

# ***Cabbage Street / Prestley Street Access Study***

**Borough of Carnegie & Collier Township  
Allegheny County, Pennsylvania**

***Prepared for***



**Southwestern Pennsylvania Commission**

**December 2004**

*Prepared by:*

**Baker**

***ChallengeUs.***

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## EXECUTIVE SUMMARY

This access study was conducted in order to develop and analyze options for improving safety and reducing congestion on Cubbage Street, a narrow residential street located in the Borough of Carnegie. Cubbage Street is the only access to Noblestown Road and Interstate 79 from the Lane Road business area of Collier Township. Traffic from Ewing Road/Collier Street, which serves Collier Township, also uses Cubbage Street. The analysis conducted as part of this study included a review of background information, traffic and truck data collection, capacity analysis, development and evaluation of conceptual alternatives, and coordination with the Pittsburgh and Ohio Central Railroad.

A total of nine (9) alternatives were developed for analysis. These alternatives varied from improvements to the existing Cubbage Street to roadways on new alignment. A comparison of the alternatives shows that Alternative 4 or 4A achieve the project goal of relieving truck traffic from Cubbage Street at the lowest cost. The main difference between these alternatives is that Alternative 4 avoids a commercial property while Alternative 4a results in the property take, which increases the cost, and potential environmental issues. Either of these alternatives should be considered as the project moves forward.

It is also recommended that Alternative 5B be considered as a future long-term improvement. While Alternative 4 or 4A would divert truck traffic from Cubbage Street, Alternative 5B would help to improve general access throughout the area by providing a direct connection between Ewing Road/Collier Street and Noblestown Road. It should be noted that this connector roadway has a 15% grade, making it undesirable for truck traffic, but could serve automobile traffic through the area.

## INTRODUCTION

Cabbage Street, in the Borough of Carnegie, is a narrow residential street and is the only access to Noblestown Road and Interstate 79 for trucks from the Lane Road area of Collier Township. The Lane Road area has several heavy commercial industries that generate truck traffic. Traffic from Ewing Road/Collier Street, which serves Collier Township, also uses Cabbage Street. In order to relieve safety concerns and reduce congestion on Cabbage Street, Michael Baker Jr., Inc. (Baker) performed a needs and feasibility study for an improved connection from Lane Road and Ewing Road/Collier Street to Noblestown Road. Baker's evaluation included a review of background information, traffic and truck data collection, capacity analysis, development and evaluation of conceptual alternatives, and coordination with the Pittsburgh and Ohio Central Railroad. This report documents the evaluation effort and provides recommendations for alternatives to be carried forward.



## EXISTING GEOMETRY

A field view of the study area was conducted to determine existing deficiencies. Deficiencies identified include substandard roadway widths, grades, and turning radii. The locations of missing connections were also identified. Figure 1 included in Appendix A shows the results of the field view.

## PHONE SURVEY

A telephone survey was conducted with a number of businesses in the Lane Road area to better understand the needs of those businesses. The following table summarizes the information collected during each of the surveys.



**Table 1 – Phone Survey Summary**

<b>Business Name:</b>	<b>Scalise Bros. Inc. Garage</b>	<b>Diversified Commodities</b>	<b>McDonald Equipment</b>	<b>Kusler Masonry Inc. (KMI)</b>	<b>Angelo Lane Inc</b>
<b>Address:</b>	Willow Street	1 Lane Road	6 W. Noblestown Road	23 Noblestown Road	12 Noblestown Road
<b>Phone #:</b>	412-276-2522	412-429-8564	412-278-1757	412-279-6507	412-279-1234
<b>Contact Date:</b>	5/20/2004	5/24/2004	5/20/2004	5/20/2004	5/20/2004
<b>1. On average, how many trucks are generated from your business?</b>	50 back and forth	2 outgoing and 3 incoming per week	2 per year (semi) and 3 per week (UPS, Fed, etc)	1 dump truck	60
<b>2. Do they make one daily trip or various trips throughout the day?</b>	Various trips throughout the day; six a day	Times vary throughout the day	--	Up to six times	Various trips throughout the day
<b>3. What type of trucks are in operation?</b>	Dump truck, tow truck, other companies bring trucks to be fixed	Tractor trailer and 18 ft box trucks	Semi	Dump trucks	Dump trucks, mixer trucks, block trucks
<b>4. What are the purposes of the truck trips?</b>	Concrete, delivery, etc; delivery to Angelo	Delivery	Deliver equipment	Deliver or pick up material at jobsite	Deliver materials to jobsites and receive material deliveries for their business
<b>5. What are the destinations of the trucks? Do they take a particular route?</b>	90% use I-79	I-79	--	70% of the time going to I-79	Varies
<b>6. Other Comments</b>	Have heard about this issue before and are interested in what will be done.	Cubbage Street is not wide enough for truck traffic.	Their operations have slowed in recent years due to the economy.	Access became more of a problem after I-79 was built.	--

**TRAFFIC DATA COLLECTION**

Baker conducted 24-hour automatic traffic recorder counts on Noblestown Road, Prestley Street, Collier Street, Lane Road, and Boyd Street. The following table is a summary of the average daily traffic volumes and truck traffic.

**Table 2 – Traffic Data Summary**

<b>Intersection</b>	<b>Year 2004 Average Daily Traffic Volume</b>	<b>Year 2004 Average Daily Truck &amp; Bus Volumes</b>
Noblestown Road	13,200	1,580
Prestley Street	1,900	55
Collier Street	3,000	155
Lane Road	420	140
Boyd Street	3,200	175

Turning movement counts were also conducted at the following intersections:

- Noblestown Road & Cubbage Street (signalized)
- Noblestown Road & Prestley Street (stop-controlled)
- Collier Street & Lane Road (stop-controlled)
- Collier Street & Prestley Street (stop-controlled)
- Collier Street & Boyd Street (stop-controlled)

The counts were conducted during typical weekdays from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. AM and PM peak hour volumes were determined for each intersection and are summarized in Figure 2 in Appendix A.

**EXISTING AND FUTURE NO-BUILD TRAFFIC ANALYSES**

Baker conducted a traffic analysis of the area intersections using Highway Capacity Software (HCS) in order to determine levels of service (LOS). The 2004 Existing condition was based on the Existing traffic volumes, lane configurations and traffic signal timings. The 2004 Existing Condition levels of service are shown in Table 3. Figure 3 in Appendix A shows the levels of service and lane configurations for the 2004 Existing Condition. All locations currently operate at LOS D or better with



the exception of the Southbound left turn in the PM peak hour at the intersection of Noblestown Road and Prestley Street. All HCS worksheets are included in Appendix D, which is a separate document.

The 2030 No-Build traffic volumes shown in Figure 4 were calculated by applying a 1% growth rate per year. The results of the 2030 No-Build analysis (shown in Figure 5 and Table 3) show the Southbound left turn in the PM peak hour at the intersection of Noblestown Road and Prestley Street is projected to continue to operate at LOS F. In addition to this location, the signalized intersection of Noblestown Road and Cubbage Street is projected to experience poor levels of service in the AM peak hour.

**Table 3 – Existing and No-Build Levels of Service**

Intersection	Approach / Movement		2004 Existing Condition		2030 No-Build Condition	
			AM	PM	AM	PM
Signalized Intersections						
Noblestown Road & Cubbage Street	EB	LT	C	B	F	B/C*
	WB	TR	C	C	C	D
	SB	LR	C	C	C	C
	Overall		C	C	E	D
Stop-Controlled Intersections						
Collier Street & Land Road	WB	LT	A	A	A	A
	NB	LR	B	B	B	B
Collier Street & Prestley Street	EB	LTR	A	A	A	A
	WB	LTR	A	A	A	A
	NB	LTR	B	B	B	B
	SB	LTR	B	B	B	B
Collier Street & Boyd Street **	EB	LTR	A	A	A	B
	WB	LTR	B	B	B	B
	NB	LTR	A	A	A	A
	SB	LTR	A	A	A	A
Noblestown Road & Prestley Street	EB	L	A	B	A	B
	SB	LR	B	F	C	F

\* De-facto left turn lane assumed by Highway Capacity Software based upon intersection volumes.

\*\* This location was analyzed as a two-way stop-controlled intersection since HCS cannot analyze a three-way stop-controlled intersection.

**CONCEPTUAL ALTERNATIVES**

Nine (9) potential alternatives were developed and evaluated based upon the existing deficiencies and missing connections in the study area. Plans and profiles are shown for the alternatives in Appendix B. The following is a description of each of the alternatives:

- Alternative 1** New roadway connects Old Noblestown Road west of Lane Road to Noblestown Road just east of Robinson Run.
- Alternative 1A** New roadway connects Old Noblestown Road west of Lane Road to Noblestown Road at the I-79 Northbound Ramp Intersection.
- Alternative 2** Extend Old Noblestown Road to the east, south of Margaret Avenue and connect to Noblestown Road west of Prestley Street.
- Alternative 3** Widen Cubbage Street to a 22-foot wide roadway.
- Alternative 4** Provide connector road between Lane Road and Prestley Street. This alternative would not take commercial property to the south.
- Alternative 4A** Provide connector road between Lane Road and Prestley Street. This alternative would take commercial property to the south.
- Alternative 5** Provide connector road between Lane Road and Collier Street. New intersection along Collier Street would be located approximately 320 feet from Lane Road. This alternative would be constructed along with either Alternative 4 or 4A.
- Alternative 5A** Provide connector road between Lane Road and Collier Street. New intersection along Collier Street would be located approximately 1,100 feet from Lane Road. This alternative would be constructed along with either Alternative 4 or 4A.
- Alternative 5B** Provide connector road between Lane Road and Collier Street and realign Collier Street such that the new roadway operates as the main movement. This alternative would be constructed along with either Alternative 4 or Alternative 4A.

Each of the alternatives improves access to the Lane Road area with the exception of Alternative 3, which improves the existing facility. A summary of the alternative evaluations is shown in Table 4. Table 5 shows a summary of the costs for each alternative. Detailed cost calculations are shown in Appendix C.



**Table 4 – Alternative Evaluation Summary**

Alternative	Alternative Evaluation	Cost
1	<ul style="list-style-type: none"> <li>- Creates new T-Intersection with Noblestown Road</li> <li>- 4-span structure over railroad</li> <li>- Reduces the Year 2030 daily number of trucks along Boyd/Cubbage Street from 220 to 45</li> <li>- 1 commercial property take - car/truck repair shop (active truck generator)</li> <li>- 6 residential property takes</li> <li>- \$1,600,000 in right-of-way costs</li> </ul>	\$6,322,600
1a	<ul style="list-style-type: none"> <li>- Creates new four-way intersection on Noblestown Road with I-79 NB Ramps</li> <li>- 5-span structure over railroad and Robinson Run</li> <li>- Reduces the Year 2030 daily number of trucks along Boyd/Cubbage Street from 220 to 45</li> <li>- 1 commercial property take - car/truck repair shop (active truck generator)</li> <li>- \$1,000,000 in right-of-way costs</li> </ul>	\$6,385,800
2	<ul style="list-style-type: none"> <li>- Creates new T-Intersection with Noblestown Road</li> <li>- Creates new at-grade railroad crossing at switch</li> <li>- Reduces the Year 2030 daily number of trucks along Boyd/Cubbage Street from 220 to 45</li> <li>- Retaining wall required along Margaret Avenue</li> </ul>	\$2,158,100
3	<ul style="list-style-type: none"> <li>- Utilizes existing Cubbage Street/ Noblestown Road intersection</li> <li>- Maintains existing location of at-grade railroad crossing with Cubbage Street</li> <li>- Improves width of Cubbage Street from 18' to 22'</li> <li>- Does not remove truck traffic from Cubbage Street</li> <li>- Potential detour may require local road improvements</li> <li>- 4 residential property takes</li> <li>- 3 garage impacts/demolitions</li> <li>- 5 front yard impacts</li> <li>- \$656,500 in right-of-way costs</li> </ul>	\$1,234,400
4	<ul style="list-style-type: none"> <li>- Utilizes existing Prestley Street/ Noblestown Road intersection</li> <li>- May require gates at railroad crossing</li> <li>- Maintains existing location of at-grade railroad crossing with Prestley Street</li> <li>- Reduces the Year 2030 daily number of trucks along Boyd/Cubbage Street from 220 to 45</li> <li>- Impacts stream flowing under Lane Road</li> <li>- \$80,000 in right-of-way costs</li> </ul>	\$1,309,900
4a	<ul style="list-style-type: none"> <li>- Utilizes existing Prestley Street/ Noblestown Road intersection</li> <li>- May require gates at railroad crossing</li> <li>- Maintains existing location of at-grade railroad crossing with Prestley Street</li> <li>- Impacts stream flowing under Lane Road</li> <li>- Reduces the Year 2030 daily number of trucks along Boyd/Cubbage Street from 220 to 45</li> <li>- 1 commercial property take - Petromax Ltd.</li> <li>- \$1,000,000 in right-of-way costs</li> </ul>	\$2,037,000
5	<ul style="list-style-type: none"> <li>- Constructed along with either Alternative 4 or 4a</li> <li>- Provides direct connection from Ewing Road/Collier Street to Alternative 4 and Alternative 4A</li> <li>- Requires two retaining walls</li> <li>- \$175,000 in right-of-way costs</li> </ul>	\$5,897,100
5a	<ul style="list-style-type: none"> <li>- Constructed along with either Alternative 4 or 4a</li> <li>- Provides direct connection from Ewing Road/Collier Street to Alternative 4 and Alternative 4A</li> <li>- Requires three retaining walls</li> <li>- \$175,000 in right-of-way costs</li> </ul>	\$2,949,000
5b	<ul style="list-style-type: none"> <li>- Constructed along with either Alternative 4 or 4a</li> <li>- Provides direct connection from Ewing Road/Collier Street to Alternative 4 and Alternative 4A</li> <li>- Realigns existing Ewing Road/Collier Street</li> <li>- Retaining wall required along Ewing Road/Collier Street</li> <li>- \$250,000 in right-of-way costs</li> </ul>	\$1,987,200

**Table 5 – Alternative Cost Summary**

Alternative	Environmental	Engineering	Utilities	Construction	Right-of-Way	Total (Includes 20% Contingency)
1	\$393,546	\$393,546	\$86,304	\$3,193,248	\$1,600,000	\$6,322,555
1A	\$448,813	\$448,813	\$98,424	\$3,641,688	\$1,000,000	\$6,385,761
2	\$179,842	\$179,842	\$38,102	\$1,460,581	\$0	\$2,158,103
3	\$48,154	\$48,154	\$8,538	\$392,748	\$656,500	\$1,234,352
4	\$189,216	\$94,608	\$19,710	\$768,690	\$80,000	\$1,309,904
4A	\$159,531	\$79,766	\$16,481	\$648,233	\$1,000,000	\$2,036,953
5	\$476,839	\$476,839	\$99,341	\$3,874,315	\$175,000	\$5,897,065
5A	\$224,914	\$224,914	\$46,857	\$1,827,423	\$250,000	\$2,948,963
5B	\$267,264	\$133,632	\$27,840	\$1,085,760	\$250,000	\$1,987,216

**FUTURE YEAR TRAFFIC ANALYSIS**

The 2030 Build volumes for each of the alternatives were calculated by determining the appropriate diversion of both cars and trucks. Alternatives 1, 1A & 2 are projected to have the same traffic volumes since each of these alternatives provide the same roadway connections. Alternative 4 is similar to Alternative 4A and Alternative 5 is similar to 5A. The Alternative 5B traffic volumes differ from Alternatives 5 & 5A due to the different configuration of the Collier Street / New Roadway Intersection. Figures 6 through 10 shows the projected traffic volumes for each of the alternatives.

Capacity analysis was conducted for each of the alternatives, the results of which are shown in Figures 11 through 15 and Table 6. Those alternatives that are projected to have the same traffic volumes and similar geometric characteristics were grouped together for the purposes of the capacity analysis.

In the case of Alternatives 1 through 5A, the levels of service at the existing intersections are projected to either stay the same or improve when compared to the No-Build Condition. LOS C or better are projected at locations where new intersections are created. For all of these alternatives, the southbound movement at the intersection of Noblestown Road and Prestley Street is projected to operate at LOS F. A peak hour signal warrant analysis showed that a signal is warranted in the PM peak hour at this location, however, a signal is not warranted in the AM peak hour.



For Alternative 5B, all locations are projected to operate at LOS D or better with the exception of the southbound movement at the intersection of Noblestown Road and Prestley Street which is projected to operate at LOS F during the AM and PM peak hours. The signal warrant analysis shows that a signal is warranted at this location during the PM peak hour, however, it is not warranted during the AM peak hour. Locations where new intersections are created are projected to operate at LOS A or B. All analysis worksheets are included in Appendix D, which is a separate document.

As mentioned above, the stop-controlled intersection of Noblestown Road and Prestley Street is projected to experience poor levels of service during at least one of the peak hours under each of the alternatives. Left turning traffic from Prestley Street (ranging from 15 to 90 vehicles per hour during the peak hours) do have the option of using the traffic signal on Cabbage Street in order to access Noblestown Road.

**Table 6 – Alternative Levels of Service**

Intersection	Approach / Movement		2030 Build Condition									
			Alternatives 1, 1A & 2		Alternative 3		Alternatives 4 & 4A		Alternatives 5 & 5A		Alternatives 5B	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Signalized Intersections												
Noblestown Road & Cabbage Street	EB	LT	F	B/C*	F	B/C*	F	B/C*	F	B/C*	D	C
	WB	TR	C	D	C	D	C	D	C	D	C	D
	SB	LR	C	C	C	C	C	C	C	C	B	C
	Overall		E	D	E	D	E	D	E	D	C	C
Stop-Controlled Intersections												
Collier Street & Land Road	WB	LT	A	A	A	A	A	A	A	A	A	A
	NB	LR	B	B	B	B	B	B	A	B	A	A
Collier Street & Prestley Street	EB	LTR	A	A	A	A	A	A	A	A	A	A
	WB	LTR	A	A	A	A	A	A	A	A	A	A
	NB	LTR	B	B	B	B	B	B	B	B	A	A
Collier Street & Boyd Street **	SB	LTR	B	B	B	B	B	B	B	B	B	B
	EB	LTR	A	B	A	B	A	B	A	B	A	A
	WB	LTR	B	B	B	B	B	B	B	B	A	B
Noblestown Road & Prestley Street	NB	LTR	A	A	A	A	A	A	A	A	A	A
	SB	LTR	A	A	A	A	A	A	A	A	A	A
	EB	L	A	B	A	B	A	B	A	B	B	B
Noblestown Road & New Roadway	SB	LR	C	F	C	F	C	F	C	F	F	F
	EB	L	B	B	--	--	--	--	--	--	--	--
Lane Road & New Roadway	SB	LR	C	C	--	--	--	--	--	--	--	--
	WB	LR	--	--	--	--	A	A	--	--	--	--
Lane Road & New Roadway	SB	LT	--	--	--	--	A	A	--	--	--	--
	EB	LTR	--	--	--	--	--	--	A	A	A	A
	WB	LTR	--	--	--	--	--	--	A	A	A	A
	NB	LTR	--	--	--	--	--	--	A	A	A	B
Collier Street & New Roadway	SB	LTR	--	--	--	--	--	--	A	A	B	B
	WB	LT	--	--	--	--	--	--	A	A	--	--
Collier Street & New Roadway	NB	LR	--	--	--	--	--	--	B	B	--	--
	EB	LT	--	--	--	--	--	--	--	--	A	A
Collier Street & New Roadway	SB	LR	--	--	--	--	--	--	--	--	A	A

**RAILROAD REVIEW**

A field view was conducted with the Ohio Central Railroad on June 14, 2004 to review the conceptual alternatives. The railroad stated the track running parallel to Noblestown Road typically carries a few trains two days per week during the daylight hours. The trains travel at approximately 10 miles per hour. Topics discussed are identified as follows:

- Alternatives 1 and 1A appear satisfactory.
- The new railroad crossing located on an existing switch proposed in Alternative 2 is not desirable due to safety concerns and maintenance issues.
- Alternatives 3, 4 and 4A would require gates and signals near Noblestown Road per PUC requirements.

**CONCLUSIONS**

Cabbage Street, in the Borough of Carnegie, is a narrow residential street and is the only access to Noblestown Road and Interstate 79 for trucks from the Lane Road area of Collier Township. The Lane Road area has several heavy commercial industries that generate truck traffic. Traffic from Ewing Road/Collier Street, which serves Collier Township, also uses Cabbage Street.

This report summarizes a needs and feasibility analysis for an improved connection from Lane Road and Ewing Road/Collier Street to Noblestown Road. The evaluation included a review of background information, traffic and truck data collection, capacity analysis, development and evaluation of conceptual alternatives, and coordination with the Pittsburgh and Ohio Central Railroad.

\* De-facto left turn lane assumed by Highway Capacity Software based upon intersection volumes.  
 \*\* This location was analyzed as a two-way stop-controlled intersection since HCS cannot analyze a three-way stop-controlled intersection.



Alternative 4 is projected to cost approximately \$1.3 million and Alternative 4A is estimated to cost approximately \$2.0 million. The Transportation Improvement Program (TIP) for the region is a fiscally constrained plan and identifying adequate funding is likely to be a challenge as planning for this project moves forward.

It is also recommended that Alternative 5B be considered as a future long-term improvement. While Alternative 4 or 4A would divert truck traffic from Cabbage Street, Alternative 5B would help to improve general access throughout the area by providing a direct connection between Ewing Road/Collier Street and Noblestown Road. It should be noted that this connector roadway has a 15% grade, making it undesirable for truck traffic, but could serve automobile traffic through the area.