R. 2071 (Pine Grove Rd.) Between S.R. 2026 (Trenton Ave) and U.S. Route 1	PA	ROADWAY	
36	Taylorsville Rd. (S.R. 2071) Between Route 532 (Washington Crossing Rd) and Route 32 (River Rd)	PA	ROADWAY	
37	Lindenhurst Rd. (S.R. 2069) From Route 532 (Washington Crossing Rd) to Route 332 (Yardley Newtown Rd)	PA	ROADWAY	



Pre-Construction Traffic Study for the

Scudder Falls Bridge Replacement Project

No.	Location	STATE	TYPE	
38	River Road (Route 32) From Route 532 (General Washington Memorial Blvd) to Route 179 (Bridge St)	PA	ROADWAY	
39	S.R. 2071 (Pine Grove Rd.) From S.R. 2030 (Edgewood Rd.) to S.R. 2032 (Reading Ave)	PA	ROADWAY	
40	S.R. 2071 (Pine Grove Rd.)/S.R. 2032 (Reading Ave) Intersection	PA	INTERSECTION	
41	S.R. 2071 (Pine Grove Rd.) From S.R. 2030 (Edgewood Rd.) to S.R. 2073 (Yardley- Morrisville Rd)	PA	ROADWAY	
42	Edgewood Rd. (S.R. 2030) From S.R. 2071 (Yardley-Morrisville Rd) to S.R. 2032 (Oxford Valley Rd)	PA	ROADWAY	
43	Yardley Langhorne Pike (S.R. 2049) East of I-95 and West of Edgewood Rd	PA	ROADWAY	
44	Yardley Langhorne Pike (S.R. 2049) East of Edgewood Rd. & West of Rt. 332	PA	ROADWAY	
45	Yardley Morrisville Rd. (S.R. 2073) From S.R. 2071 (Yardley-Morrisville Rd) to S.R. 2026 (Trenton Ave)	PA	ROADWAY	
46	Pennsylvania Ave (S.R. 2073)/Trenton Ave. (S.R. 2026) Intersection	PA	INTERSECTION	
47	Yardley Morrisville Rd. (S.R. 2073) From S.R. 2026 (Trenton Ave) to Route 32 (Lincoln Hwy)	PA	ROADWAY	
48	Pennsylvania Ave (S.R. 2073)/Route 32 (Lincoln Hwy) Intersection	PA	INTERSECTION	
49	Yardley Morrisville Rd. (S.R. 2073) From Route 32 (Lincoln Hwy) to U.S. Route 1	PA	ROADWAY	
50	Trenton Ave. (S.R. 2026) From Route 32 (Lincoln Hwy) to S.R. 2073	PA	ROADWAY	
51	Trenton Ave. (S.R. 2026) From S.R. 2073 (Pennsylvania Ave) to S.R. 2024 (Big Oak Rd.)	PA	ROADWAY	
52	Trenton Ave. (S.R. 2026)/S.R. 2024 (Big Oak Rd.) Intersection	PA	INTERSECTION	
53	Trenton Ave. (S.R. 2026) From S.R. 2024 (Big Oak Rd.) to S.R. 2071 (Pine Grove Rd)	PA	ROADWAY	
54	Big Oak Rd. (S.R. 2024) From S.R. 2071 (Pine Grove Rd) to S.R. 2069 (Stony Hill Rd.)	PA	ROADWAY	
55	Stony Hill Rd (S.R. 2069) From U.S 1 to Big Oak Rd. (S.R. 2024)	PA	ROADWAY	
56	U.S. 1 From U.S. 13 to West Bridge Street (SR 0032)	PA	ROADWAY	
57	U.S. 1 From U.S. 13 to Trenton Avenue (S.R. 2026)	PA	ROADWAY	
58	U.S. 1 West of Stony Hill Rd. (SR 2069) to Oxford Valley Rd. (S.R. 2029)	PA	ROADWAY	
59	U.S. 1 From Oxford Valley Rd. (S.R. 2029) to I-95	PA	ROADWAY	
60	U.S. 1 Interchange with Oxford Valley Rd. (S.R. 2029)			
60.1	U.S. 1 Interchange with Oxford Valley Rd. (S.R. 2029) NB U.S. 1 Off Ramp to Oxford Valley Rd. (S.R. 2029) Both Directions			
60.2	U.S. 1 Interchange with Oxford Valley Rd. (S.R. 2029) NB U.S. 1 On Ramp from Oxford Valley Rd. (S.R. 2029) Both Directions	PA	INTERCHANGE	
60.3	U.S. 1 Interchange with Oxford Valley Rd. (S.R. 2029) SB U.S. 1 Off Ramp to Oxford Valley Rd. (S.R. 2029) Both Directions	•		
60.4	U.S. 1 Interchange with Oxford Valley Rd. (S.R. 2029) SB U.S. 1 On Ramp from Oxford Valley Rd. (S.R. 2029) Both Directions			
61	Route 332 (Yardley Newtown Rd) From I-95 to Mirror Lake Rd. (S.R. 2087)	PA	ROADWAY	
62	Route 332 (Yardley Newtown Rd) From Mirror Lake Rd. (S.R. 2087) to S.R. 2049 (Langhorne Yardley Rd)	PA	ROADWAY	
63	Route 332 (Afton Ave) From S.R. 2049 (Yardley Langhorne Rd) to S.R. 2071 (Main St)	PA	ROADWAY	



Pre-Construction Traffic Study for the

Scudder Falls Bridge Replacement Project

No.	Location	STATE	TYPE
64	U.S. 1/Oxford Valley Rd. (S.R. 2029) Intersection	PA	INTERSECTION
65	Oxford Valley Rd. (S.R. 2029) From U.S. 1 to Big Oak Rd. (S.R. 2024)	PA	ROADWAY
66	Oxford Valley Rd. (S.R. 2029)/Big Oak Rd. (S.R. 2024) Intersection	PA	INTERSECTION
67	Oxford Valley Rd. (S.R. 2029) From Big Oak Rd. (S.R. 2024) to S.R. 2069 (Stony Hill Rd)	PA	ROADWAY
68	Bristol Oxford Valley Rd. (S.R. 2029) From U.S. 1 to Lincoln Hwy. (S.R. 2037)	PA	ROADWAY
69	Bristol Oxford Valley Rd. (S.R. 2029) From Lincoln Hwy. (SR 2037) to Trenton Rd. (SR 2018)	PA	ROADWAY
70	Bristol Oxford Valley Rd. (S.R. 2029) South of Woodbourne Rd. (S.R. 2033)	PA	ROADWAY
71.1	Lower Ferry Rd/Reed Rd (CR 643) from CR 546 (Washington Crossing Pennington Rd) to Upper Ferry Rd (CR 636)	NJ	ROADWAY
71.2	Ingleside Avenue (CR 631) from CR 546 (Washington Crossing Pennington Rd) to Rt 31 (Pennington Rd)	NJ	ROADWAY
72	Upper Ferry Road (CR 636) From Lower Ferry Road (CR 643) to Route 31 (Pennington Road)	NJ	ROADWAY
73	Calhoun Street From Route 29 (River Rd) to West State Street	NJ	ROADWAY
74	West State Street From Calhoun Street to N. Warren Street (US 206)	NJ	ROADWAY
75	CR 546 (Washington Crossing Pennington Rd) From Route 29 (River Rd) to Bear Tavern Road (CR 579)	NJ	ROADWAY
76	CR 546 (Washington Crossing Pennington Rd/Bear Tavern Road (CR 579) Intersection	NJ	INTERSECTION
77	CR 546 (Washington Crossing Pennington Rd) From Bear Tavern Road (CR 579) to Jacobs Creek Road (CR 637)	NJ	ROADWAY
78	CR 546 (Washington Crossing Pennington Rd)/Jacobs Creek Road (CR 637) Intersection	NJ	INTERSECTION
79	CR 546 (Washington Crossing Pennington Rd) From Jacobs Creek (CR 637) Road to Scotch Road (CR 611)	NJ	ROADWAY
80	CR 546 (Washington Crossing Pennington Rd)/Scotch Road (CR 611) Intersection	NJ	INTERSECTION
81	NJ Route 29 (River Rd) From S. Warren Street to Calhoun Street	NJ	ROADWAY
82	NJ Route 29 (River Rd) From Calhoun Street to Parkside Avenue (CR 636)	NJ	ROADWAY
83	NJ Route 29 (River Rd) From Parkside Avenue (CR 636) to Sullivan Way (CR 579)	NJ	ROADWAY
84	NJ Route 29 (River Rd) From Sullivan Way (CR 579) to Lower Ferry Road (CR 643)	NJ	ROADWAY
85	NJ Route 29 (River Rd) From Lower Ferry Road (CR 643) to Wilburtha Road	NJ	ROADWAY
86	NJ Route 29 (River Rd) From Wilburtha Road to W. Upper Ferry Road (NJ 175)	NJ	ROADWAY
87	NJ Route 29 (River Rd) From W. Upper Ferry Road (NJ 175) to I-95	NJ	ROADWAY
88	NJ Route 29 (River Rd) From I-95 to Jacobs Creek Road (CR 637)	NJ	ROADWAY
89	NJ Route 29 (River Rd) From Jacobs Creek Road (CR 637) to CR 546 (Washington Crossing Pennington Rd)	NJ	ROADWAY
90	Bear Tavern Road (CR 579) From CR 546 (Washington Crossing Pennington Rd) to Jacobs Creek Road (CR 637)	NJ	ROADWAY
91	Bear Tavern Road (CR 579) From Jacobs Creek Road (CR 637) to I-95	NJ	ROADWAY
92	Scotch Road (CR 611) From CR 546 (Washington Crossing Pennington Rd) to I-95	NJ	ROADWAY





TRAFFIC STUDY FOR SCUDDER FALLS BRIDGE

DRJTBC PRE-CONSTRUCTION



XX

MAX. V/C RATIO ≥0.75

MAX. V/C RATIO V/C <0.75

- LEGEND

- N.T.S.



FIGURE 1

OVERVIEW MAP - 1

SHT. 1 OF 4



XX

TRAFFIC STUDY FOR SCUDDER FALLS BRIDGE

DRJTBC PRE-CONSTRUCTION



FIGURE 1



OVERVIEW MAP - 2

SHT. 2 OF 4



TRAFFIC STUDY FOR SCUDDER FALLS BRIDGE

DRJTBC PRE-CONSTRUCTION



OVERV

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$ \begin{array}{c} \hline \\ \hline $	X. V/C RATIO V/C <0.75 RECTION AM (PM) LUME/CAPACITY RATIO
FIGURE 1 'ERVIEW MAP - 3	SHT. 3 OF 4





3. Data Collection

The data collection for the project started the week of October 4th, 2015 in order to have traffic patterns return to normal following the Papal visit to Philadelphia on September 26th and 27th, 2015. The data collection for this project included Manual Turning Movement (MTM) counts and Automatic Traffic Recorder (ATR) counts at the study area locations.

Manual Turning Movement Counts

Manual turning movement (MTM) counts, including classification of heavy vehicles, pedestrian counts, bicycles and right turns on red were conducted on an average weekday (Tuesday/Wednesday/Thursday) during the morning peak period between 6:00 AM to 10:00 AM and during the afternoon peak period between 4:00 PM to 7:00 PM at the study intersections defined in **Table 1**. The scope of work also included analysis of urban street segments. In order to perform these analyses, turning movement counts are required at the boundary intersections. Therefore, additional turning movement counts were conducted during the morning period (7:00 AM to 9:00 AM) and during the afternoon period (4:30 PM to 6:30 PM) at the additional intersections defined in **Table 2**.

No.	Location	STATE	TYPE
94	Edgewood Rd. (S.R. 2030) & Oxford Valley Rd. (S.R. 2029)	PA	INTERSECTION
95	Edgewood Rd. (S.R. 2030) & Makefield Rd.	PA	INTERSECTION
96	Lower Ferry Rd (CR 643) & Upper Ferry Rd (CR 636)	NJ	INTERSECTION
97	Upper Ferry Rd (CR 636) & Route 31	NJ	INTERSECTION
98	Calhoun St (CR 653) & W State St	NJ	INTERSECTION
99	W State St & Willow St	NJ	INTERSECTION
100	W State St & Warren St (US 206)	NJ	INTERSECTION

Table 2: Additional Turning Movement Count Locations

Automatic Traffic Recorder Counts

Automatic Traffic Recorder (ATR) counts, including FHWA 13 category scheme, were conducted for a period of a minimum period of one week at the study area segments listed on **Table 1**. AM and PM peak hour traffic volumes were calculated from the one week of segment data. AM peak hour volume is the highest hour count volume in the AM, consisting of four consecutive 15 minute periods that fall between midnight and noon, PM peak hour is the highest count volume in the PM, consisting of four consecutive 15 minute periods that fall between midnight and noon, PM peak hour is the highest count volume in the PM, consisting of four consecutive 15 minute periods that fall between noon and midnight. The scope of work included traffic counts on sites along limited access highways such as I-95 and US 1. These sites are heavily travelled roadways with an average daily traffic volume of approximately 60,000 vehicles. Due to the characteristics of these areas, such as multiple lanes, limited median space, the lack of permanent structures to affix the ATR machine, and the risk of tubes not staying in place due to the high-speed traffic, non-intrusive traffic data collection using MIOVISION video detection cameras were used. Unlike ATRs, the video counters group vehicles into 6 classification categories.

A review of the existing study intersections, interchanges, bridges and roadway facilities were conducted. A sketch is provided at each study location where traffic counts were conducted. The documentation includes, but is not limited to, the number of lanes, lane widths, shoulder dimensions, grade, passing/no-passing zones, posted speed limits, turning movements, turning lanes, and intersection/interchange lay-out. Signal plans were obtained from NJDOT, PennDOT, and associated municipalities.



4. Capacity Analysis Methodology

Intersections Analysis

Intersection operations were assessed according to the methodologies contained in the 2010 Highway Capacity Manual (HCM) using Synchro software (Version 9.1, Build 904, Revision 125). Traffic models were calibrated using the procedure developed in PennDOT Publication 46, Chapter 10, and the traffic data collected as part of the study.

Segments Analysis

Traffic analysis for the study segments listed in **Table 1** was performed according to the methodologies contained in the 2010 HCM using Highway Capacity Software (HCS) 2010 Version 6.7.

5. Existing Conditions Assessment

Intersections Analysis

Capacity analyses were performed using Synchro Version 9.1 (Build 904, Revision 125) to determine the capacity of the study intersections listed in **Table 1**. Due to the limitations in the HCM 2010 methodology (i.e., semi-actuated controllers, advance detection, shared and exclusive lane approaches not supported), the results for the intersections not supported by HCM 2010 were analyzed based on Synchro methodologies. Capacity analyses results at the study area intersections for the existing weekday AM and PM peak hours are summarized in **Table 3**. Any intersection movement operating at a V/C ratio of 0.75 or above are highlighted in **Table 3** and on **Figure 1**.

	Intersection		AM Peak Hour			PM Peak Hour			
Intersection #		Direction	Delay (Secs)	LOS	V/C	Delay (Secs)	LOS	v/c	
		EB Approach	15.8	С	0.559	11.6	В	0.329	
	PA Route 532 (General Washington	WB Approach	9.4	А	0.140	43.1	E	0.943	
2	Memorial Blvd) &PA Route 32	NB Approach	10.3	В	0.257	11.5	В	0.222	
	(Unsignalized)	SB Approach	11.2	В	0.324	4.5	А	0.246	
		Overall	12.8	В	-	30.3	D	-	
	NJ Route 29 & NJ Route 546 (Washington Crossing Pennington Road) (Signalized)*	EB Approach	62.6	E	0.91	41.9	D	0.72	
		WB Approach	44.2	D	-	45.1	D	-	
		WB Left	57.0	E	0.67	35.0	D	0.47	
3		WB Thru/Right	22.0	С	0.10	47.2	D	0.86	
		NB Approach	35.1	D	0.63	78.1	F	1.07	
		SB Approach	71.9	E	1.04	16.1	В	0.54	
		Overall	59.3	E	-	52.6	D	0.78	
		EB Approach	34.2	С	-	6.3	А	-	
	N. Delmorr Avenue & E Trenton	EB Thru/Left	34.4	С	0.94	6.5	А	0.38	
6	Avenue/Calhoun Street Bridge	EB Right	7.9	А	0.01	4.5	А	0.05	
	(Signalized)	WB Approach	11.0	В	0.36	16.2	В	0.69	

Table 3: Level of Service Summary (Intersections)



Pre-Construction Traffic Study for the Scudder Falls Bridge Replacement Project

			AM Peak Hour			PM Peak Hour			
Intersection #	Intersection	Direction	Delay (Secs)	LOS	v/c	Delay (Secs)	LOS	V/C	
		NB Approach	22.7	С	0.54	25.4	С	0.62	
		SB Approach	63.5	Е	0.85	23.8	С	0.49	
		Overall	33.5	С	0.51	15.9	В	0.37	
		EB Approach	4.4	А	-	4.3	Α	-	
		EB Left	6.2	А	0.15	7.9	Α	0.11	
		EB Thru/Right	4.0	А	0.27	3.0	А	0.10	
	Delmorr Avenue & Bridge Street	WB Approach	4.4	А	-	4.9	А	-	
9	(Signalized)	WB Left	4.7	Α	0.10	3.7	A	0.16	
		WB Thru	4.6	A	0.36	5.6	A	0.51	
		WB Right	3.0	А	0.06	3.5	А	0.20	
		NB Approach	25.0	С	0.28	30.2	С	0.34	
		SB Approach	27.2	С	0.48	32.6	С	0.54	
		Overall	8.4	Α	0.23	9.2	Α	0.23	
	I-95 NB Off Ramp & Yardley Newtown Road (Signalized)**	EB Approach	39.6	D	0.19	28.5	С	0.27	
		WB Approach	30.6	С	0.30	25.1	С	0.18	
14A		NB Approach	21.4	С	-	22.3	С	-	
		NB Left	24.2	C	0.75	25.3	C	0.71	
			1.9	A	0.20	9.1	A	0.31	
			25.4		-	17.0		-	
		EB Approach	11.1	В	-	17.9	В	-	
	Vardlay Noutown Road & LOE SP. Off	EB Right	10.8	B	0.43	8.4	A	0.35	
		WB Approach	12.5	B	-	9.9	A	-	
14B	Ramp (Signalized)**	WB Left	80.4	F	0.86	99.8	F	0.79	
		WB Thru	3.9	А	0.53	1.5	А	0.44	
		SB Left	56.6	E	0.22	91.7	F	0.81	
		SB Right	607.4	F	2.28	1017.8	F	3.21	
		Overall	90.8	F	-	203.0	F	-	
		EB Approach	6.9	A	-	5.6	А	-	
		EB Left	7.0	A	0.44	8.1	A	0.51	
19	I-95 NB Off Ramp/I-95 NB On Ramp	EB Ihru WB	6.8 11.2	A B	- 0.49	4.1 11.3	A B	- 0.35	
		WB Thru	11.2	В	0.31	11.3	В	0.63	
		WB Right	0.0	A	0.00	0.0	A	0.00	
		NB Approach	42.7	D	-	31.9	С	-	



Pre-Construction Traffic Study for the Scudder Falls Bridge Replacement Project

		AM Peak Hour		PM Peak Hour				
Intersection #	Intersection	Direction	Delay (Secs)	LOS	v/c	Delay (Secs)	LOS	V/C
		NB Thru/Left	42.7	D	0.87	31.9	С	0.80
		NB Right	0.0	Α	0.00	0.0	Α	0.00
		Overall	15.0	В	0.47	11.2	В	0.50
		EB Approach	400.3	F	-	18.8	С	-
		EB Thru/Left	531.6	F	2.04	33.2	D	0.26
	Main Street/Taylorsville Poad &	EB Right	10.0	Α	0.15	12.5	В	0.18
26	Dolington Road/McKinley Avenue (Unsignalized)	WB Approach	17.5	С	0.03	18.6	С	0.04
	(NB Approach	0.6	А	0.05	3.8	А	0.01
		SB Approach	0.3	A	0.01	0.1	А	0.00
		Overall	123.9	F	-	3.9	A	-
	Main Street & Afton Avenue (Signalized)	EB Approach	34.8	С	0.77	30.8	С	0.73
		Approach	24.5	С	0.34	26.4	С	0.50
		NB Aproach	12.1	В	-	8.0	А	-
		NB Left	10.8	В	0.19	9.3	А	0.19
28		NB Thru/Right	12.3	В	0.52	7.7	А	0.32
		SB Approach	16.8	В	-	15.4	В	-
		SB Left	16.3	В	0.10	10.9	В	0.11
		SB Thru/Right	16.8	В	0.41	16.0	В	0.54
		Overall	20.0	В	0.41	18.3	В	0.39
		WB Approach	45.9	D	-	54.5	D	0
		WB Left	45.9	D	0.43	54.5	D	0
		WB Right	0.0	A	0.00	0.0	A	0
	Pine Grove Road & Yardlev	NB Approach	19.0	В	-	17.0	В	-
30	, Morrisville Road (Signalized)	Thru/Right	19.0	В	0.42	17.0	В	0.44
		SB Approach	2.3	A	-	2.0	A	-
		SB Left	3.0	A	0.31	3.1	A	0.16
		SB Thru	1.3	A	0.17	1.6	A	0.25
		Overall	8.7	A	0.27	10.0	A	0.28
		EB Approach WB Approach	8.2	A	0.44	12.4	B	0.38
32	rine Grove Koad & Big Oak Koad (Signalized)	NB Approach	14.2	В	0.54	14.2	В	0.63
	(SiBrianzed)	SB Approach	13.0	В	0.45	12.1	В	0.46
		Overall	12.0	B	0.39	12.9	B	0.45
	Pine Grove Road & Trenton	EB Approach	16.5	В	-	24.5	С	-
34	Avenue(Signalized)	EB Left	12.7	В	0.10	18.7	В	0.15



Pre-Construction Traffic Study for the Scudder Falls Bridge Replacement Project

			AM	AM Peak Hour		PM P	eak Ho	ur
Intersection #	Intersection	Direction	Delay (Secs)	LOS	v/c	Delay (Secs)	LOS	v/c
		EB Thru	17.0	В	0.30	25.3	С	0.45
		EB Right	0.0	Α	0.00	0.0	А	0.00
		WB Approach	13.3	В	-	19.3	В	-
		WB Left	12.1	В	0.25	17.9	В	0.61
		WB Thru	14.1	В	0.15	20.0	В	0.42
		WB Right	0.0	А	0.00	0.0	А	0.00
		NB Approach	29.6	С	-	31.9	С	-
		NB Left	23.5	С	0.22	20.8	С	0.33
		NB Thru	30.9	С	0.69	36.1	D	0.79
		NB Right	0.0	А	0.00	0.0	А	0.00
		SB Approach	30.5	С	-	25.8	С	-
		SB Left	23.5	С	0.18	21.6	С	0.43
		SB Thru	31.6	С	0.73	28.2	С	0.59
		SB Right	0.0	А	0.00	0.0	А	0.00
		Overall	21.7	С	0.28	24.3	С	0.47
		EB Approach	29.8	D	0.54	25.2	D	0.43
40	Main Street & Reading Avenue	NB Approach	0.7	А	0.05	1.0	А	0.06
40	(Unsignalized)	SB Approach	0.0	А	0.00	0.0	А	0.00
		Overall	4.7	Α	-	3.5	Α	-
		EB Approach	48.0	D	0.75	15.5	В	0.21
		WB Approach	16.1	В	-	18.2	В	-
		WB Left	16.0	В	0.17	19.2	В	0.46
		WB Thru/Right	16.1	В	0.25	17.0	В	0.35
46	Pennsylvania Avenue & Trenton	NB Approach	35.9	D	-	26.6	С	-
40	Avenue (Signalized)	NB Left	16.9	В	0.02	16.1	В	0.02
		NB Thru/Right	36.2	D	0.88	26.7	С	0.75
		SB Approach	10.8	В	-	13.9	В	-
		SB Left	12.7	В	0.18	11.1	В	0.15
		SB Thru/Right	10.2	В	0.21	14.2	В	0.60
		Overall	32.0	С	0.52	18.8	В	0.40
		EB Approach	16.1	В	-	12.6	В	-
		EB Left	14.6	В	0.24	14.4	В	0.25
	Pennsylvania Avenue & Bridge Street	EB Thru	17.5	В	0.44	12.4	В	0.19
48	(Signalized)*	EB Right	13.6	В	0.19	11.3	В	0.11
		WB Approach	26.6	С	0.72	27.3	С	0.81
		NB Approach	25.2	C	-	273	C	_



Pre-Construction Traffic Study for the Scudder Falls Bridge Replacement Project

			AM Peak Hour		PM Peak Hour			
Intersection #	Intersection	Direction	Delay (Secs)	LOS	v/c	Delay (Secs)	LOS	v/c
		NB Left	30.0	С	0.34	28.7	С	0.48
		NB Thru/Right	22.8	С	0.22	26.7	С	0.56
		SB Approach	30.2	С	-	22.9	С	-
		SB Left	22.7	С	0.12	21.4	С	0.14
		SB Thru/Right	31.1	С	0.65	23.0	С	0.48
		Overall	23.9	С	-	24.0	C	-
		EB Approach	8.5	Α	0.53	8.1	А	0.53
		WB Approach	6.7	А	0.36	12.9	В	0.75
F-2	Driveway/Big Oak Road & Trenton	NB Approach	21.1	С	0.17	26.8	С	0.28
52	Avenue (Signalized)	SB Approach	24.7	С	-	30.0	С	-
		SB Thru/Left	25.1	С	0.53	31.1	С	0.54
		SB Right	19.8	В	0.04	25.2	С	0.12
		Overall	10.8	В	0.39	13.3	В	0.53
	Oxford Valley Road & Rt. 1 On Ramp/Rt. 1 Off Ramp (Signalized)***	WB Approach	35.4	D	-	59.1	E	-
		WB Left	52.4	D	0.57	45.7	D	0.62
		WB Thru/Left	52.1	D	0.57	45.7	D	0.62
		WB Right	11.5	B	0.49	74.2	E	1.00
60.1		NB Approach	17.9	В	-	26.5	C	-
			47.4		0.84	50.6 12.6	P	0.88
		SB Annroach	3.7 12.5	R	- 0.45	23.0		
		SB Thru	14.7	B	0.27	29.8	C	0.65
		SB Right	10.5	B	0.72	8.7	A	0.60
		Overall	18.0	B	-	31.9	C	-
		EB Approach	104.6	F	-	107.1	F	-
		EB Left	35.9	D	0.41	40.4	D	0.64
		EB Thru/Left	35.9	D	0.41	40.4	D	0.64
		EB Right	133.6	F	1.21	164.3	F	1.27
		NB Approach	26.0	С	-	21.2	С	-
60.2	UXTORG VAILEY KOAG & Kt. 1 Uff Ramp/Rt 1 On Ramp (Signalized)***	NB Thru	29.2	С	0.54	25.7	С	0.76
		NB Right	9.5	A	0.27	3.8	A	0.45
		SB Approach	10.9	B	-	18.3	B	-
		SB Left	29.2	<u> </u>	0.79	/3.2	E	0.84
		SB Ihru	3.2	A	0.34	11.8	В	0.66
		Overall	48.2	D	-	44.5	D	-
		EB Approach	44.8		-	//./	E	-
64	UXTORD Valley Road & Lincoln Highway (Signalized)	EB LETT	207		0.76	83.3 74.6		1.00
	Hignway (Signalized)	FB Right	0.0	Δ	0.59	0.0	Δ	0.28
		LD MBIIL	0.0		0.17	0.0		0.20



Pre-Construction Traffic Study for the Scudder Falls Bridge Replacement Project

			AM	Peak H	our	PM P	eak Ho	ur
Intersection #	Intersection	Direction	Delay (Secs)	LOS	v/c	Delay (Secs)	LOS	v/c
		WB	145.0	-		76.0	_	
		Approach	145.0	F	-	/6.0	E	-
		WB Left	299.1	F	1.14	104.1	F	1.02
		WB Thru	40.6	D	0.56	55.7	E	0.84
		WB Right	0.0	Α	0.63	0.0	А	1.67
		NB Approach	44.9	D	-	50.1	D	-
		NB Left	55.9	E	0.62	56.8	E	0.68
		NB Thru	42.7	D	0.76	48.6	D	0.85
		NB Right	0.0	Α	0.59	0.0	А	0.77
		SB Approach	38.2	D	-	57.9	E	-
		SB Left	54.3	D	0.89	102.4	F	1.07
		SB Thru	28.7	С	0.53	35.2	D	0.62
		SB Right	0.0	А	0.21	0.0	А	0.14
		Overall	64.1	Е	0.66	64.4	Ε	0.83
		EB Approach	38.5	D	-	180.3	F	-
		EB Left	51.5	D	0.35	51.8	D	0.54
		EB Thru	46.0	D	0.69	401.5	F	1.74
		EB Right	31.9	С	0.39	41.9	D	0.72
		WB	120	D		40 F	D	
		Approach	42.8	D	-	49.5	D	-
		WB Left	48.7	D	0.57	54.0	D	0.75
		WB Thru	37.6	D	0.34	48.7	D	0.68
	Oxford Valley Road & Big Oak Road	WB Right	31.7	С	0.08	34.6	С	0.23
66	(Signalized)	NB Approach	45.4	D	-	32.7	С	-
		NB Left	78.7	E	0.94	52.0	D	0.72
		NB Thru	24.7	С	0.24	26.7	С	0.22
		NB Right	15.7	В	0.13	15.3	В	0.20
		SB Approach	21.6	С	-	23.1	С	-
		SB Left	55.8	E	0.56	56.4	E	0.61
		SB Thru	16.3	В	0.14	19.8	В	0.32
		SB Right	13.6	В	0.04	13.2	В	0.05
		Overall	39.9	D	0.27	80.8	F	0.39
		EB Approach	23.3	С	-	16.4	В	-
		EB Left	13.4	В	0.26	16.2	В	0.42
		EB Thru/Right	26.7	С	0.80	16.6	В	0.18
76	Bear Tavern Road & NJ 546	WB Approach	17.9	В	-	25.9	С	-
	(Signalized)	WB Left	16.8	В	0.27	15.5	В	0.05
		WB Thru	18.7	В	0.13	25.3	С	0.73
		WB Right	18.7	В	0.13	27.4	С	0.77
		NB Approach	24.0	С	-	27.9	С	-
		NBLeft	19.7	В	0.05	16.3	В	0.33



Pre-Construction Traffic Study for the Scudder Falls Bridge Replacement Project

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			AM	Peak H	our	PM P	eak Ho	ur
Intersection #	Intersection	Direction	Delay (Secs)	LOS	v/c	Delay (Secs)	LOS	v/c
		NB Thru/Right	24.3	С	0.44	31.3	С	0.81
		SB Approach	19.5	В	-	22.1	С	-
		SB Left	18.8	В	0.66	17.9	В	0.28
		SB Thru	20.9	С	0.62	23.8	С	0.58
		SB Right	16.2	В	0.18	20.6	С	0.24
		Overall	21.0	С	0.38	24.4	С	0.44
		EB Approach	4.8	А	0.51	2.6	Α	0.16
78	Jacobs Creek Road & NJ 546	WB Approach	3.0	А	0.23 7.7	А	0.71	
	(Signalized)	NB Approach	35.3	D	0.57	35.2	D	0.54
		Overall	6.7	Α	0.39	8.4	Α	0.44
		EB Approach	14.6	В	-	24.1	С	-
		EB Left	14.1	В	0.12	34.1	С	0.35
		EB Thru	15.0	В	0.23	19.3	В	0.23
		EB Right	13.4	В	0.06	17.2	В	0.03
		WB Approach	10.9	В	-	24.4	С	-
		WB Left	10.1	В	0.12	13.4	В	0.15
		WB Thru/Right	11.2	В	0.21	26.0	С	0.75
80	Scotch Road & NJ 546 (Signalized)	NB Approach	15.7	В	-	15.6	В	-
		NB Left	15.5	В	0.27	16.5	В	0.60
		NB Thru	16.0	В	0.31	14.9	В	0.34
		NB Right	14.5	В	0.05	13.2	В	0.08
		SB Approach	22.1	С	-	26.2	С	-
		SB Left	21.0	С	0.05	25.0	С	0.07
		SB Thru	22.5	С	0.33	26.7	С	0.37
		SB Right	21.6	С	0.17	25.5	C	0.17
		Overall	15.7	В	0.18	21.2	C	0.31

* HCM 2010 not applicable due to protected-permissive phasing in a shared left-turn lane. Intersection 3 has protected-permissive phasing during the AM peak hour only. Synchro 9 analysis criteria used as a replacement for HCM 2010.

** HCM 2010 does not support Non-NEMA phasing. Synchro 9 analysis criteria used as a replacement for HCM 2010.

*** HCM 2010 computation does not support turning movement with shared and exclusive lanes. Synchro 9 analysis criteria used as replacement for HCM 2010.



Capacity analyses were performed using Highway Capacity Software (HCS) 2010 Version 6.7 to determine the levels of service (LOS) and V/C ratio of the study area freeway segments for the existing AM and PM peak hour traffic volumes. These results are summarized in **Table 4.** Freeway segments operating at a V/C ratio of 0.75 or above are highlighted in **Table 4** and **Figure 1**.

							Existing 201	5 Traffic Cond	litions				
					AM Peak					PM Peak			
#	Segment	Dir.	Demand Flow (pc/ln/hr)	Speed (mph)	Capacity (pc/hr/lane)	v/c	Density (pc/mi/ln)	Demand Flow (pc/ln/hr)	Speed (mph)	Capacity (pc/hr/lane)	v/c	LOS	Densiity (pc/mi/ln)
	I-95 from Rt. 1 to Rt.	NB	1799	72	2400	0.75	27.3	1503	72	2400	0.63	С	21.8
13	332	SB	1264	72	2400	0.53	18.1	2083	72	2400	0.87	D	34.2
	I-95 from Rt. 332 to	NB	1594	70	2400	0.66	23.4	1054	70	2400	0.44	В	15.1
15	Taylorsville Rd	SB	952	70	2400	0.40	13.6	1858	70	2400	0.77	D	28.6
	I-95 from NJ 29 to	NB	1527	70	2400	0.64	22.2	608	70	2400	0.25	А	8.7
18	Bear Tavern Rd	SB	621	70	2400	0.26	8.9	1519	70	2400	0.63	С	22.1
	I-95 from Bear	NB	1481	69	2400	0.62	21.4	692	69	2400	0.29	А	9.9
20	Tavern Rd to Scotch Rd	SB	736	68	2400	0.31	10.5	1419	68	2400	0.59	с	20.4
	Route 1 from US 13	NB	2338	68	2400	0.97	42.5	1550	68	2400	0.65	С	22.6
56	to West Bridge St	SB	763	69	2400	0.32	10.9	1421	69	2400	0.59	С	20.5
	Route 1 from Route	NB	1837	70	2400	0.77	28.1	1377	70	2400	0.57	С	19.8
57	13 to Trenton Avenue	SB	879	69	2400	0.37	12.6	1567	69	2400	0.65	с	22.9
	Route 1 from Stony	NB	1761	70	2400	0.73	26.5	1371	70	2400	0.57	С	19.7
58	Hill Rd to SR 2029	SB	1216	70	2400	0.51	17.4	1763	70	2400	0.73	D	26.6
	Route 1 from SR	NB	2070	70	2400	0.86	33.8	1751	70	2400	0.73	D	26.3
59	2029 to I-95	SB	1574	71	2400	0.66	23.0	2286	71	2400	0.95	E	40.6

Table 4: Level of Service Summary (Freeway Segments)



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Ramp Capacity Analysis

Capacity analyses were performed using Highway Capacity Software (HCS) 2010 Version 6.7 to determine the levels of service (LOS) and Density of the study ramps and weave sections for the existing AM and PM peak hour traffic volumes. These results are summarized in **Table 5.** Ramps and weave sections operating at LOS E or worse are highlighted in **Table 5** and **Figure 1**.

		Morgo	linstroom /	A	M Peak	P	PM Peak	
Loc.	Ramp	Diverge/	Downstream	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	
	7.1 NB NJ Route 29 Off Ramp to EB Calhoun Street	Diverge	Downstream	D	31.7	В	16.3	
	7.2 NB NJ Route 29 On Ramp from EB Calhoun	Merge	Downstream	D	29.6	В	14.9	
	Street	Merge	Upstream	С	28.0	В	14.9	
	7.3 NB NJ Route 29 Off Ramp to WB Calhoun	Diverge	Downstream	D	28.7	В	16.8	
	Street	Diverge	Upstream	D	28.7	В	14.5	
	7.4 NB NJ Route 29 On Ramp from WB Calhoun Street	Merge	Upstream	с	26.9	В	13.5	
	7.5 SB NJ Route 29 Off Ramp to EB Calhoun	Diverge	Downstream	С	22.8	С	23.4	
7	Street	Diverge	Upstream	С	25.5	С	26.1	
	7.6 SB NJ Route 29 On Ramp from EB Calhoun Street	Merge	Upstream	D	28.6	С	27.4	
	7.7 SB NJ Route 29 Off Ramp to WB Calhoun Street	Diverge	Downstream	с	25.4	С	24.3	
	7.8 SB NJ Route 29 On Ramp from WB Calhoun	Merge	Downstream	С	26.0	С	27.7	
	Street	Merge	Upstream	С	26.0	С	27.7	
	NJ Route 29 NB	Weave	NA	В	17.8	А	9.3	
	NJ Route 29 SB	Weave	NA	В	18.3	В	18.8	
		Diverge	Downstream	E	38.8	D	32.4	
	11.1 NB I-95 Off Ramp to US 1 NB	Merge	Downstream	D	32.3	D	28.0	
		Merge	Upstream	D	32.3	D	28.0	
		Diverge	Downstream	D	29.2	С	24.4	
	11.2 NB I-95 Off Ramp to US 1 SB	Diverge	Upstream	D	29.2	С	24.4	
		Merge	Downstream	С	23.4	E	35.3	
11		Merge	Upstream	С	23.4	E	35.3	
		Diverge	Downstream	С	27.7	C	23.1	
	11.3 NB I-95 On Ramp from US 1 NB	Diverge	Upstream	С	23.1	С	24.7	
		Merge	Downstream	E	35.5	D	29.2	
		Merge	Upstream	E	35.5	D	29.2	
		Diverge	Downstream	В	17.8	D	30.1	
	11.4 NB I-95 On Ramp from US 1 SB	Diverge	Upstream	В	17.8	D	30.1	
		Merge	Upstream	D	29.5	С	24.9	

Table 5: Level of Service Summary (Ramps)



Executive Summary: Pre-Construction Traffic Study for the

Scudder Falls Bridge Replacement Project

		Margal	lerge/ Upstream/ iverge Downstream LOS Density (pc/mi/ln) LOS (pc/mi/ln)	PM Peak			
Loc.	Ramp	Diverge/	Downstream/	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
		Diverge	Downstream	С	21.1	E	35.7
	11 E SP LOE Off Pamp to US 1 NP	Diverge	Upstream	С	21.1	E	35.7
		Merge	Downstream	D	29.4	С	24.8
Loc. 11.5 11.5 11.6 11.7 11.6 11.7		Merge	Upstream	D	29.4	С	24.8
	11 6 SP L OF Off Pamp to US 1 SP	Diverge	Downstream	В	19.9	D	34.0
	11.0 36 1-35 Off Kallip to 03 1 36	Merge	Upstream	С	21.6	D	31.4
	11 7 SP L OF On Pamp from US 1 NP	Diverge	Downstream	С	27.4	С	23.7
	11.7 36 1-95 OII Kamp Irom 05 1 NB	Merge	Upstream	С	22.1	D	33.8
		Diverge	Downstream	С	21.3	D	34.4
	11 8 SP I OF On Pamp from US 1 SP	Diverge	Upstream	С	21.3	D	34.4
	11.0 28 1 20 HINH HUH HO 1 28	Merge	Downstream	С	21.9	E	35.2
		Merge	Upstream	С	21.9	E	35.2
	I-95 NB	Weave	NA	E	39.2	D	29.2
	I-95 SB	Weave	NA	С	21.7	E	40.7
	US Route 1 NB	Weave	NA	D	28.4	F	43.2
	US Route 1 SB	Weave	NA	С	26.0	С	24.9
	12.1 NB I-95 Off Ramp to Both Directions US 1	Diverge	Downstream	D	31.3	С	23.9
		Diverge	Downstream	В	15.0	D	33.3
	12.2 NP LOE On Pamp from LIS 1 SP	Diverge	Upstream	В	15.0	D	33.3
	12.2 NB 1-95 On Kamp 11011 05 1 5B	Merge	Downstream	D	28.8	В	19.4
		Merge	Upstream	D	28.8	В	19.4
	12.2 NP LOE On Pamp from US 1 NP	Diverge	Downstream	С	23.1	В	15.5
	12.5 NB 1-95 OII Kallip Holli 05 1 NB	Merge	Upstream	D	30.5	С	20.1
12	12 4 SB 1-95 Off Ramp to US 1 SB	Diverge	Downstream	В	10.2	Α	3.4
12		Merge	Upstream	F	25.6	Α	-2.5
		Diverge	Downstream	С	22.9	В	14.1
	12.6 SP LOE On Pamp from US 1 NP	Diverge	Upstream	С	22.0	В	13.7
	12.0 20 1.00 HOULD TO T NB	Merge	Downstream	В	14.4	С	24.0
		Merge	Upstream	В	13.5	С	21.0
	12 7 SB 1-95 On Ramp from LIS 1 SP	Diverge	Downstream	В	18.2	В	10.3
		Merge	Upstream	F	43.5	D	34.7
	12.8 SB US 1 on Ramp from I-95 NB	Merge	Upstream	В	10.9	С	20.1
14	14.1 NB I-95 Off Ramp to PA Route 332 Both Directions	Diverge	Downstream	С	21.7	В	16.6
	14.2 NR LOS Off Pamp to DA Pouto 222 EP	Merge	Downstream	С	24.4	В	14.9
	14.2 NO 1-95 OIL RAINP LO PA ROULE 532 EB	Merge	Upstream	С	24.0	В	14.9



		Morgo	Unstroom/	А	M Peak	P	PM Peak
Loc.	Ramp	Diverge	Downstream	LOS	Density (pc/mi/ln)	LOS B D D B B B C D C D C B C A A A A A A C C B C B C B C C C	Density (pc/mi/ln)
	14.3 NB I-95 On Ramp from PA Route 332 WB	Merge	Upstream	С	24.7	В	16.2
	14.4 SB I-95 Off Ramp to PA Route 332 Both Directions	Diverge	Downstream	В	14.4	D	30.0
	14.5 SB I-95 On Ramp from PA Route 332 Both Directions	Merge	Upstream	В	18.8	D	34.4
	16.1 NB I-95 Off Ramp to Taylorsville Road Both Directions	Diverge	Downstream	С	25.9	В	16.6
	16.2 NB I-95 On Ramp from Taylorsville Road	Merge	Downstream	D	33.9	В	19.2
	EB	Merge	Upstream	D	33.9	В	19.2
16	16.3 NB I-95 On Ramp from Taylorsville Road WB	Merge	Upstream	E	40.0	с	21.3
10	16.4 SB I-95 Off Ramp to Taylorsville Road WB	Diverge	Downstream	В	19.3	E	42.9
	16 5 SR L-95 Off Pamp to Taylorsville Road ER	Diverge	Downstream	В	15.4	D	33.8
		Diverge	Upstream	В	15.4	D	33.8
	16.6 SB I-95 On Ramp from Taylorsville Road Both Directions	Merge	Upstream	В	11.4	с	25.2
	17.2 SB NJ 29 Off Ramp to I-95 SB	Diverge	Downstream	В	14.1	В	10.9
	17.3 I-95 SB Off Ramp	Diverge	Downstream	С	20.3	E	43.4
	17.4 SB I-95 On Ramp	Merge	Upstream	В	19.8	F	40.4
17	17.5 SB NJ 29 On Ramp from I-95 SB	Merge	Downstream	А	9.1	А	5.0
	17.7 NB I-95 Off Ramp	Diverge	Downstream	С	25.5	А	4.3
	17.8 SB NJ 29 On Ramp from NB I-95	Merge	Upstream	В	10.0	А	3.5
	19.1 NB I-95 Off Ramp to Bear Tavern Road Both Directions	Diverge	Downstream	С	21.9	А	7.9
	19.2 NB I-95 On Ramp from Bear Tavern Road Both Directions	Merge	Upstream	С	24.9	В	13.6
19	19.3 SB I-95 Off Ramp to Bear Tavern Road	Diverge	Downstream	В	18.4	D	28.4
	Both Directions	Diverge	Upstream	С	24.5	E	42.7
	19.4 SB I-95 On Ramp from Bear Tavern Road WB	Merge	Downstream	С	23.9	E	37.1
	19.5 SB I-95 On Ramp from Bear Tavern Road EB	Merge	Upstream	В	12.2	с	24.3
	I-95 SB	Weave	NA	В	11.2	С	22.3



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		Margal	Linstroom /	4	M Peak	P	M Peak
Loc.	Ramp	Diverge	Downstream	LOS	Density (pc/mi/ln)	Peak $PM Peak Pensity LOS Der(pc/r 23.3 C 2 17.4 C 2 13.6 C 2 26.4 B 11 39.1 C 2 12.9 C 2 26.1 B 1 25.7 E 3 35.3 D 2 35.3 D 2 25.2 B 1 20.4 D 2 9.3 B 1 $	Density (pc/mi/ln)
	21.1 NB Scotch Road Off Ramp to I-95 NB	Merge	Upstream	С	23.3	С	27.7
	21.2 NB Scotch Boad Off Bamp to LOE SB	Merge	Downstream	В	17.4	С	21.6
	21.2 NB SCOLER ROAD OF RAMP to 1-95 SB	Merge	Upstream	В	13.6	С	21.6
	21.2 ND Sectob Decid On Down from LOE ND	Diverge	Downstream	С	26.4	В	19.0
21	21.3 NB SCOLCH ROAD ON RAINP FOID I-95 NB	Diverge	Upstream	E	39.1	С	27.2
	21.4 NB Scotch Road On Ramp from I-95 SB	Diverge	Downstream	В	18.4	С	22.6
	21.6 SB Scotch Road Off Ramp to I-95 SB	Merge	Upstream	В	12.9	С	24.1
59	21.7 SB Scotch Road On Ramp from I-95 NB	Diverge	Downstream	с	26.1	В	12.9
59	US Route 1 SB	Weave	NA	С	25.7	Е	38.3
	60.1 NB US 1 Off Ramp to Oxford Valley Road	Diverge	Downstream	E	35.3	D	29.8
	Both Directions	Diverge	Upstream	Е	35.3	D	29.8
60	60.2 NB US 1 On Ramp to Oxford Valley Road Both Directions	Merge	Upstream	С	25.2	В	17.5
	60.3 SB US 1 Off Ramp to Oxford Valley Road Both Directions	Diverge	Downstream	с	20.4	D	29.9
	60.4 SB US 1 On Ramp from Oxford Valley	Merge	Downstream	А	9.3	В	14.9
	Road Both Directions	Merge	Upstream	А	9.3	В	16.2

* Traffic volumes along mainline I-95 and US Route 1 obtained from NJDOT Roadway Information and Traffic Monitoring System Program for year 2011 and projected for the year 2015 based on the traffic volume obtained from the Commission for I-95 and US 1 bridges.

Urban Streets Capacity Analysis

Capacity analyses were performed using Highway Capacity Software (HCS) 2010 Version 6.7 to determine the levels of service (LOS) and through V/C ratio of the study Urban Street segments for the existing AM and PM peak hour traffic volumes. These results are summarized in **Table 6.** The segments with a V/C ratio of 0.75 and above are highlighted in **Table 6** and **Figure 1**.

				Existing	g 2015 Tr	raffic Conditions			
				AM Peak			PM Peak		
#	Intersections	Direction		Percent	Thru		Percent		
			LOS	of Base	V/C	LOS	of Base	V/C	
				FFS	Ratio		FFS	Ratio	
29 &	Vardley Morrisville Rd between Afton Ave & Edgewood Rd	NB	А	89.32	0.28	А	94.07	0.24	
39	Tardiey Morrisville Na between Alton Ave & Edgewood Na	SB	А	88.95	0.43	А	87.74	0.52	
31	Pine Grove Rd between Yardley-Morrisville Rd and Big		С	66.72	0.41	С	65.91	0.46	
51	Oak Road	SB	С	60.33	0.58	В	73.42	0.54	

Table 6: Level of Service Summary (Urban Streets)



				Existing 2015 TransmissionAM PeakPM PeakOSPercent of Base FFSThru V/C RatioPercent of Base FFSThru V/C RatioE35.350.73D48.880.65D42.060.37E34.270.6B81.970.46B77.660.69A93.630.17A92.30.3C52.540.91F42.761.07A94.820.22A94.670.23B78.750.61A86.150.13A86.030.40B83.060.61B78.520.29B82.130.10B77.910.04B77.420.04					
				AM Peak			PM Peak		
 # 33 41 42 45 47 49 50 51 53 65.1 65.2 68.1* 68.2* 68.3* 68.4* 68.5* 69 72 	Intersections	Direction	LOS	Percent of Base FFS	Thru V/C Ratio	LOS	Percent of Base FFS	Thru V/C Ratio	
		NB	E	35.35	0.73	D	48.88	0.65	
33	Pine Grove Rd between Big Oak Rd and Trenton Ave	SB	D	42.06	0.37	E	34.27	0.6	
41	Yardley Morrisville Rd between Edgewood Rd and Pine	NB	В	81.97	0.46	В	77.66	0.69	
	Grove Rd	SB	А	93.63	0.17	А	92.3	0.3	
42	Edgewood Rd between Yardley-Morrisville Rd and Oxford Valley Rd	EB	С	52.54	0.91	F	42.76	1.07	
		WB	A	94.82	0.22	A	94.67	0.23	
45	Yardley Morrisville Rd between Pine Grove Rd and	NB	B	78.75	0.61	A	86.15	0.13	
		SB	A	86.03	0.40	В	83.06	0.61	
47	Yardley Morrisville Rd between Trenton Ave and Lincoln	NB	В	80.87	0.22	В	82.13	0.10	
	11wy	SB	В	78.52	0.29	В	82.29	0.45	
49	#Intersections13Pine Grove Rd between Big Oak Rd and Trenton Ave14Yardley Morrisville Rd between Edgewood Rd and Pine Grove Rd12Edgewood Rd between Yardley-Morrisville Rd and Oxford Valley Rd13Yardley Morrisville Rd between Pine Grove Rd and Trenton Ave14Yardley Morrisville Rd between Pine Grove Rd and Trenton Ave15Yardley Morrisville Rd between Trenton Ave and Lincoln Hwy19Yardley Morrisville Rd between Lincoln Hwy and US Route 110Trenton Ave between Lincoln Hwy and SR 207331Trenton Ave between Pennsylvania Ave and Big Oak Road33Trenton Ave between Big Oak Road and Pine Grove Rd34Oxford Valley Rd between Rt 1 NB and Rt 1 SB5.2Oxford Valley Rd between Rt 1 SB Big Oak Rd3.1*Bristol Oxford Valley Rd between S Bucks Town Dr and N Bucks Town Dr3.2*Oxford Valley Rd between N Bucks Town Dr and Commerce Blvd3.3*Oxford Valley Rd between Cabot Blvd and Rt 1 NB3.9Bristol Oxford Valley Rd between Trenton Ave & Lincoln Highway34Oxford Valley Rd between Cabot Blvd and Rt 1 NB35Oxford Valley Rd between Cabot Blvd and Rt 1 NB36Bristol Oxford Valley Rd between Trenton Ave & Lincoln Highway	NB	В	77.91	0.04	В	77.42	0.04	
		SB	В	76.92	0.46	С	59.65	0.59	
50	Trenton Ave between Lincoln Hwy and SR 2073	EB	С	52.87	0.90	В	71.7	0.48	
	· · · · · · · · · · · · · · · · · · ·	WB	C	65.82	0.25	С	55.61	0.75	
51	Trenton Ave between Pennsylvania Ave and Big Oak Road	EB	F	32.19	1.26	F	26.76	1.36	
		WB	Α	91.45	0.26	Α	85.4	0.75	
53	Trenton Ave between Big Oak Road and Pine Grove Rd	EB	В	69.28	0.57	В	69.88	0.61	
		WB	С	54.37	0.23	D	42.06	0.74	
6E 1	Ovford Valloy Pd botwoon Pt 1 NP and Pt 1 SP	NB	D	42.61	0.45	Е	33.03	0.72	
05.1		SB	E	39.21	0.20	F	25.09	0.88	
65.2	Ovford Valloy Pd botwoon Pt 1 SP Pig Oak Pd	NB	D	44.38	0.53	D	46.75	0.65	
05.2	Oxford valley ku between kt 1 36 big Oak ku	SB	С	55.80	0.32	E	39.14	0.81	
C0 1*	Bristol Oxford Valley Rd between Lincoln Highway and S	NB	С	50.09	0.41	E	32.9	0.50	
00.1	Bucks Town Dr	SB	D	43.20	0.20	F	19.74	1.01	
<u></u>	Oxford Valley Rd between S Bucks Town Dr and N Bucks	NB	E	39.94	0.49	E	35.88	0.62	
0 8. 2 '	Town Dr	SB	С	57.05	0.15	F	27.75	0.98	
68.3*	Oxford Valley Rd between N Bucks Town Dr and	NB	В	74.64	0.23	D	47.19	0.80	
	Commerce Blvd	SB	D	49.27	0.37	F	20.99	0.92	
68.4*	Oxford Valley Rd between Commerce Blvd and Cabot Blvd	NB	E	38.16	0.40	D	48.21	0.76	
		SB	B	78.27	0.28	В	75.13	0.39	
 68.2* Oxford Valley Rd between S Bucks Town Dr and N Bucks Town Dr 68.3* Oxford Valley Rd between N Bucks Town Dr and Commerce Blvd 68.4* Oxford Valley Rd between Commerce Blvd and Cabot Blvd 68.5* Oxford Valley Rd between Cabot Blvd and Rt 1 NB 	NB	E	31.27	0.63	F	6.55	1.29		
		SB	E	36.81	0.55	D	46.67	0.67	
 68.5* Oxford Valley Rd between Cabot Blvd and Rt 1 NB 69 Bristol Oxford Valley Rd between Trenton Ave & Lincoln Highway 	NB SP	C P	66.36	0.26	C P	64.79	0.19		
73	Linner Form Dd hetween Lewer Form Dd and Dt 24	3B	D C	/ 5.18	0.09	D	62.01	0.25	
12	opper Ferry ku between Lower Ferry Kd and Kt 31	EB	C	05.95	0.39	C	62.01	0.83	



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		I		Existing	g 2015 Tr	affic Co	onditions	
				Existing 20 AM Peak Percent T of Base N FFS R 75.69 0 67.84 0 62.43 0 33.55 0		PM Peak		
#	Intersections	Direction	LOS	Percent of Base FFS	Thru V/C Ratio	LOS	Percent of Base FFS	Thru V/C Ratio
		WB	В	75.69	0.39	С	66.35	0.81
74.1	W State St between Calberry St and Willow St	EB	EB B 67.84 0.66	0.66	С	63.73	0.42	
74.1	w state st between canoun st and whow st	WB	С	62.43	Thru Percent Thru V/C LOS Percent Thru 0.39 C 66.35 0.81 0.66 C 63.73 0.42 0.28 C 64.28 0.18 0.47 E 36.78 0.32 0.57 D 41.04 0.41			
74.2	W/ State St between Willow St and Warren St	EB	E	33.55	0.47	E	36.78	0.32
/4.2	w state st between winow st and warren st	WB	E	35.03	0.57	D	41.04	0.41

*Peak hour TMC at the intermediate signalized intersections obtained from DVRPC and adjusted for 2015.

Two-Lane Segments Capacity Analysis

Capacity analyses were performed using Highway Capacity Software (HCS) 2010 Version 6.7 to determine the levels of service (LOS) and V/C ratio of the study area two-lane segments for the existing AM and PM peak hour traffic volumes. These results are summarized in **Table 7.** All 2-lane segments operates at a V/C ratio below 0.75 for the existing 2015 pre-construction traffic volumes.

			AIV	l Peak	PM Peak	
#	Street Name	Direction	LOS	V/C RATIO	PM IOS 3 C 3 C 7 B 3 E 3 E 1 C 8 C 9 D 4 C 5 D 9 D 6 C 7 D 6 C 7 D 6 C 7 D 6 C 9 D 4 C 9 D 4 C 9 D 4 C 9 D 4 D 3 D 8 D 3 B 2 C	V/C RATIO
22	Washington Crossing Road (Route 532) From S.R. 2081 (Wrightstown Rd) to S.R.	NB	В	0.13	С	0.23
	2075 (Dolington Rd)	SB	В	0.17	В	0.16
22	Washington Crossing Road (Route 532) From S.R. 2075 (Dolington Rd) to S.R. 2069	NB	D	0.28	Е	0.46
25	(Lindenhurst Rd)	SB	Е	0.5	Е	0.32
24	Taylorsville Rd. (S.R. 2071) Between Route 532 (Washington Crossing Rd) and L95	EB	С	0.41	С	0.33
24		WB	С	0.38	С	0.39
25	Taylorsville Rd (S.R. 2071) Between Route I-95 and S.R. 2075 (Dolington Rd)	EB	С	0.19	D	0.45
25		WB	E	0.64	С	0.21
27	Main Street between Afton Ave and Dolington Rd	EB	D	0.25	D	0.41
27		WB	D	0.49	D	0.27
25	S. P. 2071 (Pine Grove Pd.) Retween S. P. 2026 (Trenton Ave) and U.S. Route 1	NB	С	0.37	D	0.51
35		SB	С	0.36	С	0.37
36	Taylorsville Rd. (S.R. 2071) Between Route 532 (Washington Crossing Rd) and Route	EB	С	0.3	С	0.3
50	32 (River Rd)	WB	С	0.21	С	0.25
37	Lindenhurst Rd. (S.R. 2069) From Route 532 (Washington Crossing Rd) to Route 332	NB	D	0.34	С	0.32
57	(Yardley Newtown Rd)	SB	С	0.39	С	0.31
20	River Road (Route 32) From Route 532 (General Washington Memorial Blvd) to	NB	D	0.29	D	0.29
30	Route 179 (Bridge St)	SB	С	0.24	D	0.35
/12	Vardley Langhorne Dike (S. R. 2019) East of Lags and West of Edgewood Rd	EB	D	0.23	D	0.26
43	Tardiey Langhome Fike (3.N. 2049) Last of 1-95 and west of Edgewood Ru	WB	С	0.18	D	0.24
11	Vardley Langhorne Dike (S. P. 2049) East of Edgewood Rd. & West of Pt. 222	EB	В	0.13	В	0.14
44	Tarticy Languotte Fike (3.n. 2049) Last of Lugewood nu. & West of ht. 552	WB	В	0.12	С	0.15

Table 7: Level of Service Summary (2-Lane Segments)



			AM	l Peak	PN	/I Peak
#	Street Name	Direction	LOS	V/C RATIO	LOS	V/C RATIO
E/	Pig Oak Pd (S.P. 2024) From S.P. 2071 (Dino Grove Pd) to S.P. 2060 (Stopy Hill Pd)	EB	D	0.32	С	0.18
54	big Oak Ku. (3.K. 2024) FIGHT 3.K. 2071 (Fine Glove Ku) to 3.K. 2009 (Stony Hill Ku.)	WB	С	0.17	D	0.2
55	Stopy Hill Rd (S. R. 2069) From U.S.1 to Big Oak Rd. (S. R. 2024)	NB	С	0.21	С	0.29
55	Stony min Rd (S.N. 2003) from 0.5 1 to big Oak Rd. (S.N. 2024)	SB	D	0.63	D	0.6
61	Route 332 (Yardley Newtown Rd) From I-95 to Mirror Lake Rd. (S.R. 2087)	EB	С	0.36	С	0.52
		WB	С	0.35	С	0.27
62	Route 332 (Yardley Newtown Rd) From Mirror Lake Rd. (S.R. 2087) to S.R. 2049	EB	С	0.21	С	0.25
	(Langhorne Yardley Rd)	WB	D	0.38	С	0.19
63	Route 332 (Afton Ave) From S.R. 2049 (Yardley Langhorne Rd) to S.R. 2071 (Main St)	EB	С	0.3	С	0.24
		WB	С	0.25	С	0.26
67	Oxford Valley Rd. (S.R. 2029) From Big Oak Rd. (S.R. 2024) to S.R. 2069 (Stony Hill	NB	С	0.33	D	0.39
	Rd)	SB	D	0.3	D	0.38
70	Bristol Oxford Valley Rd. (S.R. 2029) South of Woodbourne Rd. (S.R. 2033)	NB	C	0.36	D	0.37
		SB	С	0.35	D	0.41
71.1	Lower Ferry Rd/Reed Rd (CR 643) from CR 546 (Washington Crossing Pennington	NB	В	0.1	C	0.15
	Rd) to Upper Ferry Rd (CR 636)	SB	C	0.16	C	0.11
71.2	Ingleside Avenue from NJ Route 546 to NJ Route 31	NB	A	0.04	A	0.07
		SB	A	0.1	A	0.05
75	CR 546 (Washington Crossing Pennington Rd) From Route 29 (River Rd) to Bear	EB	С	0.18	C	0.44
	lavern Road (CR 579)	WB	С	0.38	C	0.18
77	CR 546 (Washington Crossing Pennington Rd) From Bear Tavern Road (CR 579) to	EB	D	0.54	С	0.24
	Jacobs Creek Road (CR 637)	WB	С	0.22	D	0.52
79	CR 546 (Washington Crossing Pennington Rd) From Jacobs Creek (CR 637) Road to	EB	D	0.55	C	0.25
	Scotch Road (CR 611)	WB	В	0.19	D	0.64
88	NJ Route 29 (River Rd) From I-95 to Jacobs Creek Road (CR 637)	NB	C	0.44	D	0.7
		SB	D	0.66	C	0.45
89	NJ Route 29 (River Rd) From Jacobs Creek Road (CR 637) to CR 546 (Washington Crossing Pennington Rd)	NB		0.43		0.6
		SR		0.63		0.43
90	Bear Tavern Road (CR 579) From CR 546 (Washington Crossing Pennington Rd) to	NB	В	0.19	C	0.35
		SR		0.42		0.24
91	Bear Tavern Road (CR 579) From Jacobs Creek Road (CR 637) to I-95	NB	D	0.39	C	0.35
		SB	D	0.4	C	0.49

5.6 Multi-Lane Lane Segments

Capacity analyses were performed using Highway Capacity Software (HCS) 2010 Version 6.7 to determine the Levels Of Service (LOS) and V/C ratio of the study area multi-lane segments for the existing AM and PM peak hour traffic volumes. These results are summarized in **Table 8**. The freeway segment operating above 0.75 V/C ratio is highlighted in **Table 8** and **Figure 1**.

			Existing 2015 Traffic Conditions												
	Segment	Dir.	AM Peak						PM Peak						
#			Demand Flow (pc/ln/hr)	Free Flow Speed (mph)	Capacity (pc/hr/ln)	v/c	LOS	Density (pc/mi/ln)	Demand Flow (pc/ln/hr)	Free Flow Speed (mph)	Capacity (pc/hr/ln)	v/c	LOS	Density (pc/mi/ln)	
	NJ 29 from	NB	1131	49	2000	0.57	С	22.6	545	49	2000	0.27	Α	10.9	
81	Warren St to Calhoun St	SB	832	49	2000	0.42	В	16.6	886	49	2000	0.44	В	17.7	
	NJ 29 from	NB	1615	49	2000	0.81	D	32.9	1179	49	2000	0.59	С	23.6	
82	Calhoun St to Parkside Ave	SB	1365	49	2000	0.68	D	27.3	1297	49	2000	0.65	С	25.9	
	NJ 29 from	NB	1068	53	2100	0.51	С	19.4	799	53	2100	0.38	В	14.5	
83	Parkside Ave to Sullivan Way	SB	993	53	2100	0.47	С	18.1	896	53	2100	0.43	В	16.3	
	NJ 29 from	NB	514	57	2100	0.24	А	9.3	608	57	2100	0.29	В	11.1	
84	Sullivan Way to Lower Ferry Rd	SB	850	57	2100	0.40	В	15.5	689	57	2100	0.33	В	12.5	
	NJ 29 from	NB	471	61	2200	0.21	А	7.8	635	61	2200	0.29	А	10.6	
85	Lower Ferry Rd to Wilburtha Rd	SB	771	61	2200	0.35	В	12.9	446	61	2200	0.20	А	7.4	
	NJ 29 from	NB	531	60	2200	0.24	А	8.9	663	60	2200	0.30	В	11.1	
86	Wilburtha Rd to Upper Ferry Rd	SB	784	60	2200	0.36	В	13.1	400	60	2200	0.18	А	6.7	
	NJ 29 from	NB	457	54	2100	0.22	А	8.3	640	54	2100	0.30	В	11.6	
87	Upper Ferry Rd to I-95	SB	804	54	2100	0.38	В	14.6	447	54	2100	0.21	А	8.1	
02	Scotch Rd from	NB	208	48	2000	0.10	А	4.2	362	48	2000	0.18	А	7.2	
92	CR 546 to I-95	SB	403	48	2000	0.20	А	8.1	228	48	2000	0.11	А	4.6	

Table 8: Level of Service Summary (Multi-Lane Segments)



6. AADT Calculations

The Annual Average Daily Traffic (AADT) volume estimates for the study roadway segments were determined using seasonal adjustment factors to modify the Average Daily Traffic (ADT) volumes obtained from the ATR counts conducted for this project. Two separate seasonal adjustment factors were used in calculating AADT volumes, these defined by the Pennsylvania Department of Transportation (PennDOT) and New Jersey Department of Transportation (NJDOT). Additionally, AADT volume for the study area bridges were obtained from the Commission for the bridges under their jurisdiction. AADT estimates are shown in **Table 9**.

C ¹	C 1.1.1			Direction ADT	T I	Adjustmer	nt Factor	Commission																		
Site	State	Classification	wonth		ADI	Iotai	PennDOT	NJDOT	Data	AADT																
1		Pridao	Oct	EB	2845	EOEE			7262	7262																
T	-	ыпиде	UCI	WB	3010	5655			7202	7202																
л		Pridao	Oct	NB	23675	E 2027			E0164	E0164																
4	-	ыпиде	ULI	SB	29162	52657			59104	59104																
E		Pridao	Dec	EB	11973	20160			17640	17640																
5	-	Bridge	Oct	WB	8187	20100			17040	17040																
Q		Bridge	Oct	EB	3714	15826			16008	16008																
0	_	bridge	Ott	WB	12122	13830			10008	10008																
10		Bridge	Oct	NB	35035	60260			70258	70258																
10	_	bridge	Ott	SB	25334	00509			70338	70558																
12	DA	TDC 1			Oct	NB	30401	6/163	0 022			50800														
13	FA	1101	Ott	SB	33762	04103	0.932			39800																
15	PΔ	TPG 1	Oct	NB	24660	53096			1 1 2	59/68																
13		1101	000	SB	28436				1.12	55408																
18	NI	12	Oct	NB	26671	56419			1 1 2	63189																
10	145			SB	29748				1.12	05105																
20	20 NI	12	12	Oct	NB	27098	56846		0 998		56732															
20	145	12	000	SB	29748	50040		0.550		50752																
22	PΔ	TPG 5	TPG 5	TPG 5	TPG 5	TPG 5	TPG 5	Oct	EB	2287	4493	1.025			4738											
~~~			Nov	WB	2206	1155	1.085																			
23	PΔ	TPG 5	TPG 5	TPG 5	TPG 5	TPG 5	TPG 5	TPG 5	TDG 5		TDG 5	TDG 5	TDG 5	TPG 5	TDC 5				Dec	EB	5414	10864	1.155			11839
23		103	Oct	WB	5450	10004	1.025			11055																
24	PΔ	TPG 5	Oct	EB	5546	11329	1 025			11612																
27	17	160.5	000	WB	5783	11525	1.025			11012																
25	ΡΔ	TPG 5	Oct	NB	4812	9260	1 025			9492																
23	ГA	163	000	SB	4448	5200	1.025			5452																
27	PΔ	TPG 5	Oct	NB	4837	9559	1 025			9798																
			000	SB	4722	5555	1.025			5750																
29	PΔ	TPG 5	Oct	NB	4729	8684	1 025			8901																
25				SB	3955	0004	1.025			0.01																
31	PΔ	TPG 5	Oct	NB	3464	7068	1 025			7245																
	IA	IFGJ	000	SB	3604	,000	1.025			1245																

#### Table 9: AADT Calculation



Sito	State	Classifiesties	Month	Direction ADT	ADT	Tatal	Adjustmer	nt Factor	Commission										
SITE		Classification			ADI	IOTAI	PennDOT	NJDOT	Data	AADI									
22	D٨	TPG 5	Oct	NB	3452	7545	1 025			773/									
55	FA	IFUS		SB	4093	7545	1.025			7754									
35	35 PA	TPG 5	Oct	NB	5877	11873	1 025			12119									
			000	SB	5946	11025	1.025			12115									
36	РА	TPG 5	Oct	NB	3544	6857	1 025			7028									
			000	SB	3313	0007	1.020			/ 020									
37	PA	TPG 5	Oct	NB	4083	8376	1.025			8585									
				SB	4293														
38	PA	TPG 5	Oct	NB	3894	7758	1.025			7952									
				SB	3864														
39	PA	TPG 5	Oct	NB	4639	9169	1.025			9398									
				SB	4530														
41	РА	TPG 5	Nov	NB	4313	8683	1.085			9421									
				SB	4370	0000				5.21									
12	PΔ	TPG 5	Oct	EB	2720	5599	1.025			5739									
42	FA		Ott	WB	2879	2222				5755									
12	D۸	TPG 5	Oct	NB	3030	6103	1 025			6256									
43	FA			SB	3073	0103	1.025			0250									
лл	DΛ	TPG 5	Oct	NB	1746	3501	1 025			3580									
	10	1103		SB	1755		1.025			3365									
15	/5 DA	TPG 5	TPG 5	TPG 5	TPG 5	TPG 5	TPG 5	TPG 5	TPG 5	TPG 5	TPG 5	Nov	EB	2044	2056	1.085			1179
43	FA				Oct	WB	1912	3930	1.025			4170							
17	DA		Oct	NB	4220	8863	1 025			0005									
47	FA	IFGS	ULI	SB	4643	8803	1.025			9063									
40	DA	TPG 3	Oct	NB	3417	11150	0.973			10940									
49	PA			SB	7733					10649									
50	D۸		Oct	EB	6489	1/1561	1 025			1/025									
50	FA	IFUS	Ott	WB	8072	14501	1.025			14925									
51	D۸	TPG 5	Oct	EB	9279	18165	1 025			18610									
51	FA	1965	1865	UCI	WB	8886	10105	1.025			10019								
E 2	DA		Oct	EB	8286	16047	1 025			17271									
22	PA	IPG 5	ULI	WB	8661	10947	1.025			1/5/1									
БЛ	DA		Oct	EB	2938	5747	1.025			E 901									
54	PA	IPG 5	UCI	WB	2809	5747	1.025			2691									
	DA		Oct	NB	3404	11650	1.025			11041									
22	PA	IPG 5	UCT	SB	8246		1.025			11941									
<b>F</b> C	•		0.+	NB	38095	FOCAC	0.072	0.070		F802C									
50	PA	IPG 3	UCL	SB	21551	59040	0.973			58036									
	DA		0-+	NB	28267	F2002	0.070												
5/	PA	IPG 3	Uct	SB	24615	52882	0.973			51454									



Sito	State	Classification	Month	Direction	ADT Total Adjustment Factor PennDOT NJDOT	Total	Adjustmer	nt Factor	Commission			
Site		Classification	wonth	Direction		NJDOT	Data	AADI				
58	D۸	TPG 3	Oct	NB	31941	63003	0 973			61302		
20	FA	160.5	000	SB	31062	03003	0.973			01302		
59	PΔ		Oct	NB	39148	76019	0 973			73966		
55	33 FA	1105	000	SB	36871	70015	0.575			/3500		
61	PΔ	TPG 5	Oct	EB	5542	10663	1 025			10930		
01		1105	000	WB	5121	10005	1.025			10550		
62	62 DA	TPG 5	Oct	EB	3473	7020	1 025			7196		
02	173	1103	000	WB	3547		1.025			/150		
63	ΡΑ	TPG 5	Oct	EB	3879	7723	1.025			7916		
05	173	1103	000	WB	3844	//25	1.025			/510		
65	PΔ	TPG 5	Oct	NB	15105	31539	1 025			32327		
05	173	1103	000	SB	16434	51555	1.025			52527		
67	PΔ	TPG 5	Oct	NB	5859	11404	1.025			11689		
07	173	1103	000	SB	5545					11005		
68	ΡΔ	TPG 5	TPG 5	TPG 5	Oct	NB	20306	39033	1 025			40009
00	173		000	SB	18727	35035	1.025			+0005		
69	69 PA	TPG 5	Oct	NB	4669	16990	1 025			11826		
05			000	SB	12321		1.025			11020		
70	PΔ	TPG 5	Oct	NB	6066	11046	1 025			11322		
			- ••	SB	4980					11522		
71.1	71 1 NI	17	Oct	NB	1430	2758		0.99		2730		
, 1.1		17		SB	1328	2750		0.55		2750		
71 2	NI	17	Oct	NB	516	1287		0 99		1274		
, 1.2		17	000	SB	771	1207		0.55		1271		
72	NU	16	Oct	EB	3994	7652		0 99		7575		
	145	10	000	WB	3658	7052		0.55		/3/3		
73	NI	19 BRIDGE	Oct	EB	6921	17590			0.875	15391		
/3		19, 511202	000	WB	10669	1/350			0.073	10001		
74	NI	19 BRIDGE	Oct	EB	3313	5892			0.875	5156		
<i>,</i> ,		19, DRIDGE	000	WB	2579	5652			0.073	5150		
75	NI	16 BRIDGE	Nov	NB	3366	7067		0.994		7010		
/3		10, 511502	Oct	SB	3701	/ 00/		0.99		,010		
77	NI	16	Oct	EB	3961	8005		0.99		7925		
	LAT	10		WB	4044			0.99		, 525		
79	NI	16	Oct	EB	4561	9207		0.99		9115		
				WB	4646	5207		0.00		5115		
81	NI	14	Oct	NB	21021	43638		0.98		42765		
	145	±7		SB	22617	13030		0.50		12,05		
82	NI	14	Oct	NB	22007	44025		0.98		43145		
02	145	74	Oll	SB	22018	4402J		0.50		43143		



Cito	Stata	Classification	Month	Direction	ADT	Total	Adjustmer	nt Factor	Commission								
Site	State	Classification		Direction	ADI IOtal	PennDOT	NJDOT	Data	AADT								
	1.4			1.4	Oct	NB	14614	20500		0.98		27010					
65	LNJ	14	Dec	SB	13894	28508		0.978		27910							
01	NU	14	Dec	NB	8688	17502		0.079		17205							
04	LNJ	14	Dec	SB	8904	17592		0.978		17205							
OF	NU	14	Oct	NB	8941	17565			0.98	17106							
65	LNJ	14	Dec	SB	8624	17505			0.978	1/190							
96	NU	14	Dec	NB	9360	10000		0.978		17702							
80	LNJ	14	Oct	SB	8722	18082		0.98		17702							
87 NJ	NU	14	14	11	11	Dec	NB	8870	17610		0.079		17220				
	INJ			SB 8748		0.978		17230									
00	NU	14	14	11	Oct	NB	6729	12002		0.08		12712					
00	INJ			Uli	SB	7264	12992		0.98		13/13						
00	NU	14	14	14	11	11	14	14	14	Oct	NB	6921	12052		0.00		12576
69	LNJ			ULI	SB	6932	12022		0.98		12210						
00	NU	J 16	Oct	NB	2706	E 9/1		0.99		5626							
90	INJ		TO	10	10	10	Nov	SB	3135	3641	0041	0.94		3020			
01	NU	16	Oct	NB	5077	10600		0.99		10226							
91	LNJ	10	Nov	SB	5532	10009		0.94		10220							
02	NU	16	Oct	NB	2289	6217		0.00		6455							
92 NJ	INJ		10	10	10	10	10	001	SB	3928	0217	0.9	0.99		0155		