OHIO DEPARTMENT OF TRANSPORTATION

Inter Office Communication

Date: April 17, 2006

To: Michelle May, Safety Program Manager

From: Richard Chaffin, District 9 Safety Review Team Chairperson

Subject: HSP Funding Request, Pik 32 & 220/Germany Road (No PID established)

The enclosed Safety Project Application along with the safety engineering study is being sent to you to request safety funds to disconnect State Route 220 from its existing intersection with State Route 32 and re-route State Route 220 across an existing county road that also crosses State Route 32. The county road will need to be upgraded and a traffic signal will be installed at the new intersection.

A copy of the safety application that was sent to Michelle May on 4-17-06.

This intersection is ranked 26th in the 2004 Highway Safety Program. It is a carry over project from the 2003 Highway Safety Program where it was ranked 18th. This intersection has continually been ranked in HSP since the intersection was constructed about 10 years ago. The intersection was constructed as part of the project that upgraded State Route 32 from two lanes to four lanes. We actually expected the intersection to rank higher in 2004 than in 2003 because there was a fatal accident in 2004 as well as several injury accidents.

Note: The construction cost estimate for this project has been inflated to the 2009 construction season which is the year funds have been requested for on the application.

Thank you in advance for your consideration in funding this project.

RDC

RDC

Enclosure

C: H. Fry, T. Long, Tom Barnitz, file

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This intersection is ranked 261 in the 2004 Highway Safety Program. It is a carry over project from the 2003 Highway Safety Program where it was ranked 183. This intersection has continually been ranked in HSP since the intersection was constructed about 10 years ago. The intersection was constructed as part of the project that upgraded State Route 32 from two lanes to four lanes. We actually expected the intersection to rank higher in 2004 than in 2003 because there was a fatal accident in 2004 as well as several injury accidents.

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RDC

Enclosure

C: H. Fry, T. Long, Tom Barnitz, file

Safety Project Application

Date: 4/11/2006

District: 09	Name of Contact Person: Richard Chaffin
Sponsoring Agency: ODOT	Phone/Fax: 740-773-2691 (Ext) 774-8973 740-775-4889
Estimated Project Cost: $2,939,038.26	Total Safety Funding Requested: $2,939,038.26
Brief Project Description:	

Project PID: (If assigned)	County: Pike	Route: S.R. 32 & 220/Germany Rd.	Section:

Project Description

Summary of Problem Statement:

This intersection is continually ranked in HSP. It is currently ranked 261 in the 2004 HSP listing. In the 2003 HSP listing it was ranked 183. We are experiencing a high rate of angle accidents within the intersection. The intersection sight distance is restricted some because of a railroad overpass which is approximately 800 feet east of the intersection. There is a vertical crest in the pavement caused by the overpass. The speeds of motorists on State Route 32 are high because State Route 32 is a four lane divided highway with a legal speed limit of 60 miles per hour.

Summary of Recommended Countermeasures:

The DSRT recommends re-routing State Route 220 across Schuster Road. Schuster Road is a local county road that intersects with State Route 32 a little more than one mile west of the existing S.R. 32 & 220 intersection. Schuster Road will be upgraded and a traffic signal will be installed at its intersection with S.R. 32. The existing S.R. 220 will become a county road and its access will be removed from S.R. 32. The Germany Road side of the intersection will remain but the through movement across S.R. 32 onto existing S.R. 220 will be removed. In addition, a left turn accleration lane will be constructed in the median for motorists turning left from Germany Road onto State Route 32.

Project Route Identification and Alignment. Please identify the limits of the project and approximate length.

Pike County, State Route 32, log points 18.57 to 20.00

Pike County, State Route 220, log points 13.67 to 15.23

Project Priority (HSP Ranking / LPA Prioritized List)

2004 HSP Ranking 261

2003 HSP Ranking 183

Project Development - Indicate which phases have been initiated, completed or an estimated completion date for each applicable phase.

Phase	*Conducted by*	*Completion Date*
☑ Safety Engineering Study	Richard Chaffin	3/2/2006
☐ Interchange Justification Study		
☐ Environmental		
☐ Right of Way		
☐ Design		

Crash Data		Points
Crash Frequency/Density:	27	2
Crash Rate:	2.91	4
Relative Severity Index:	$2,762	15
Equivalent Propery Damage Only Rate:	44.51	5
Percent Trucks:	13.56%	2
Rate of Return:	13.45%	2
	Total	**30**

The following information should be included in submission of the safety project application:

- ☑ Copy of the Safety Engineering Study (Include DSRT approval signatures)
- ☑ Traffic Volume Data
- ☑ Project Location Map
- ☑ Photographs of the Project Site
- ☑ Economic Analysis

Estimated Cost	Quarter / Fiscal Year	Local Contribution	Other Sources	Safety Request	Total
Environmental	1st / 2009				
Right of way	1st / 2009			1,000,000.00	1,000,000.00
Design	1st / 2008			250,000.00	250,000.00
Construction	3rd / 2009			1,689,038.26	1,689,038.26
Total				$2,939,038.26	$2,939,038.26

RESERVOIR PROJECT RESERVOIR YEAR

Applicant

Richard Chaffin / Traffic Management Analyst 740-774-8973

Printed Name/Title Phone #

Richard D. Chaffin 4-12-06

Signature/Date

EXECUTIVE SUMMARY

Intersection of State Route 32 & State Route 220 / Germany Road in Pike County

This intersection has been selected for analysis and study based upon a ranking of 183 in the 2003 Highway Safety Program. The ranking has currently dropped to 261 in the 2004 HSP listing. The intersection was ranked 105 in 2002 and it was ranked 219 in 2001. The purpose of the study is to determine safety issues at the intersection and to determine possible countermeasures to address the safety issues.

EXISTING CONDITIONS

State Route 32 is a four lane divided highway that travels from west to east across southern Ohio. State Route 220 is a local road that intersects State Route 32 from the north. Germany Road is also a local road that intersects from the south across from State Route 220. State Route 220 and Germany Road both stop for State Route 32. State Route 32 is the through roadway. It is a four divided highway with a speed limit of 60 miles per hour. This intersection was newly constructed in the mid 1990's with the project that upgraded State Route 32 from two lanes to four lanes. The intersection obviously meets ODOT design standards. However, there is some sight restriction east of the intersection because of a vertical curve in the pavement for a bridge structure over the CSX railroad. This structure is situated approximately 800 feet east of the intersection. The vertical curve causes some sight restriction for motorists approaching the intersection and for the motorists at the intersection observing the approaching vehicles. An overhead flasher was installed in October of 2002 to address these sight concerns. This flasher was recommended as the result of a safety study. The average daily traffic volume for State Route 32 is 8500 vehicles per day. The average daily traffic volume for State Route 220 is 3200 vehicles per day.

CRASH ANALYSIS

A three year period of crashes is required to be analyzed for the HSP study. The three years used for this study are 2002, 2003, and 2004. There were 27 accidents that occurred in the intersection during these three years. Most of the accidents were angle collisions. 89 percent or 24 of the 27 accidents were angle collisions. There were 2 right turn accidents, and 1 rear end accident. Of the 24 angle collisions, 13 of them involved vehicles approaching from the east which is the side where the sight is restricted by the vertical curve in the pavement. 59 percent or 16 of the accidents were injury accidents. There was 1 fatal accident. 81 percent or 22 of the accidents occurred on dry pavement. 89 percent or 24 of the accidents occurred during daylight hours. The main contributing factor of the accidents was failure to yield which usually is the contributing factor for angle collisions. Of the 24 angle collisions, all of the accident reports were coded as failure to yield. None of the accident reports were coded as running the stop sign.

POSSIBLE CAUSES OF THE ACCIDENTS

- The speeds are high on the through roadway. The speed limit on State Route 32 is 60 miles per hour. The actual observed 85 percentile speeds were 63 miles per hour for eastbound traffic and 65 miles per hour for westbound traffic.

- The sight distance is restricted on the east approach of the intersection due to the vertical curve in the pavement on the railroad overpass.

- There are additional conflict points when crossing a four lane highway versus crossing a two lane highway. Essentially, there are two intersections to cross.

POSSIBLE COUNTERMEASURES

- Install a stop and go traffic control signal. (The intersection does not meet a required warrant to install a stop and go traffic control signal. Furthermore, there would be a safety concern with a traffic control signal because of the sight issue on the east approach of the intersection. There would be potential for rear end collisions on this approach).

- Construct an interchange. (An interchange would be cost prohibitive at this intersection especially with the railroad being situated 800 feet from the intersection).

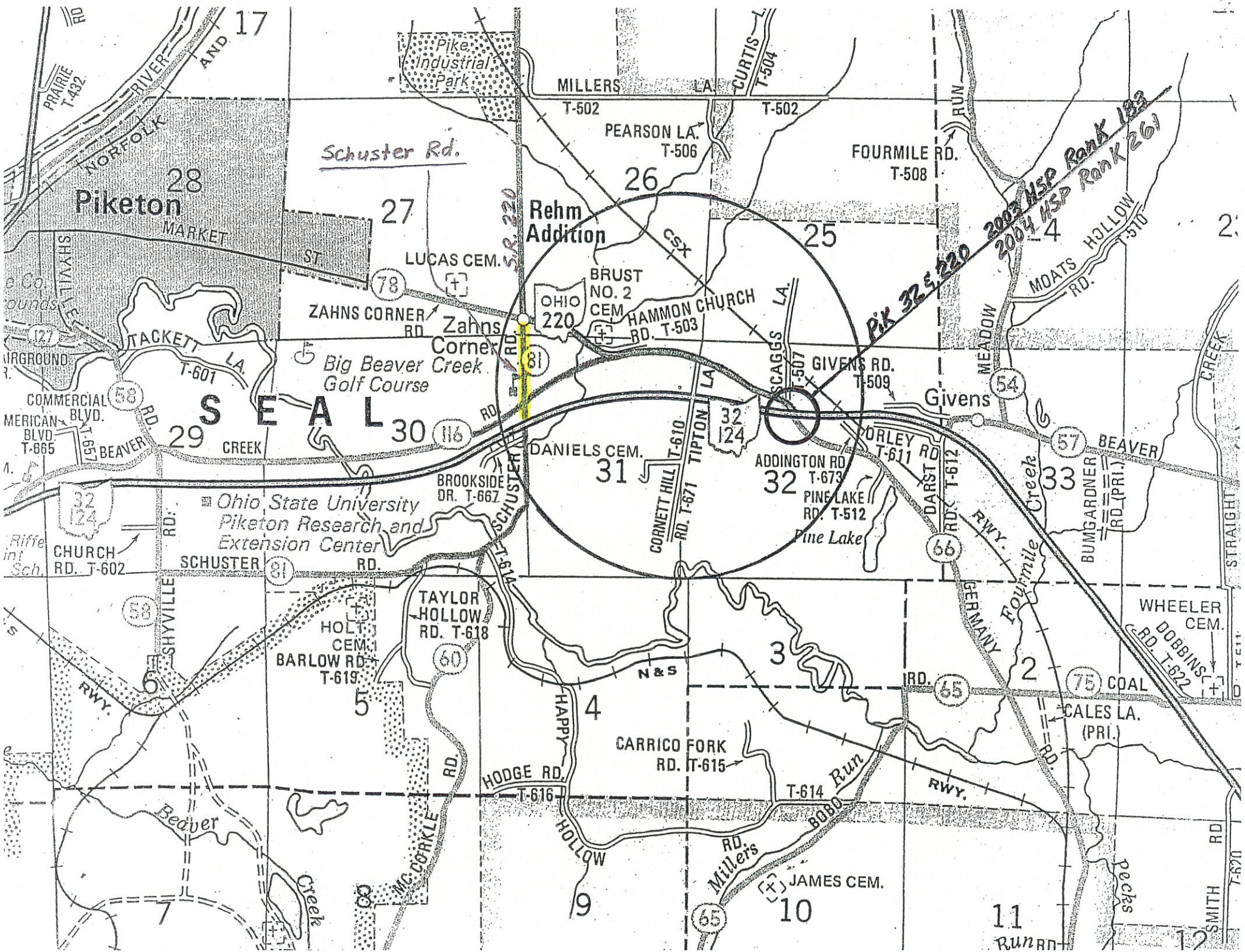
- Reroute State Route 220 across Shuster Road which already intersects with State Route 32. Currently State Route 220 intersects with Shuster Road approximately one half mile from State Route 32. From this intersection, State Route 220 turns 90 degrees and travels 1.56 miles before it intersects with State Route 32. If Shuster Road were utilized as State Route 220 it would be a straight alignment directly to State Route 32 that would be one mile shorter in length. The benefit would be that this intersection does not have any sight restrictions. However, this benefit would have limited effectiveness if the existing State Route 220 access to State Route 32 remains connected. The existing one half mile of Shuster Road would have to be upgraded to ODOT specifications before it can become a state route.

- Relocate the existing intersection. (This would be a very costly alternative with the right of way issues involved. The right of way costs to purchase new right of way for the relocation would be significant. Also, the right of way at the existing intersection was recently built up with a new convenient store / gas station. We may loose a considerable amount of money in a lawsuit with the property owner of the new store if their access to State route 32 is removed).

(See page 3 for recommendation)

RECOMMENDATION

The DSRT recommends re-routing State Route 220 across Schuster Road. This is an existing local county road that intersects State Route 32 a little more than one mile west of the existing intersection. Schuster Road will have to be upgraded and a traffic light will have to be installed where it intersects with State Route 32. The existing State Route 220 will become a county road and its access will be removed from State route 32. The south side of the existing intersection will remain connected to State Route 32. This leg of the intersection is Germany Road. This is the leg of the intersection that has the new store that was recently constructed. However, this traffic will not be able to cross the median and enter onto State Route 220 because it will be disconnected. A left turn acceleration lane will be constructed in the median for motorists turning left out of Germany Road onto State Route 32.


Pike Industrial Park
MILLERS LA. T-502
CURTIS T-504
PEARSON LA. T-506
FOURMILE RD. T-508
Schuster Rd.
Piketon
MARKET ST
SHYVILLE
NORFOLK AND PRAIRIE T-432 RIVER
Rehm Addition
CSX
S.R. 220
LUCAS CEM.
BRUST NO. 2 CEM
OHIO 220
HAMMON CHURCH RD. T-503
ZAHNS CORNER RD.
Zahns Corner
Big Beaver Creek Golf Course
SCAGGS LA. T-507
GIVENS RD. T-509
Givens
MEADOW
MOATS HOLLOW RD. T-510
2003 HSP Rank 183
2004 HSP Rank 261
PIK 32 & 220
TACKETT LA. T-601
COMMERCIAL BLVD.
AMERICAN BLVD. T-865
SEAL
BEAVER CREEK
DANIELS CEM.
TIPTON LA. T-610
CORNETT HILL RD. T-671
ADDINGTON RD. T-673
PINE LAKE RD. T-512
Pine Lake
DARST RD. T-612
ORLEY RD. T-611
BROOKSIDE DR. T-667
Ohio State University Piketon Research and Extension Center
CHURCH RD. T-602
SCHUSTER RD.
SCHUSTER T-614
TAYLOR HOLLOW RD. T-618
HOLT CEM.
BARLOW RD. T-619
SHYVILLE RD.
HAPPY HOLLOW RD.
CARRICO FORK RD. T-615
HODGE RD. T-616
T-614 Run
BOBO RD.
MC CORKLE RD.
Beaver Creek
Millers RD.
JAMES CEM.
Fourmile Creek
GERMANY RD.
BUMGARDNER RD. (PRI.)
WHEELER CEM.
DOBBINS RD. T-622
COAL CALES LA. (PRI.)
STRAIGHT CREEK
Pecks RUN RD.
SMITH RD. T-670
RWY.
N&S
Riffe Int. Sch.

HIGHWAY SAFETY PROGRAM
RECOMMENDATION SHEET

LOCATION:

COUNTY/ROUTE/SECTION Pike County, State Route 32 & 220 / Germany Road

JURISDICTION ODOT / County

HSP YEAR: 2004 **HSP PRIORITY RANKING:** 261

DISTRICT'S PROBLEM STATEMENT:

This intersection is continually ranked in HSP. It is currently ranked 261 in the 2004 HSP listing. In the previous HSP listing it was ranked 183. We are experiencing a high rate of angle accidents at the intersection. There is some restriction of the intersection sight distance due to a railroad overpass approximately 800 feet east of the intersection. The speeds of motorists are high on S.R. 32 because S.R. 32 is a four lane divided highway with a speed limit of 60 miles per hour.

DISTRICT'S RECOMMENDATION:

The DSRT recommends re-routing State Route 220 across Schuster Road. This is a local county road that intersects State Route 32 a little more than mile one west of the existing intersection. Schuster Road will be upgraded and a traffic signal will be installed at the new intersection of S.R. 32 & 220. The existing S.R. 220 will become a county road and its access will be removed from S.R. 32. The Germany Road side of the intersection will remain but the through movement across S.R. 32 onto existing S.R. 220 will be removed. In addition, an acceleration lane will be constructed in the median for motorists turning left from Germany Road onto State Route 32.

DISTRICT 9 SAFETY REVIEW TEAM:

DSRT MEMBER (TYPED)	SIGNATURE	DATE	COMMENTS (ATTACHED)
1ST Todd Long, Planning Adm.	Todd A. Long	11/1/05	
2ND Vaughn Wilson, Hwy. Mgmt. Adm.	V E Wilson	10-31-05	
3RD Tom Barnitz, Production Adm.	Tom Barnitz	11-1-05	
4TH Gregory Baird, Studies Engr.	Gregory A. Baird	11-1-05	
5TH Patricia Wetzel, Trans. Engr.	Patricia Wetzel	11-01-05	
6TH David Norris, Assit. DDD Engr.	David A. Norris	10-31-05	
7TH Richard Chaffin (Chair)	Richard D. Chaffin	10-31-05	
OPTIONAL MEMBERS:			
ADDITIONAL ODOT, FHWA, AND/OR OUTSIDE MEMBERS			

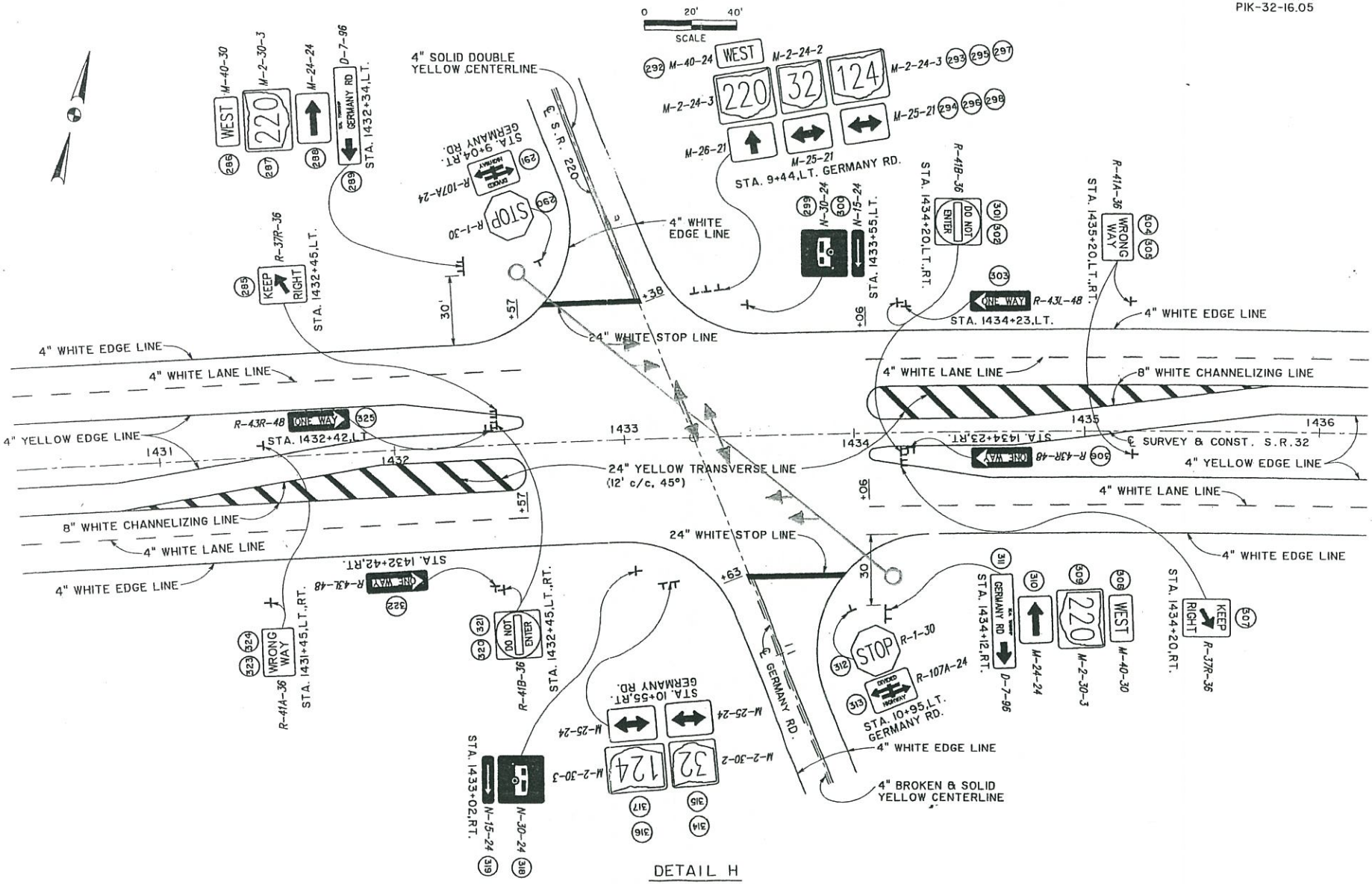
SIGNING AND PAVEMENT MARKING

FHWA REGION	STATE	PROJECT	CALC. EJT
5	OHIO		DATE: 6-93
			CHKD. CJH
			DATE: 2-94

414
517

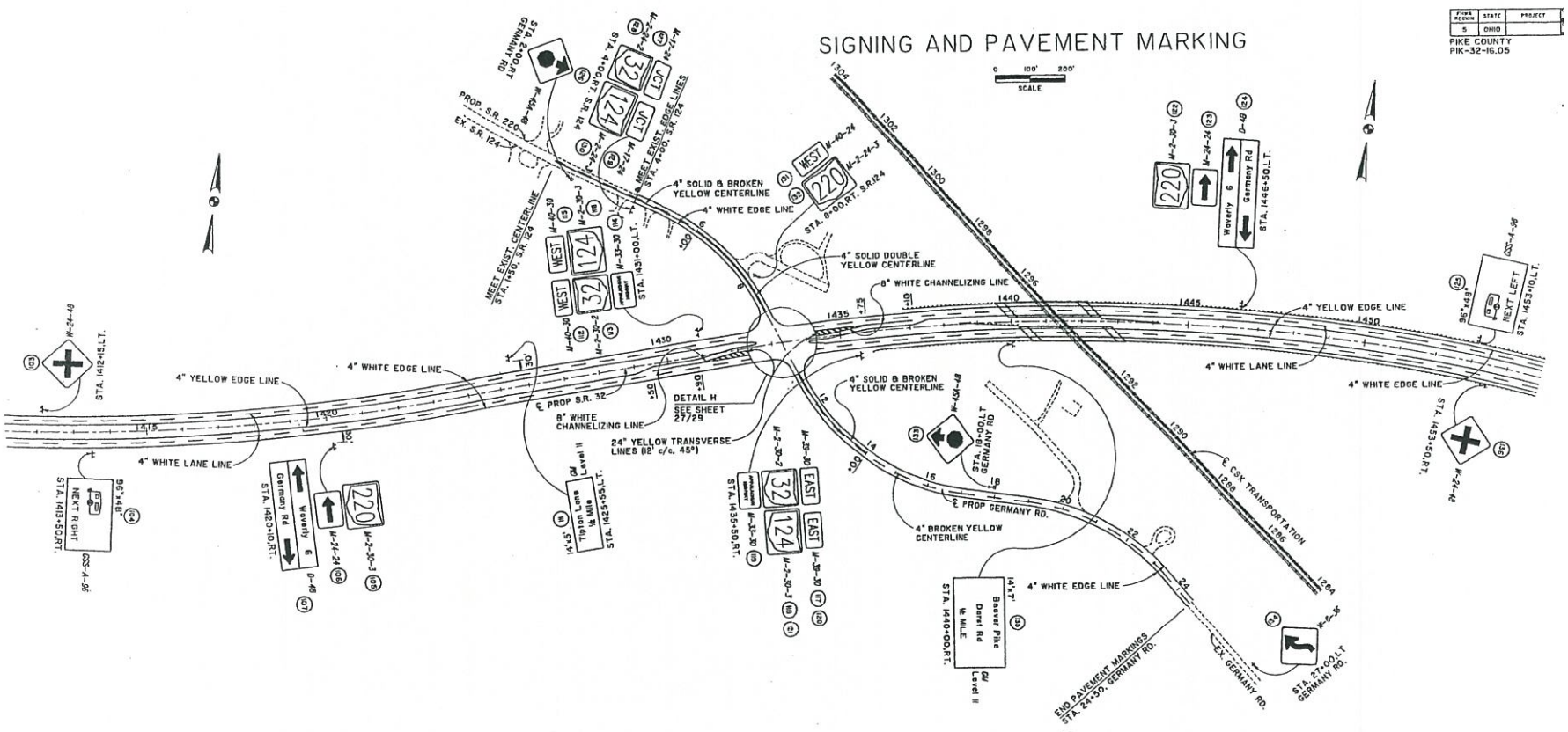
PIKE COUNTY
PIK-32-16.05

27
29



DETAIL H

S.R. 32-GERMANY RD. INTERSECTION


SIGNING AND PAVEMENT MARKING
SCALE
0 100' 200'
PIKE COUNTY
PIK-32-16.05
4" SOLID & BROKEN YELLOW CENTERLINE
4" WHITE EDGE LINE
4" SOLID DOUBLE YELLOW CENTERLINE
8" WHITE CHANNELIZING LINE
4" YELLOW EDGE LINE
4" WHITE LANE LINE
24" YELLOW TRANSVERSE LINES (12" c/c, 45°)
DETAIL H
SEE SHEET 27/29
℄ PROP S.R. 32
℄ PROP GERMANY RD.
℄ CSX TRANSPORTATION
4" BROKEN YELLOW CENTERLINE
PROP. S.R. 220
EX. S.R. 124
MEET EXIST. CENTERLINE STA. 1390+00 S.R. 124
MEET EXIST. EDGE LINES STA. 4+00 S.R. 124
STA. 1412+15 LT.
STA. 1413+50 RT.
STA. 1420+10 RT.
STA. 1431+00 LT.
STA. 1435+50 RT.
STA. 1440+00 RT.
STA. 1446+50 LT.
STA. 1453+10 LT.
STA. 1453+50 RT.
STA. 27+00 LT GERMANY RD.
END PAVEMENT MARKINGS STA. 24+50, GERMANY RD.
EX. GERMANY RD.
NEXT RIGHT
NEXT LEFT
Waverly 6
Germany Rd
Beaver Pike
Darst Rd
½ MILE
Level II
WEST
EAST
220
124
32

DISTRICT - 09
COUNTY - PIK

ROADWAY DESCRIPTION INVENTORY REPORT - DESTAPE

MUNI CODE	LOCATION ROUTE	LOGPT	DIR	PRIMARY LOCATION ROUTE	LOGPT	REFERENCE TYPE	CROSS ROUTE NUMBER	LOGPT	REFERENCE POINT DESCRI
	SR 0032R	0731	1 E			INTERSECTION -I	TR 0335		T0335 BURKITT
	SR 0032R	0785	1 E			BRIDGE -G			BRIDGE
	SR 0032R	0796	1 E			INTERSECTION -I	SR 0772R	0911	S0772R
	SR 0032R	0800	1 E			MILEPOST -M			MILE POST = 008
	SR 0032R	0831	1 E			INTERSECTION -I	CR 0023		C0023 CHENOWETH FORK
	SR 0032R	0876	1 E			BRIDGE -G			BRIDGE
	SR 0032R	0900	1 E			MILEPOST -M			MILE POST = 009
	SR 0032R	0935	1 E			INTERSECTION -I	TR 0338		T0338 GLEASON
	SR 0032R	1000	1 E			MILEPOST -M			MILE POST = 010
	SR 0032R	1002	1 E			INTERSECTION -I	SR 0124R	1712	S0124R
	SR 0032R	1002	2 E			INTERSECTION -I	SR 0772R	1117	S0772R
	SR 0032R	1002	3 E			INTERSECTION -I	CR 0085		C0085 TENNYSON
	SR 0032R	1100	1 E			MILEPOST -M			MILE POST = 011
	SR 0032R	1106	1 E			INTERSECTION -I	TR 0340		T0340 SMOKEY HOLLOW
	SR 0032R	1106	2 E			INTERSECTION -I	CR 0086		C0086 SMOKEY HOLLOW
	SR 0032R	1323	1 E			BRIDGE -G			BRIDGE
	SR 0032R	1372	1 E			INTERSECTION -I	SR 0104R	0657	S0104R
	SR 0032R	1374	1 E			BRIDGE -G			BRIDGE
	SR 0032R	1396	1 E			BRIDGE -G			BRIDGE
	SR 0032R	1433	1 E			BRIDGE -G			BRIDGE
	SR 0032R	1495	1 E			INTERSECTION -I	CR 0117		C0117 GROVE
	SR 0032R	*1521	1 E			OVERPASS -O	US 0023R	0640	U0023R
	SR 0032R	*1523	1 E			OVERPASS -O	US 0023R	0640	U0023R
	SR 0032R	1530	1 E			RAILRD OVER -V			NORFOLK SOUTHERN R R
	SR 0032R	1545	1 E			INTERSECTION -I	CR 0064	0577	C0064 WAKFIFELD MOUND
	SR 0032R	1560	1 E			INTERSECTION -I	CR 0115	0000	C0115 MOUND CEMETERY
	SR 0032R	1570	1 E			RAILRD OVER -V			NORFOLK SOUTHERN R R
	SR 0032R	1574	1 E			BRIDGE -G			BRIDGE
	SR 0032R	1608	1 E			INTERSECTION -I	CR 0116	0000	C0116 BEAVER CREEK
	SR 0032R	1679	1 E			INTERSECTION -I	CR 0058	0086	C0058 SHYVILLE
	SR 0032R	1765	1 E			BRIDGE -G			BRIDGE
	SR 0032R	1857	1 E			INTERSECTION -I	CR 0081	0225	C0081 SCHUSTER
	SR 0032R	1936	1 E			INTERSECTION -I	TR 0610	0031	T0610 TIPTON
	SR 0032R	2000	1 E			INTERSECTION -I	SR 0220R	1523	S0220R
	SR 0032R	2000	2 E			INTERSECTION -I	CR 0066	0796	C0066 GERMANY
	SR 0032R	2014	1 E			RAILRD UNDER -N			CSX R R
	SR 0032R	2061	1 E			INTERSECTION -I	TR 0612		T0612 DARST
	SR 0032R	2061	2 E			INTERSECTION -I	CR 0057		C0057 BEAVER
	SR 0032R	2128	1 E			BRIDGE -G			BRIDGE
	SR 0032R	2224	1 E			INTERSECTION -I	CR 0075		C0075 COAL DOCK
	SR 0032R	2261	1 E			BRIDGE -G			BRIDGE
	SR 0032R	2270	1 E			INTERSECTION -I	TR 0620		T0620 SMITH
	SR 0032R	2414	1 E			INTERSECTION -I	CR 0076		C0076 RED HOLLOW
	SR 0032R	2515	1 E			BRIDGE -G			BRIDGE
	SR 0032R	2587	1 E			INTERSECTION -I	SR 0335R	0525	S0335R

DISTRICT - 09
COUNTY - PIK

ROADWAY DESCRIPTION INVENTORY REPORT - DESTAPE

MUNI CODE	LOCATION ROUTE	LOGPT	DIR	PRIMARY LOCATION ROUTE	LOGPT	REFERENCE TYPE		CROSS ROUTE NUMBER	LOGPT	REFERENCE POINT DESCRI
	SR 0220R	1244	1 E			INTERSECTION	-I	TR 0533		T0533 PIKE
	SR 0220R	1246	1 E			INTERSECTION	-I	TR 0502		T0502 MILLERS
	SR 0220R	1258	1 E			RAILRD UNDER	-N			CSX R R
	SR 0220R	1283	1 E			INTERSECTION	-I	TR 0532	0000	T0532 INDUSTRIAL PARK
	SR 0220R	1295	1 E			MILEPOST	-M			MILE POST = 013
	SR 0220R	1347	1 E			INTERSECTION	-I	TR 0533	0000	T0533 PIKE
	SR 0220R	1355	1 E			INTERSECTION	-I	TR 0534		T0534 ZAHNS
	SR 0220R	1366	1 E			INTERSECTION	-I	CR 0078		C0078 ZAHNS CORNER
	SR 0220R	1367	1 E			INTERSECTION	-I	CR 0081		C0081 SCHUSTER
	SR 0220R	1374	1 E			INTERSECTION	-I	TR 0535		T0535 WADSWORTH
	SR 0220R	1397	1 E			MILEPOST	-M			MILE POST = 014
	SR 0220R	1403	1 E			BRIDGE	-G			BRIDGE
	SR 0220R	1417	1 E			INTERSECTION	-I	TR 0503		T0503 HAMMON CHURCH
	SR 0220R	1419	1 E			INTERSECTION	-I	CR 0116		C0116 BEAVER CREEK
	SR 0220R	1460	1 E			INTERSECTION	-I	TR 0610	0067	T0610 TIPTON
	SR 0220R	1506	1 E			INTERSECTION	-I	TR 0507	0000	T0507 SCAGGS
	SR 0220R	1518	1 E			INTERSECTION	-I			PARK AND RIDE
	SR 0220R	1523	2 E			INTERSECTION	-I	SR 0032R	2000	S0032R
	SR 0220R	1523	1 E			END ROUTE	-Z	SR 0032R	2000	END AT SR 0032R
	SR 0335R	0000	1 NW			BEGIN ROUTE	-A			LEAVE SCI CO AT 1600
	SR 0335R	0001	1 NW			INTERSECTION	-I	TR 0652		T0652 STAKER
	SR 0335R	0025	1 NW			INTERSECTION	-I	TR 0661		T0661 SUNSET
	SR 0335R	0040	1 NW			INTERSECTION	-I	CR 0076		C0076 RED HOLLOW
	SR 0335R	0052	1 NW			INTERSECTION	-I	TR 0660		T0660 CHURCH
	SR 0335R	0060	1 NW			INTERSECTION	-I	CR 0071		C0071 STOCKDALE
	SR 0335R	0065	1 NW			INTERSECTION	-I	TR 0659		T0659 BACK
	SR 0335R	0071	2 NW			INTERSECTION	-I	CR 0072		C0072 CALIFORNIA
	SR 0335R	0100	1 NW			MILEPOST	-M			MILE POST = 001
	SR 0335R	0185	1 NW			INTERSECTION	-I	TR 0647		T0647 POSEY RIDGE
	SR 0335R	0200	1 NW			MILEPOST	-M			MILE POST = 002
	SR 0335R	0240	1 NW			INTERSECTION	-I	TR 0645		T0645 VANFOSSON
	SR 0335R	0300	1 NW			MILEPOST	-M			MILE POST = 003
	SR 0335R	0345	1 NW			INTERSECTION	-I	TR 0644		T0644 WEBB
	SR 0335R	0367	1 NW			INTERSECTION	-I	TR 0640		T0640 SALEM CAVE
	SR 0335R	0400	1 NW			MILEPOST	-M			MILE POST = 004
	SR 0335R	0416	1 NW			INTERSECTION	-I	TR 0639		T0639 BAILEY
	SR 0335R	0446	1 NW			BRIDGE	-G			BRIDGE
	SR 0335R	0500	1 NW			MILEPOST	-M			MILE POST = 005
	SR 0335R	0522	2 NW			INTERSECTION	-I	TR 0636		T0636 WEST
	SR 0335R	0523	1 NW			INTERSECTION	-I	CR 0077		C0077 ADAMS
	SR 0335R	0525	1 NW			INTERSECTION	-I	SR 0032R	2587	S0032R
	SR 0335R	0528	1 NW			INTERSECTION	-I	CR 0083		C0083 TILE MILL
	SR 0335R	0581	1 NW			BRIDGE	-G			BRIDGE
	SR 0335R	0600	1 NW			MILEPOST	-M			MILE POST = 006

2004 PIKE CO 1
AVERAGE 24-HR TRAFFIC VOLUME

	SECT. BEGINS	TRAFFIC SECTION	SECT. LENGTH	PASS & A COM'L	B & C COM'L	TOTAL VEH.
		US-23				
	00.00	SCIOTO CO. LINE	3.95	11920	1920	13840
	03.95	ENT. TO U.S. DEPT. OF ENERGY PLANT	2.45	12760	2350	15110
	06.40	SR 32	.68	16300	2100	18400
U	07.08	S. CORP. PIKETON	1.23	16300	2100	18400
	08.31	N. CORP. PIKETON	3.31	16300	2100	18400
U	11.62	S.W. CORP. WAVERLY	.23	17930	1980	19910
U	11.85	SR 104 (LAKE WHITE RD.)	.64	19590	1790	21380
U	12.49	SR 220 (MARKET ST.)	.35	18170	1900	20070
U	12.84	SR 335 (CLOUGH ST.)	.42	14720	1610	16330
	13.26	N.E. CORP. WAVERLY	3.02	14720	1610	16330
	16.28	EQUALS STA. 0.00 IN ROSS CO.	.00			
		SR-32				
	00.00	ADAMS CO. LINE	7.96	3540	1280	4820
	07.96	SR 772	2.06	4900	1290	6190
	10.02	SR 124	3.70	7150	1550	8700
	13.72	SR 104	1.49	8530	1500	10030
	15.21	US 23	4.79	7200	1630	8830
	20.00	SR 220	.61	7330	1150	8480
	20.61	C-57 (BEAVER PIKE)	5.26	5110	1000	6110
	25.87	SR 335	2.55	4590	1040	5630
	28.42	EQUALS STA. 0.00 IN JACKSON CO.	.00			
		SR-41				
	00.00	HIGHLAND CO. LINE	5.20	1040	40	1080
	05.20	ENTER ROSS CO. STA. 0.00	.00			
	05.20	LEAVE ROSS CO. STA. 0.42	.19	1040	40	1080
	05.39	EQUALS STA. 0.42 IN ROSS CO.	.00			
		SR-104				
	00.00	SCIOTO CO. LINE	3.75	2140	460	2600
	03.75	C-28 (LOYS RUN RD.)	2.82	2880	480	3360
	06.57	SR 32	4.09	4010	330	4340
	10.71	SR 551	.78	5240	420	5660
	11.49	SR 552	.76	7370	500	7870
U	12.25	S. CORP. WAVERLY	.46	9940	760	10700
	12.71	US 23 (EMMITT AVE.)	4.43	SEE PREFERRED ROUTE		
	17.14	EQUALS STA. 0.00 IN ROSS CO.	.00			

2004 PIKE CO 2
AVERAGE 24-HR TRAFFIC VOLUME

	SECT. BEGINS	TRAFFIC SECTION	SECT. LENGTH	PASS & A COM'L	B & C COM'L	TOTAL VEH.
		SR-124				
	00.00	HIGHLAND CO. LINE	7.51	1440	210	1650
	07.51	C-6 (LAPPERALL RD.)	7.37	4140	330	4470
	14.88	SR 772	2.24	3120	340	3460
	17.12	SR 32	18.40	SEE PREFERRED ROUTE		
	35.52	EQUALS STA. 0.00 IN JACKSON CO.	.00			
		SR-220				
	00.00	SR 772	4.08	2530	70	2600
	04.20	SR 551	1.31	3480	60	3540
	05.51	SR 552	1.67	2640	70	2710
U	07.20	W. CORP. WAVERLY	1.22	6200	210	6410
U	08.42	US 23 (EMMITT ST.)	.15	3140	60	3200
U	08.57	MARKET ST. ENTER 3RD. ST.	1.13	4530	230	4760
	09.70	S. CORP. WAVERLY	1.42	4530	230	4760
	11.12	C-52 (RIVER RD.)	3.07	4670	230	4900
	14.19	C-116 (BEAVER CREEK RD.)	1.04	3110	60	3170
	15.23	ROUTE ENDS AT SR 32	.00			
		SR-335				
	00.00	SCIOTO CO. LINE	5.25	1290	70	1360
	05.25	SR 32	1.92	1230	50	1280
U	07.17	S. CORP. BEAVER	.05	1230	50	1280
U	07.22	MAIN ST.	.18	2060	100	2160
U	07.40	MAIN ST. ENTER CENTRAL AVE.	.50	720	20	740
	07.90	N. CORP. BEAVER	11.30	720	20	740
	19.20	T-511 (STRAIGHT CREEK RD.)	5.58	1390	20	1410
U	24.78	E. CORP. WAVERLY	1.11	2160	60	2220
U	25.89	MORNINGSIDE DR.	.17	5280	160	5440
	26.06	US 23 ENTER EMMITT ST.	.35	SEE PREFERRED ROUTE		
	26.41	ROUTE ENDS AT SR 220 IN WAVERLY	.00			
		SR-551				
	00.00	SR 220	2.53	440	10	450
	02.53	C-92 (RITTENOUR RD.)	.34	1410	30	1440
	02.87	ROUTE ENDS AT SR 104	.00			

Threshold Calculations

						Points
Frequency	=	total # crashes	=	27		
Density	=	Frequency (for intersections)	=	27		2
Crash Rate	=	(# crashes)(1 million) / (365)(3)(ADT)(Length in miles) ↓ (sections only)	=	(27)(1,000,000) / (365)(3)(8480)	= 2.91	4
Rate of Return	,	From Economic Analysis Sheet	=	15.68%		2
EPDO	=	PDO (10)(1.0) = 10 Injuries (16)(6.9) = 110.4 Fatalities (1) (292.9) = 292.9 Total = 413.3				
EPDO Rate	=	(EPDO)(1 million) / (365)(3)(ADT)(Length in miles) ↓ (sections only)	=	(413.3)(1,000,000) / (365)(3)(8480)	= 44.51	5

RSI

Rural	Cost			
Angle (06)	$2,849	,	(24 crashes)($2,849)	= $68,376
SS Meeting (04)	$2,069	,	(2 crashes)($2069)	= $4,138
RearEnd (02)	$2,065	,	(1 crash)($2065)	= $2,065
			Total	= $74,579

= Total / # crashes = $74,579 / 27 = $2,762 — **15**

% Trucks	=	1150 / 8480	=	13.56%		2
					Total	30

RATE OF RETURN - ECONOMIC ANALYSIS WORKSHEET

Cells in Yellow Require User Input

Click to Clear Sample Information

Ohio Department of Transportation
Office of Roadway Safety and Mobility

5,000 Crash Record Analysis Limit

County: PIK | Main Roadway: 0032 | Begin SLM: 19.9 | End SLM: 20.1
Intersecting Roadway:
Prepared by: | Date: 3/13/2006 | Crash BDate: 20020101 | Crash EDate: 20041231

Year	TIME OF DAY						ROADWAY CONDITION						CRASH TYPE																	
	DAY		DAWN/DUSK		DARK		DRY		WET		SNOW / ICE		REAR END		LEFT		RIGHT		ANGLE		HEAD ON		SS PASS		FIXED OBJ		RAN OFF RD		PEDESTRIAN		OTHER	
	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F	PDO	I/F
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	5	5	0	0	0	1	3	5	2	1	0	0	0	0	0	0	1	1	4	5	0	0	0	0	0	0	0	0	0	0	0	0
2003	3	3	0	0	1	0	4	2	0	1	0	0	1	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0
2004	1	7	0	0	0	1	0	8	1	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	1	0
2005	0	0	0	0	0	0	0	0	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	9	15	0	0	1	2	7	15	3	2	0	0	1	0	0	0	1	1	7	16	0	0	0	0	0	0	0	0	0	0	1	0
AVG.	3.0	5.0	0.0	0.0	0.3	0.7	2.3	5.0	1.0	0.7	0.0	0.0	0.3	0.0	0.0	0.0	0.3	0.3	2.3	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0

--The "TOTAL" and "AVERAGE" row formulas are set to only use 2002-2004 crash data. If the crash data is not for these three years, the formulas must be modified by the user to calculate the associated year data.

RECOMMENDED IMPROVEMENTS

Select Countermeasures

R1: 51 Relocate intersection
R2: 24 Install traffic signal - all types
R3:
R4:

CRASH TYPE	PDO CRASHES R1	R2	R3	R4	RT	AVG PDO	EST. RED.	INJ. - FAT. CRASHES R1	R2	R3	R4	RT	AVG INJ-FAT	EST. RED.
LEFT	0.25	0.1			0.325	0.00	0.00	0.25	0.1			0.325	0.00	0.00
RIGHT	0.25	0.1			0.325	0.33	0.11	0.25	0.1			0.325	0.33	0.11
ANGLE	0.25	0.8			0.85	2.33	1.98	0.25	0.8			0.85	5.33	4.53
REAR END	0.25	-0.1			0.175	0.33	0.06	0.25	-0.1			0.175	0.00	0.00
HEAD ON	0.25				0.25	0.00	0.00	0.25				0.25	0.00	0.00
SS PASS	0.25	0.1			0.325	0.00	0.00	0.25	0.1			0.325	0.00	0.00
FIXED OBJ	0.25				0.25	0.00	0.00	0.25				0.25	0.00	0.00
RAN OFF RD	0.25				0.25	0.00	0.00	0.25				0.25	0.00	0.00
OTHER	0.25				0	0.33	0.00	0.25				0.25	0.00	0.00
NIGHT					0	0.33	0.00					0	0.67	0.00
WET					0	1.00	0.00					0	0.67	0.00
PEDESTRIAN					0	0.00	0.00					0	0.00	0.00
					ESTIMATED PDO CRASH REDUCTION =		2.15					ESTIMATED INJ. - FAT. CRASH REDUCTION =		4.64

ADT Factor

Project Service Life: 20 years
Present ADT (PADT): 8500 veh / day
Future ADT (FADT): 11448 veh / day

Average ADT = (PADT + FADT)/2 = (8500 + 11448) = 9974
ADT Factor = Average ADT / PADT = 9974 / 8500 = 1.17

Average Annual Benefits

Annual PDO Benefits = Estimated PDO Crash Reduction * Avg PDO Cost

Select Facility Type Below: Rural State Highways

= 2.15 * $ 7,407.00 = $ 15,925.05

Annual INJ.-FAT. Benefits = Estimated INJ.-FAT. Crash Reduction * Avg INJ.-FAT. Cost

= 4.64 * $ 76,371.00 = $ 354,488.73

Total Benefits = $ 370,413.78

AverageAnnual Benefits = Total Benefits * ADT Factor

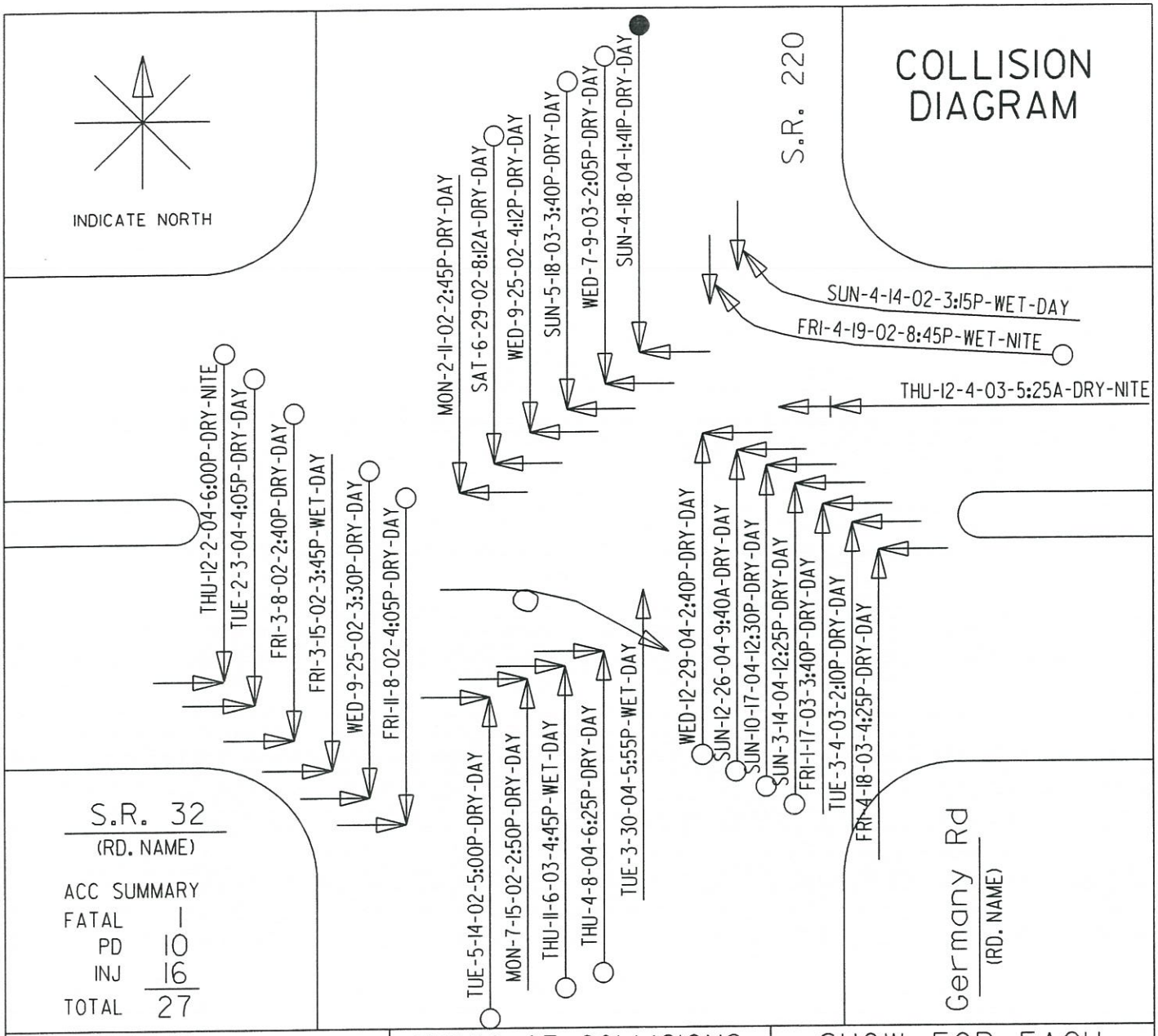
= 1.17 * $ 370,413.78 = **$ 434,647.88**

Rate of Return

Project Cost	$2,939,038
Maintenance and Energy Costs	$5,000
Salvage Value	

Rate of Return: **13.45%**

COLLISION DIAGRAM



SYMBOLS

- MOVING VEHICLE
- BACKING VEHICLE
- NON-INVOLVED VEHICLE
- PEDESTRIAN
- PARKED VEHICLE
- FIXED OBJECT
- FATAL ACCIDENT
- INJURY ACCIDENT

TYPES OF COLLISIONS

- REAR END
- HEAD ON
- SIDE SWIPE
- OUT OF CONTROL
- LEFT TURN
- RIGHT ANGLE

SHOW FOR EACH ACCIDENT

1. DAY, DATE, AND TIME
2. WEATHER AND ROAD SURFACE - IF UNUSUAL CONDITION EXISTED
3. NITE - IF BETWEEN DUSK AND DAWN

INTERSECTION S.R. 32 AND S.R. 220

PERIOD 3 YEARS : FROM 1-1-02 TO 12-31-04

PIK-0032R - (19.9-20.1) From 01/01/2002 to 12/31/2004

	Number
Total	**27**

CRASH_SEVERITY	Number	%
FATAL CRASH	1	3.7%
INJURY CRASH	16	59.3%
PROPERTY DAMAGE CRASH	10	37.0%
Grand Total	**27**	**100.0%**

DAY_OF_WEEK	Number	%
SUNDAY	6	22.2%
FRIDAY	6	22.2%
WEDNESDAY	4	14.8%
TUESDAY	4	14.8%
THURSDAY	4	14.8%
MONDAY	2	7.4%
SATURDAY	1	3.7%
Grand Total	**27**	**100.0%**

TRAFFIC_CRASH_YEAR	Number	%
2002	11	40.7%
2003	7	25.9%
2004	9	33.3%
Grand Total	**27**	**100.0%**

HOUR_OF_DAY	Number	%
05	1	3.7%
08	1	3.7%
09	1	3.7%
12	2	7.4%
13	1	3.7%
14	6	22.2%
15	5	18.5%
16	5	18.5%
17	2	7.4%
18	2	7.4%
20	1	3.7%
Grand Total	**27**	**100.0%**

TYPE_OF_CRASH	Number	%
ANGLE	23	85.2%
RIGHT TURN	2	7.4%
OTHER NON-COLLISION	1	3.7%
REAR END	1	3.7%
Grand Total	**27**	**100.0%**

WEATHER_CONDITION	Number	%
NO ADVERSE WEATHER CONDITION	21	77.8%
RAIN	5	18.5%
FOG	1	3.7%
Grand Total	**27**	**100.0%**

ROAD_CONDITION	Number	%
ROAD - DRY	22	81.5%
ROAD - WET	5	18.5%
Grand Total	**27**	**100.0%**

LIGHT_CONDITION	Number	%
DAYLIGHT	24	88.9%
DARK - NO LIGHTS	3	11.1%
Grand Total	**27**	**100.0%**

NUMBER_OF_VEHICLES	Number	%
2	25	92.6%
3	2	7.4%
Grand Total	**27**	**100.0%**

LOCATION	Number	%
INTERSECTION	27	100.0%
Grand Total	**27**	**100.0%**

MONTH	Number	%
01	1	3.7%
02	2	7.4%
03	5	18.5%
04	5	18.5%
05	2	7.4%
06	1	3.7%
07	2	7.4%
09	2	7.4%
10	1	3.7%
11	2	7.4%
12	4	14.8%
Grand Total	**27**	**100.0%**

ROAD_CONTOUR	Number	%
STRAIGHT - LEVEL	13	48.1%
STRAIGHT - GRADE	9	33.3%
CURVE - GRADE	4	14.8%
CURVE - LEVEL	1	3.7%
Grand Total	**27**	**100.0%**

VIOLATOR_CD	Number	%
01	26	96.3%
98	1	3.7%
Grand Total	**27**	**100.0%**

SPECIAL_AREA	Number	%
SPECIAL AREA - NOT STATED	27	100.0%
Grand Total	**27**	**100.0%**

ANIMAL_TYPE	Number	%
ANIMAL NOT STATED	27	100.0%
Grand Total	**27**	**100.0%**

ACTION1	Number	%
GOING STRAIGHT	21	77.8%
TURNING RIGHT	2	7.4%
PARKING/UNPARKING	2	7.4%
OTHER ACTION	1	3.7%
TURNING LEFT	1	3.7%
Grand Total	**27**	**100.0%**

CONTRIBUTING_FACTOR1	Number	%
FAILURE TO YIELD	22	81.5%
FAILURE TO CONTROL	2	7.4%
NO DRIVER ERRORS	1	3.7%
FOLLOWING TOO CLOSE	1	3.7%
LEFT OF CENTER	1	3.7%
Grand Total	**27**	**100.0%**

OBJECT_STRUCK1	Number	%
NOTHING STRUCK	26	96.3%
TRAFFIC SIGN	1	3.7%
Grand Total	**27**	**100.0%**

TRAFFIC_CONTROL1	Number	%
STOP SIGN	22	81.5%
PAVEMENT MARKINGS	3	11.1%
NO TRAFFIC CONTROL DRIVER	1	3.7%
OTHER TRAFFIC CONTROL	1	3.7%
Grand Total	**27**	**100.0%**

DRIVER_ALCOHOL1	Number	%
NO ALCOHOL DETECTED	24	88.9%
HDB - ABILITY UNKNOWN	2	7.4%
HDB - ABILITY IMPAIRED	1	3.7%
Grand Total	**27**	**100.0%**

DRIVER_DRUGS1	Number	%
NO DRUGS DETECTED	25	92.6%
DRUGS NOT STATED	2	7.4%
Grand Total	**27**	**100.0%**

DIRECTION_FROM1	Number	%
SOUTH	12	44.4%
NORTH	11	40.7%
EAST	4	14.8%
Grand Total	**27**	**100.0%**

DIRECTION_TO1	Number	%
NORTH	14	51.9%
SOUTH	10	37.0%
WEST	2	7.4%
EAST	1	3.7%
Grand Total	**27**	**100.0%**

POSTED_SPEED1	Number	%
POSTED 55	16	59.3%
POSTED OVER 55	9	33.3%
POSTED SPEED NOT STATED	1	3.7%
POSTED 50	1	3.7%
Grand Total	**27**	**100.0%**

ESTIMATED_SPEED1	Number	%
SPEED 20 AND UNDER	16	59.3%
SPEED 26-35	4	14.8%
VEHICLE SPEED NOT STATED	3	11.1%
SPEED 21-25	2	7.4%
SPEED 46-55	1	3.7%
SPEED 56-65	1	3.7%
Grand Total	**27**	**100.0%**

VEHICLE_TYPE1	Number	%
MID-SIZE	10	37.0%
OTHER VEHICLE	5	18.5%
FULL-SIZE	3	11.1%
COMPACT	3	11.1%
PICKUP TRUCK	2	7.4%
PANEL TRUCK	2	7.4%
PUBLIC BUS	1	3.7%
STRAIGHT TRUCK	1	3.7%
Grand Total	**27**	**100.0%**

VEHICLE_TYPE2	Number	%
PICKUP TRUCK	7	25.9%
OTHER VEHICLE	7	25.9%
MID-SIZE	7	25.9%
COMPACT	3	11.1%
FULL-SIZE	3	11.1%
Grand Total	**27**	**100.0%**

ACTION2	Number	%
GOING STRAIGHT	24	88.9%
STOPPED IN TRAFFIC	2	7.4%
TURNING RIGHT	1	3.7%
Grand Total	**27**	**100.0%**

CONTRIBUTING_FACTOR2	Number	%
NO DRIVER ERRORS	25	92.6%
FAILURE TO CONTROL	1	3.7%
FAILURE TO YIELD	1	3.7%
Grand Total	**27**	**100.0%**

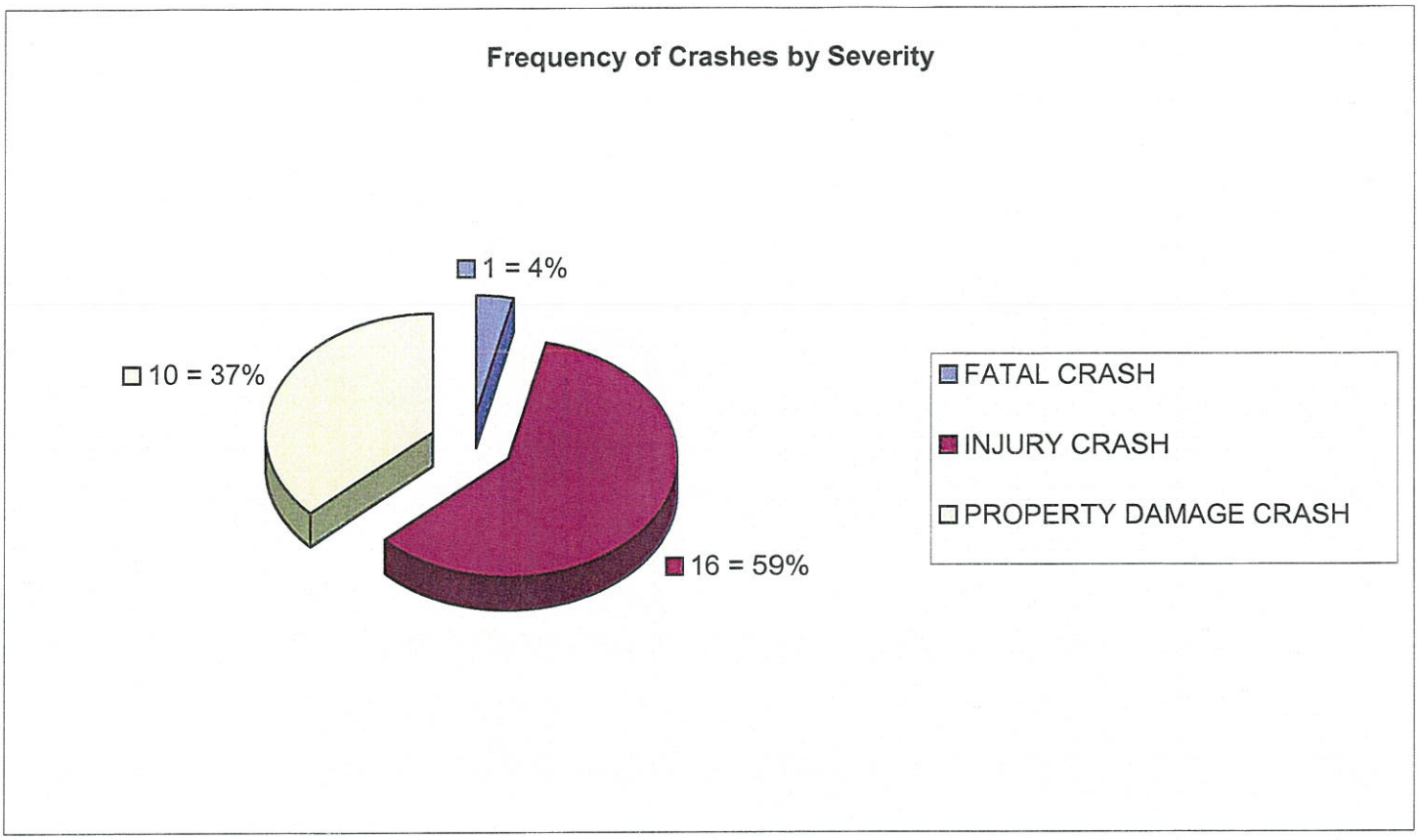
DIRECTION_FROM2	Number	%
EAST	13	48.1%
WEST	11	40.7%
NORTH	3	11.1%
(blank)		0.0%
Grand Total	**27**	**100.0%**

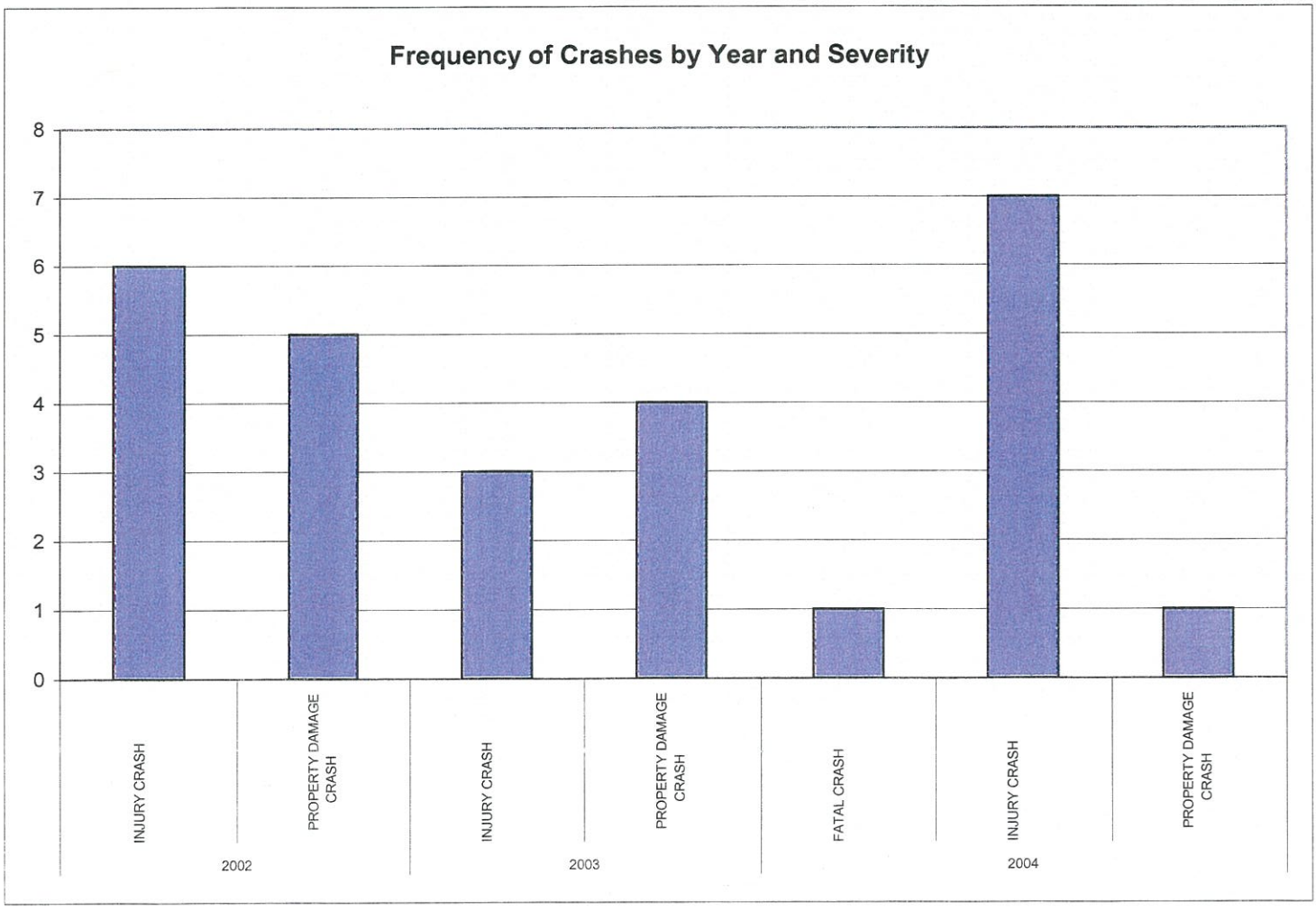
DIRECTION_TO2	Number	%
WEST	12	44.4%
EAST	11	40.7%
SOUTH	3	11.1%
NORTH	1	3.7%
(blank)		0.0%
Grand Total	**27**	**100.0%**

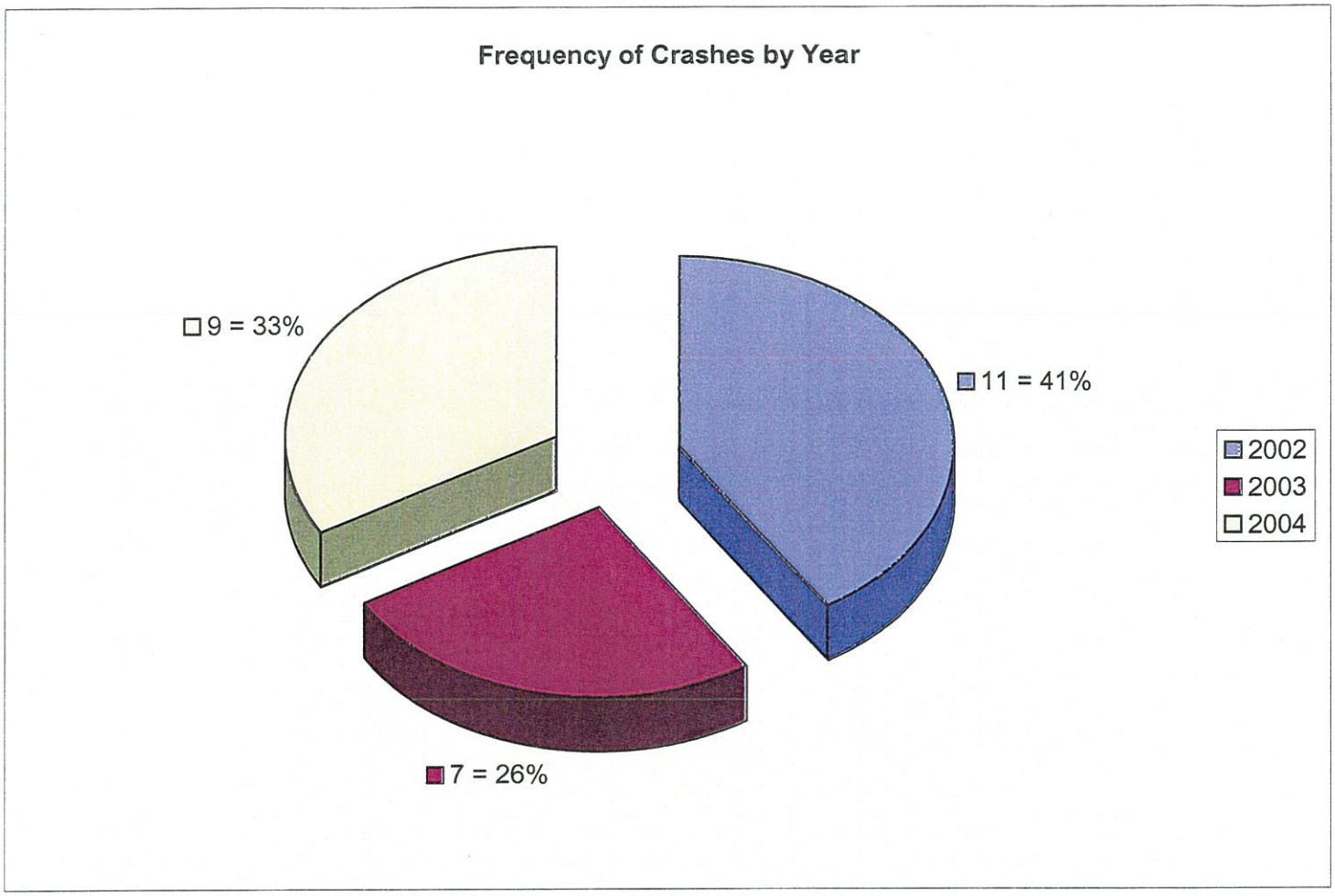
DRIVER_ALCOHOL2	Number	%
NO ALCOHOL DETECTED	27	100.0%
Grand Total	**27**	**100.0%**

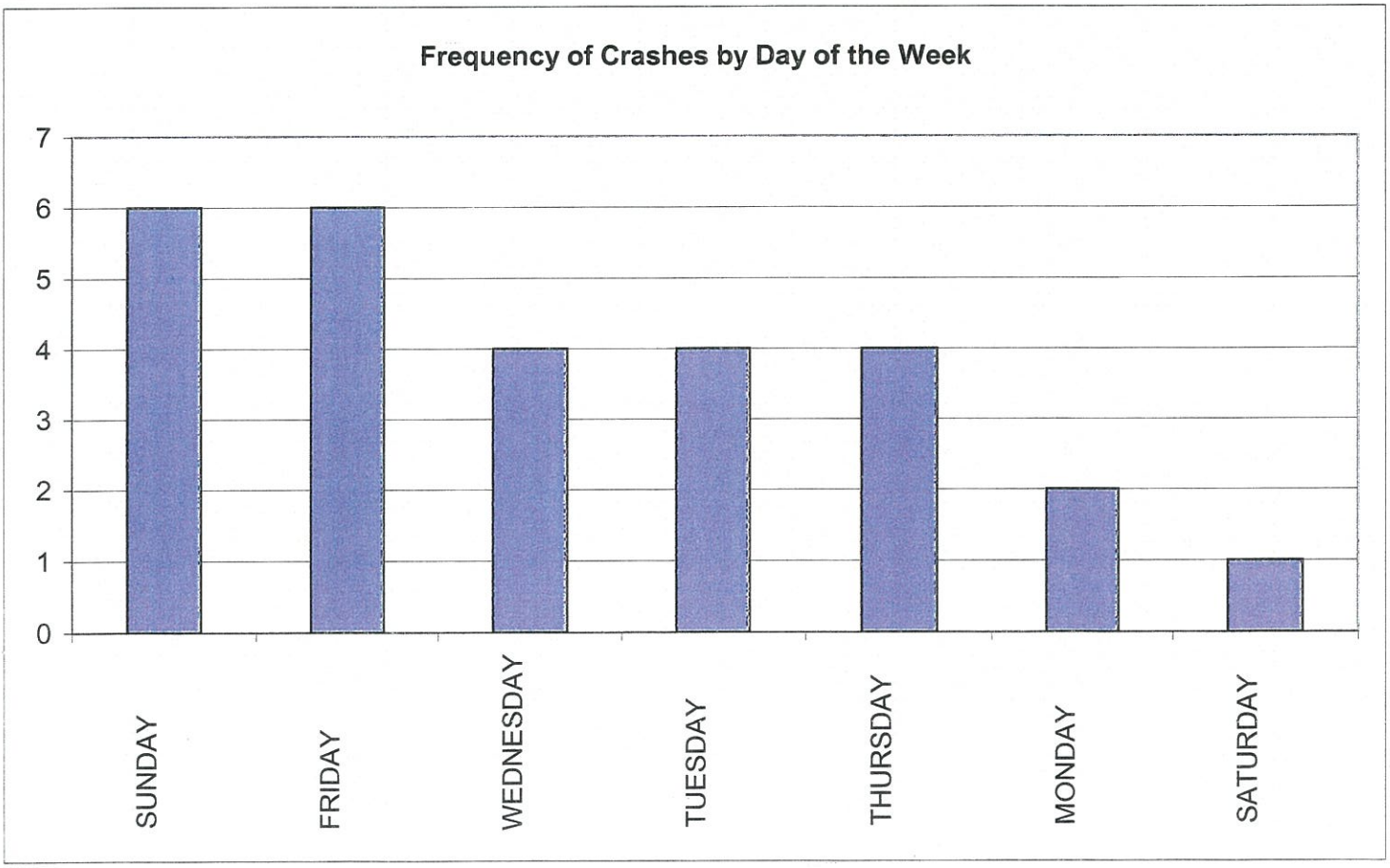
DRIVER_DRUGS2	Number	%
NO DRUGS DETECTED	27	100.0%
Grand Total	**27**	**100.0%**

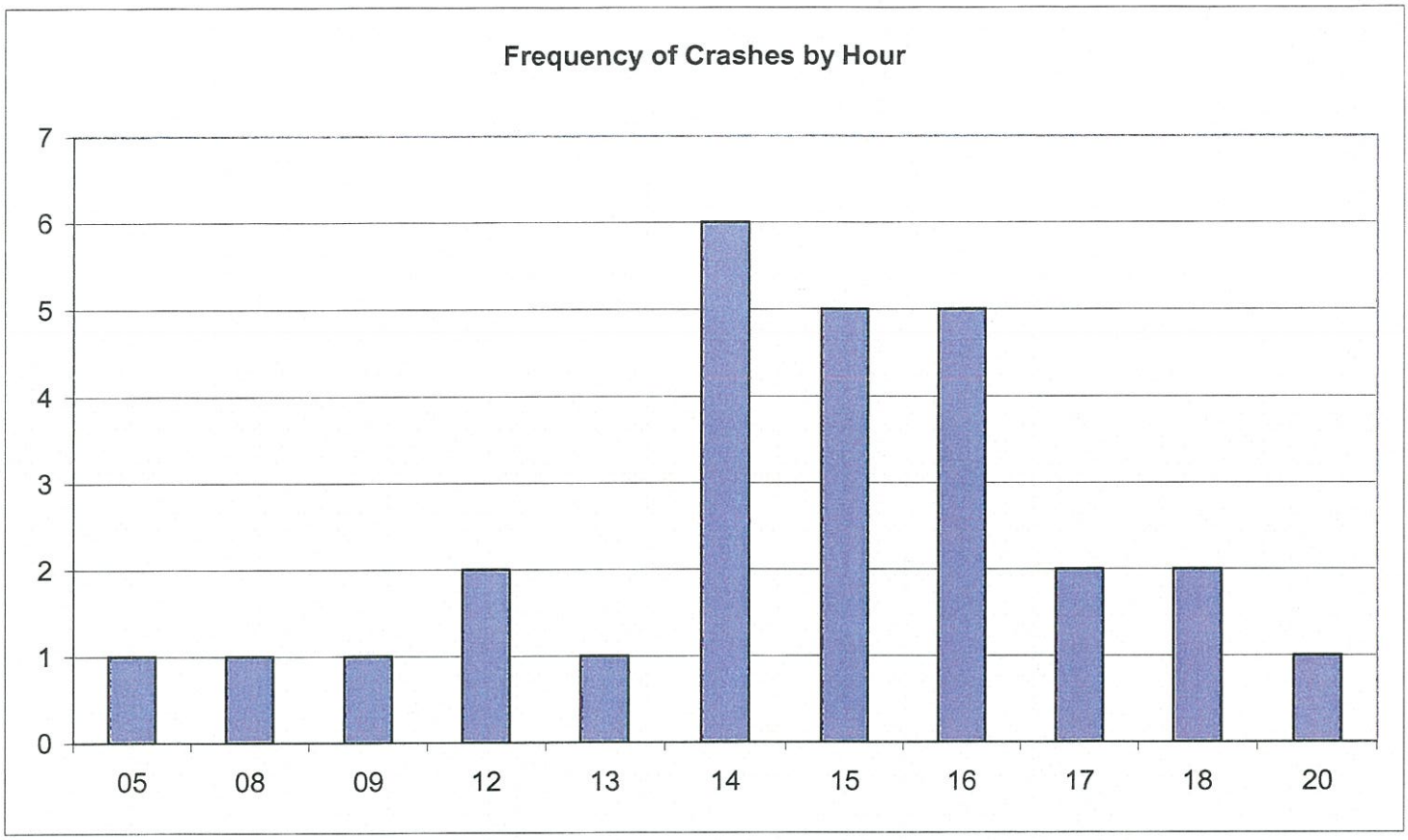
PIK-0032R - (19.9-20.1) From 01/01/2002 to 12/31/2004

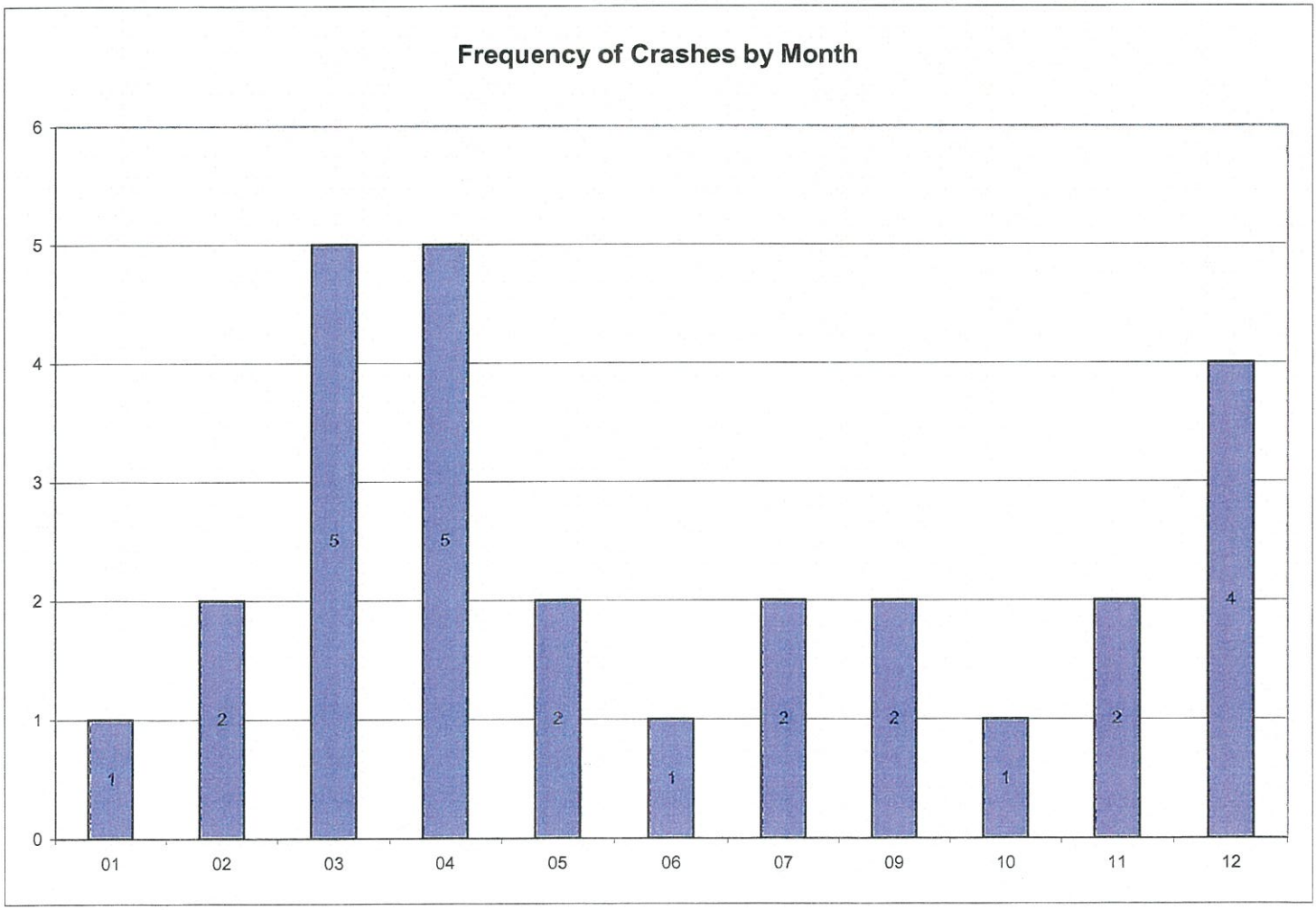


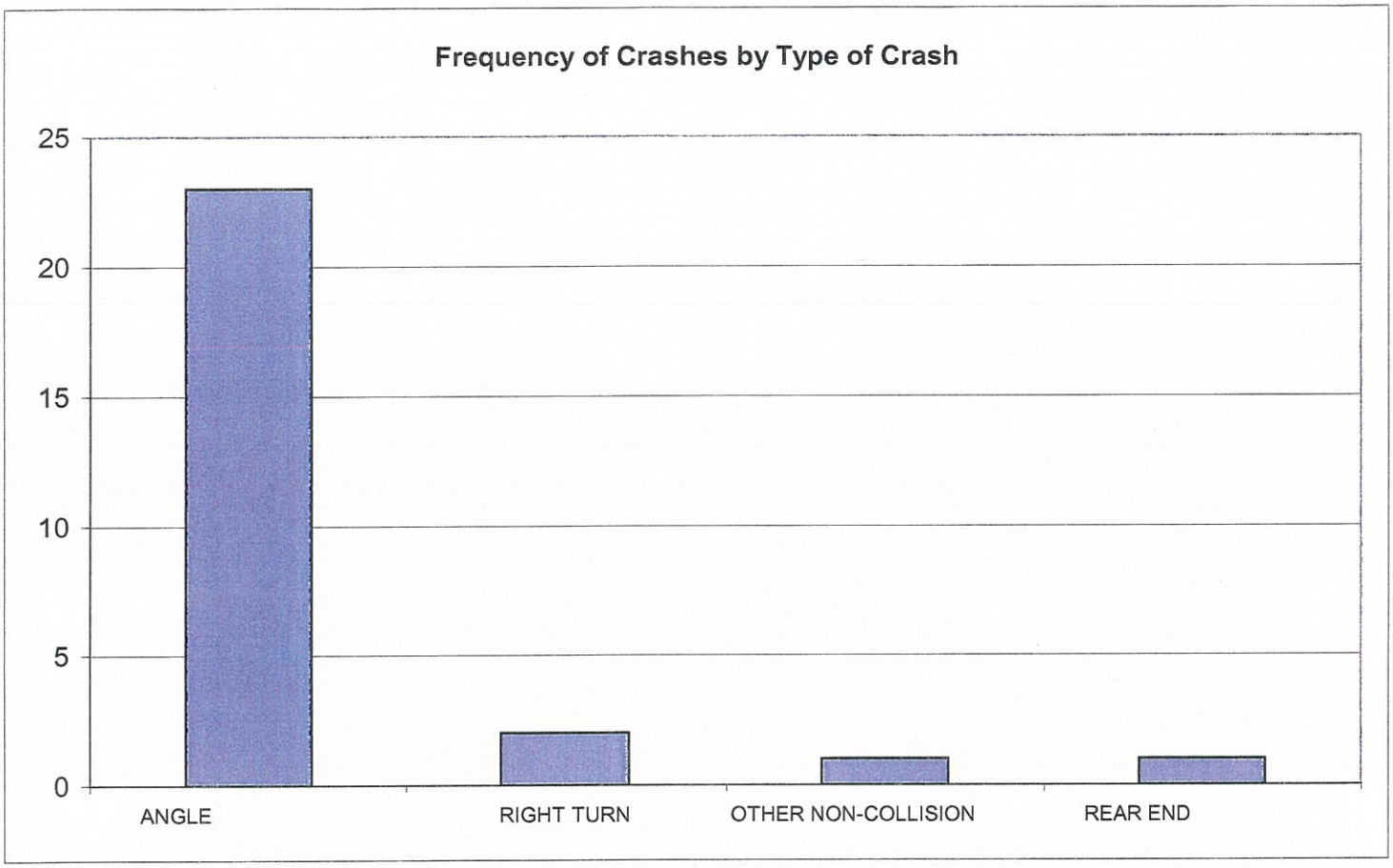


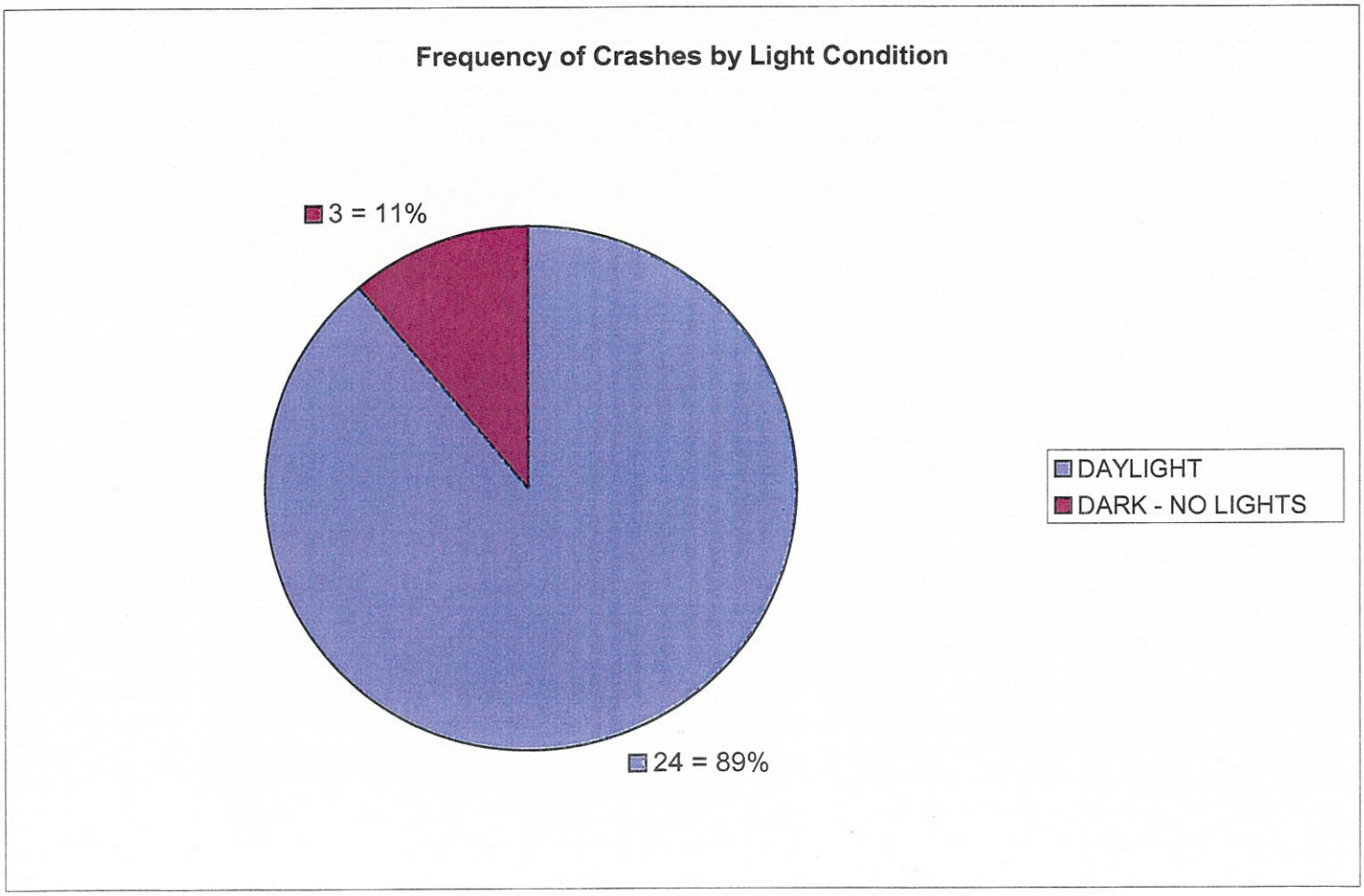

Frequency of Crashes by Year
9 = 33%
11 = 41%
7 = 26%
2002
2003
2004

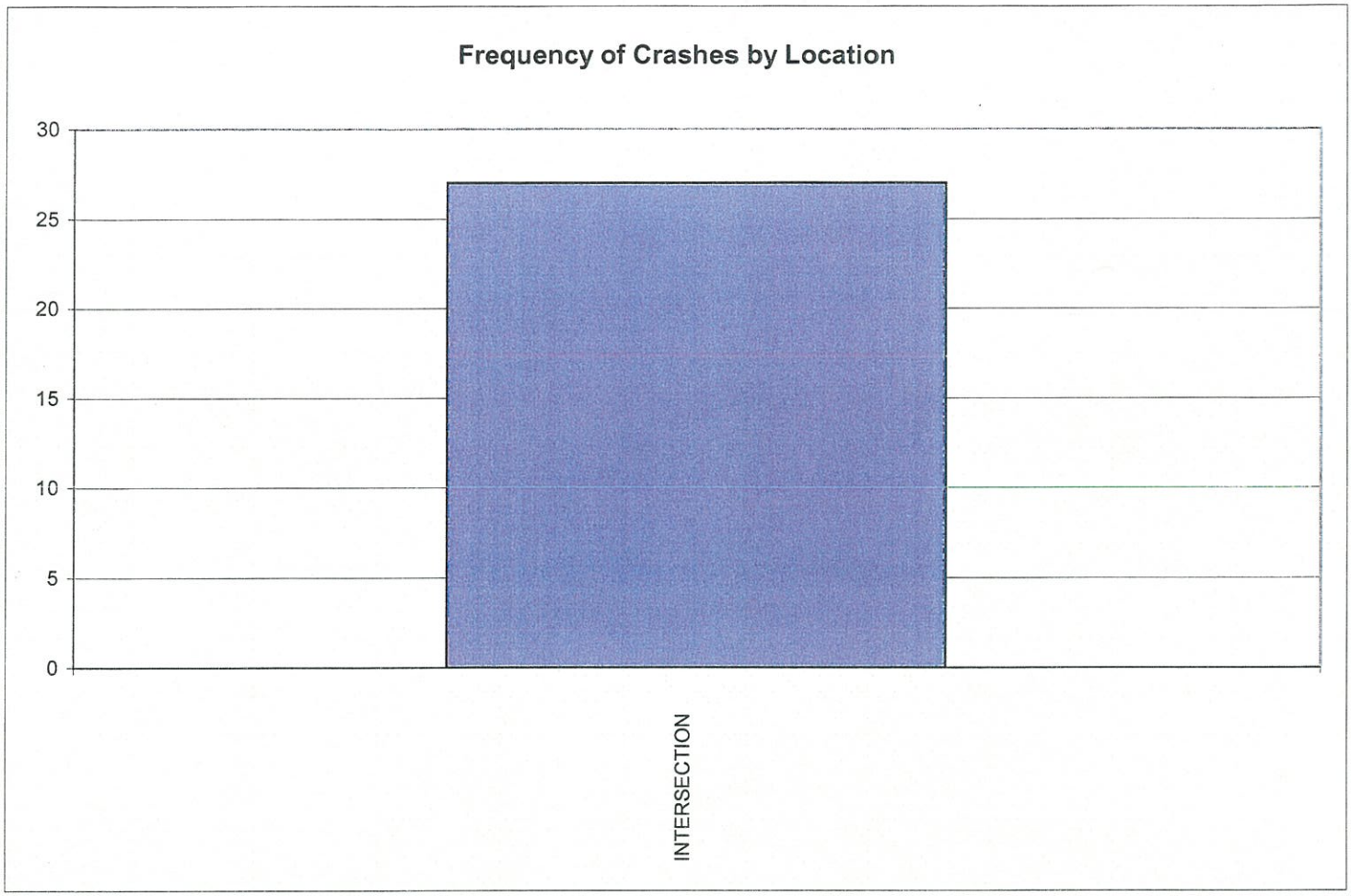

Frequency of Crashes by Day of the Week
7
6
5
4
3
2
1
0
SUNDAY
FRIDAY
WEDNESDAY
TUESDAY
THURSDAY
MONDAY
SATURDAY

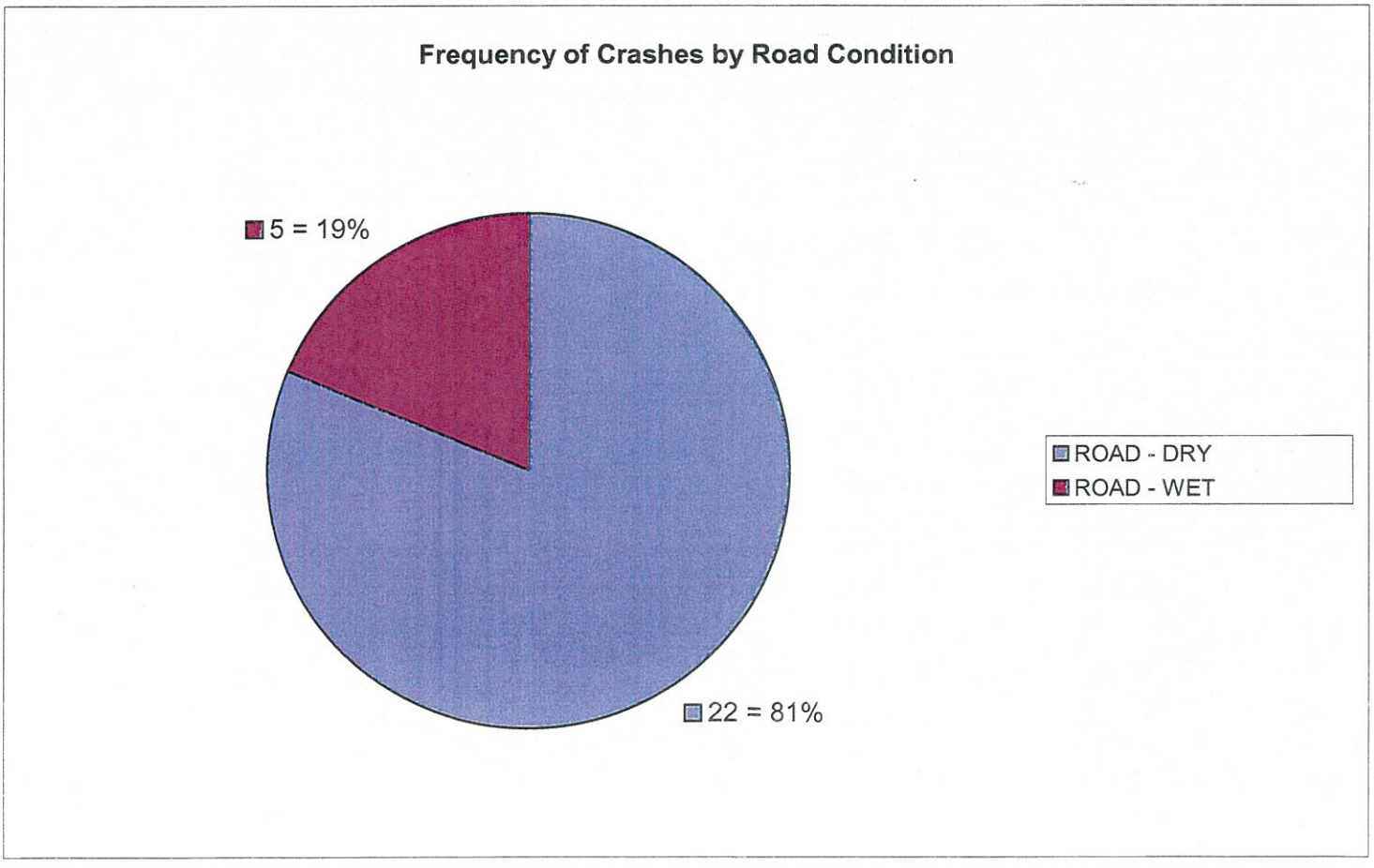

Frequency of Crashes by Hour
7
6
5
4
3
2
1
0
05
08
09
12
13
14
15
16
17
18
20


Frequency of Crashes by Month
6
5
4
3
2
1
0
1
2
5
5
2
1
2
2
1
2
4
01
02
03
04
05
06
07
09
10
11
12

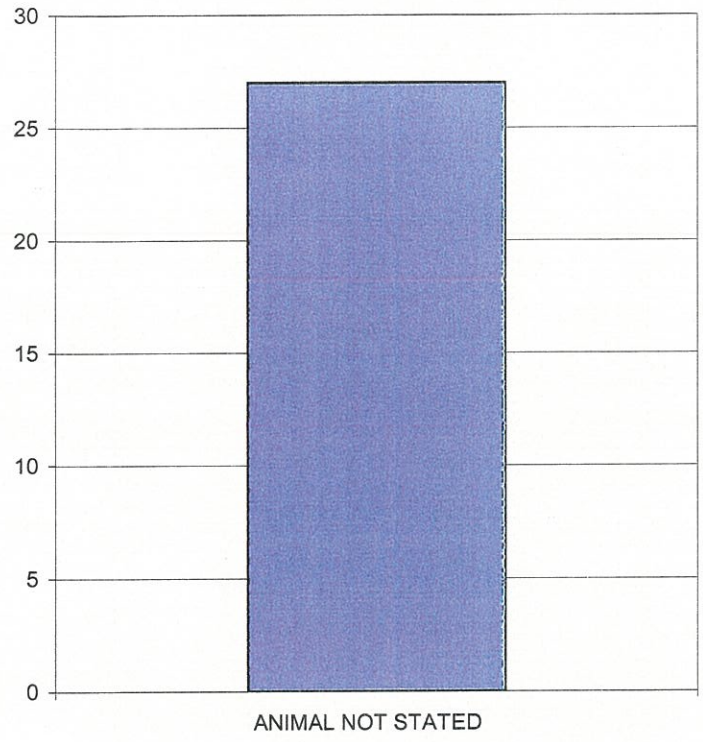

Frequency of Crashes by Type of Crash
25
20
15
10
5
0
ANGLE
RIGHT TURN
OTHER NON-COLLISION
REAR END


Frequency of Crashes by Light Condition
3 = 11%
24 = 89%
DAYLIGHT
DARK - NO LIGHTS

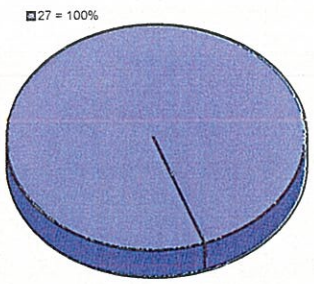

Frequency of Crashes by Location
30
25
20
15
10
5
0
INTERSECTION


Frequency of Crashes by Road Condition
5 = 19%
22 = 81%
ROAD - DRY
ROAD - WET

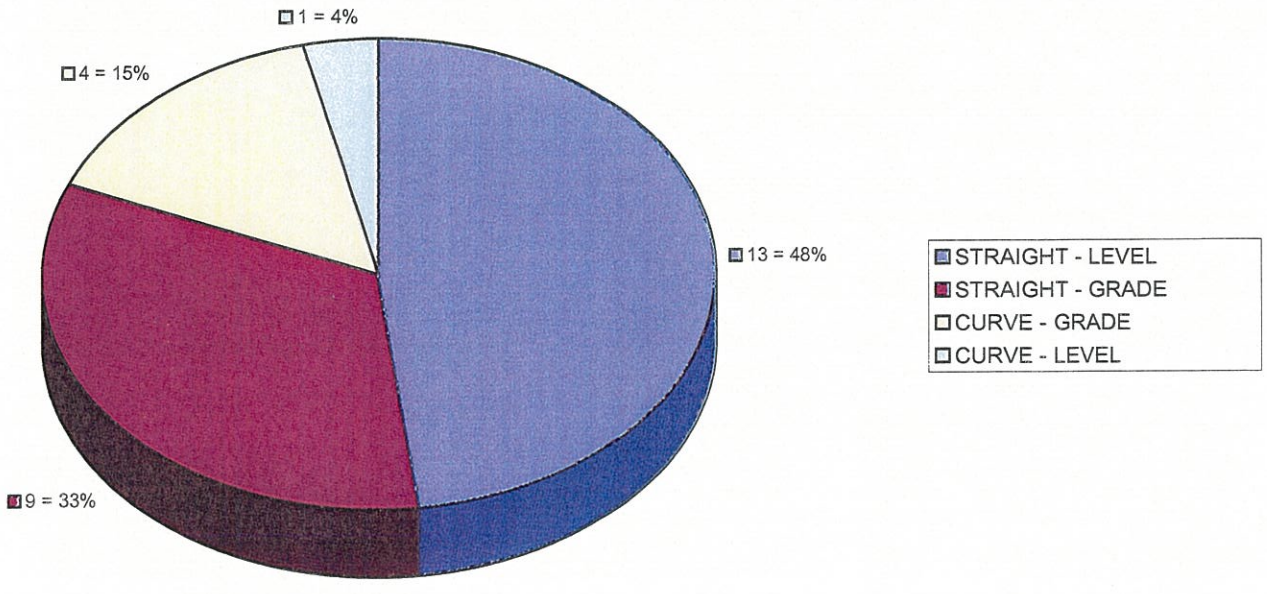
Frequency of Animal Crashes

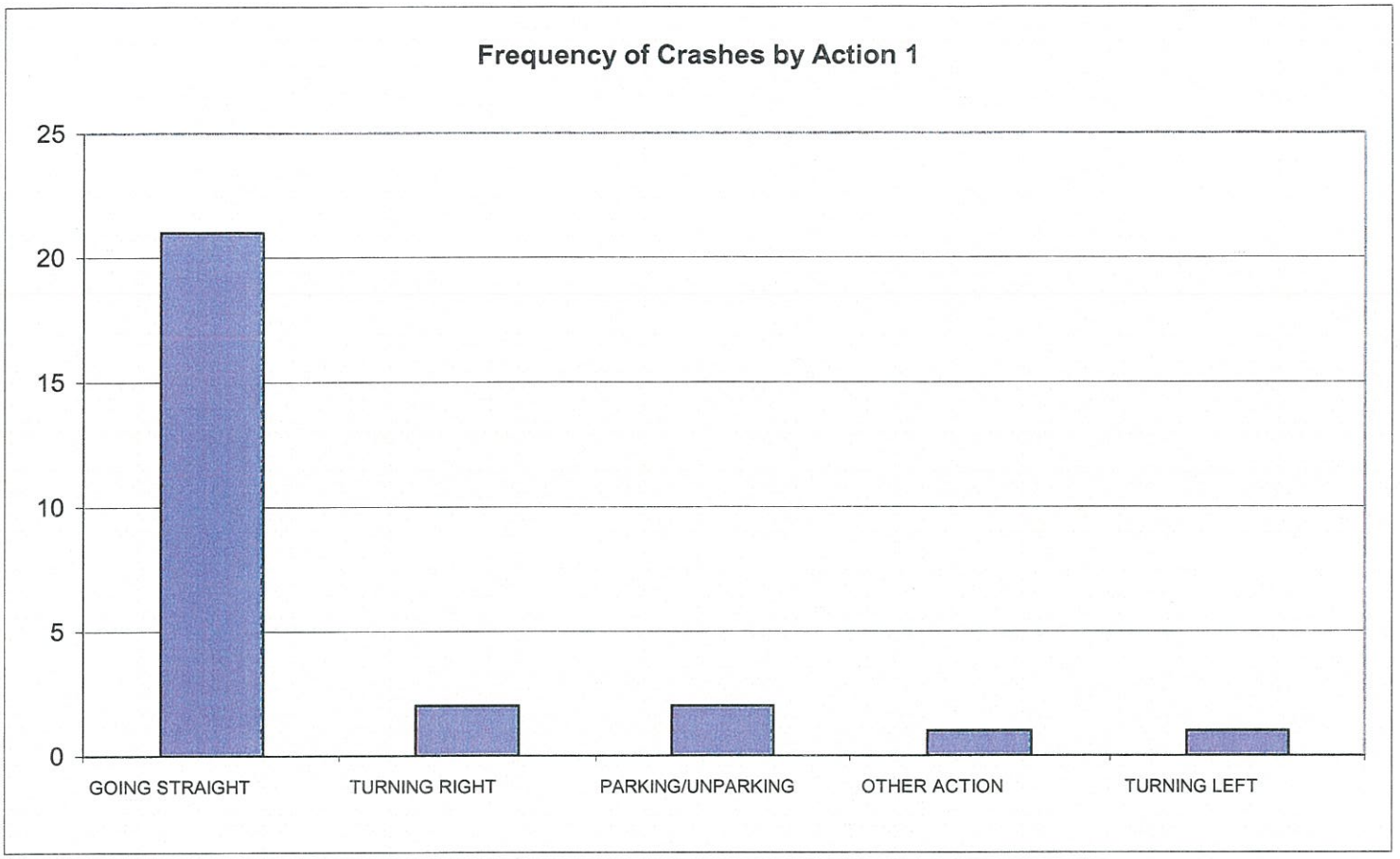


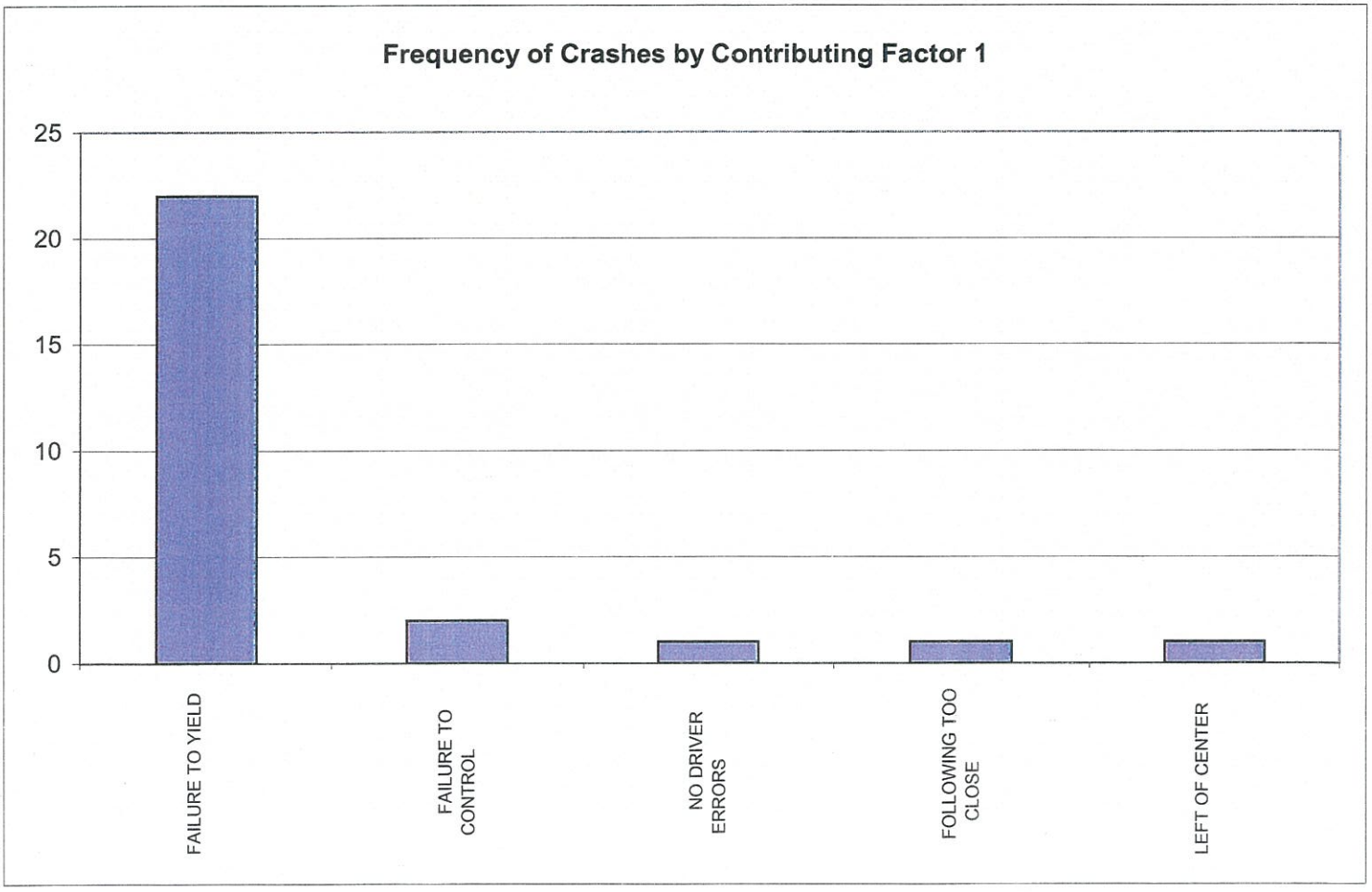
Frequency of Work Zone Crashes

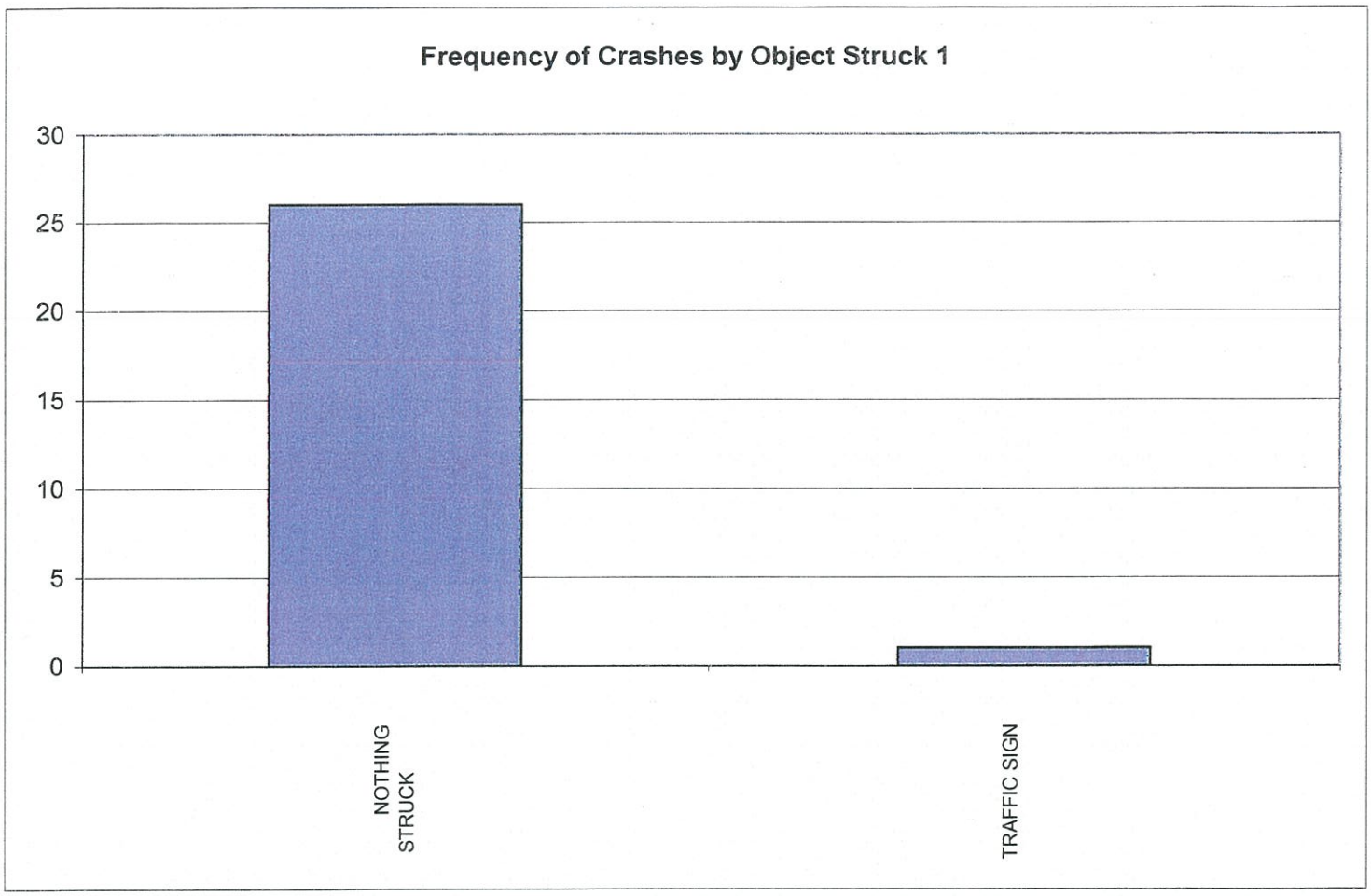


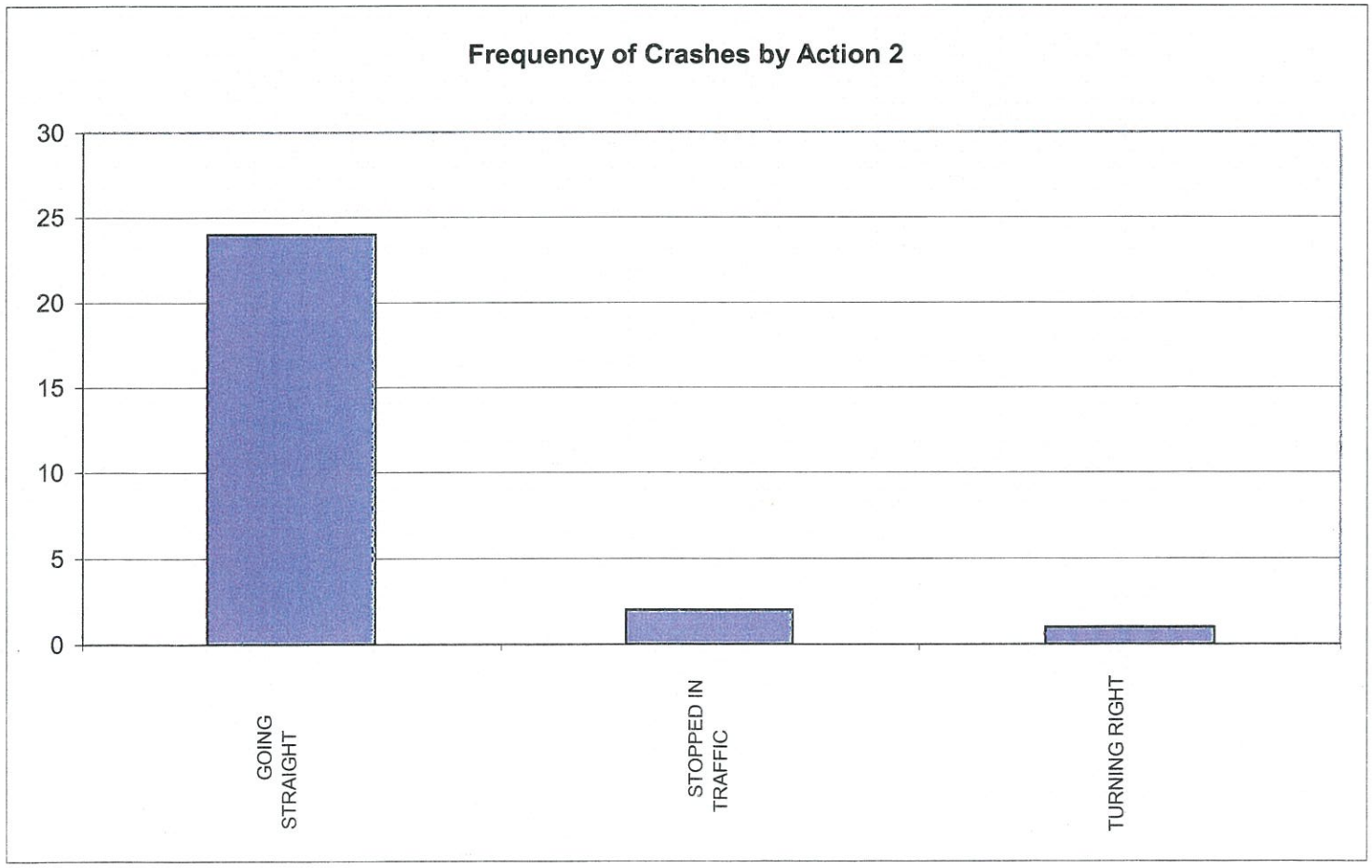
Frequency of Crashes by Road Contour

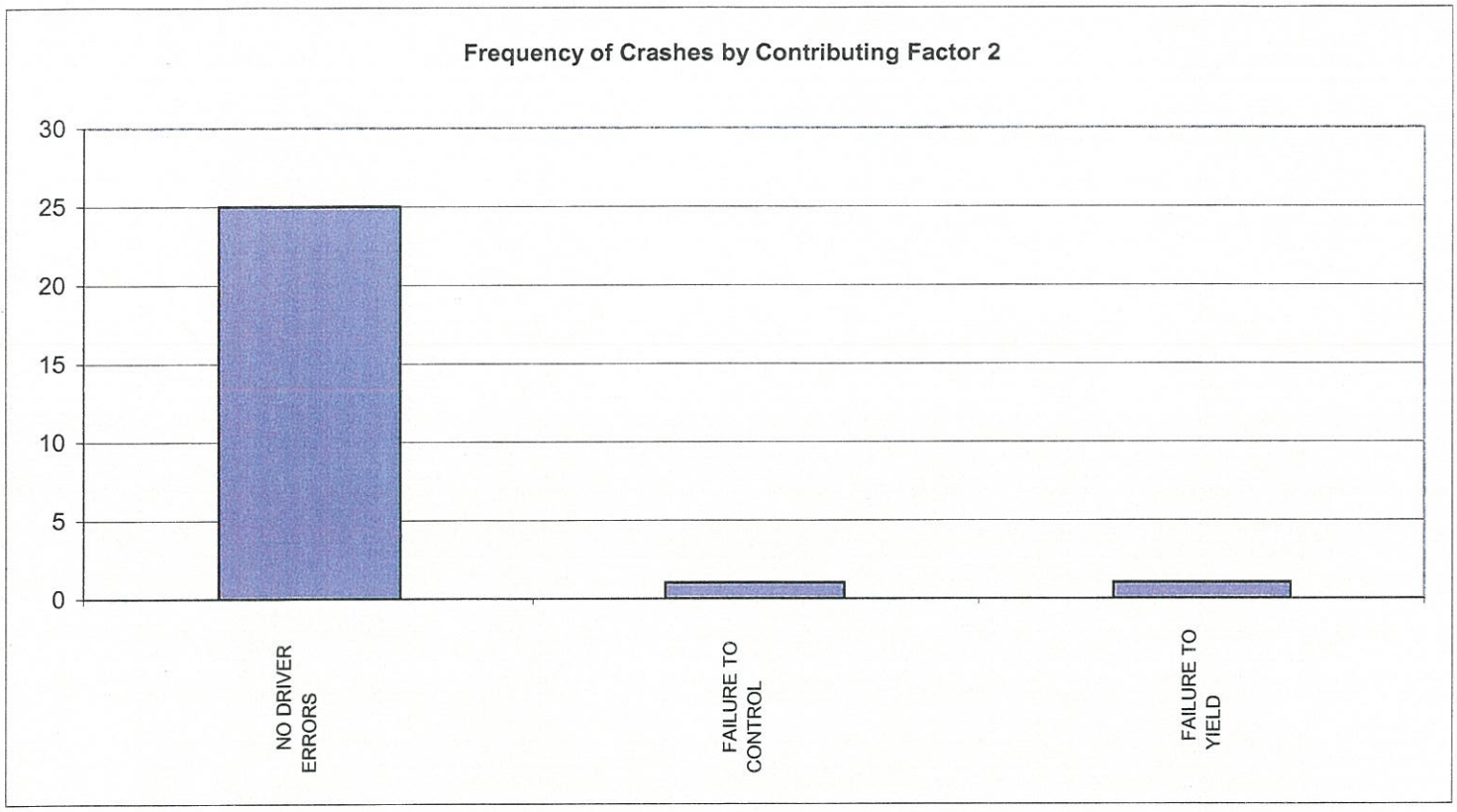


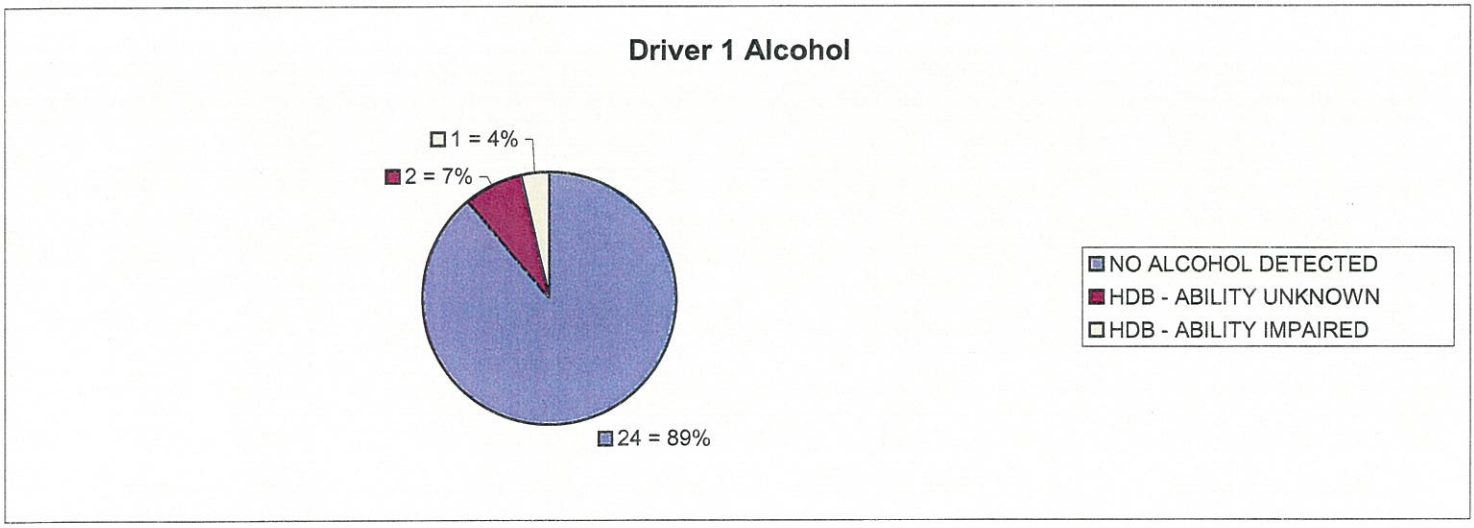

Frequency of Crashes by Action 1
25
20
15
10
5
0
GOING STRAIGHT
TURNING RIGHT
PARKING/UNPARKING
OTHER ACTION
TURNING LEFT

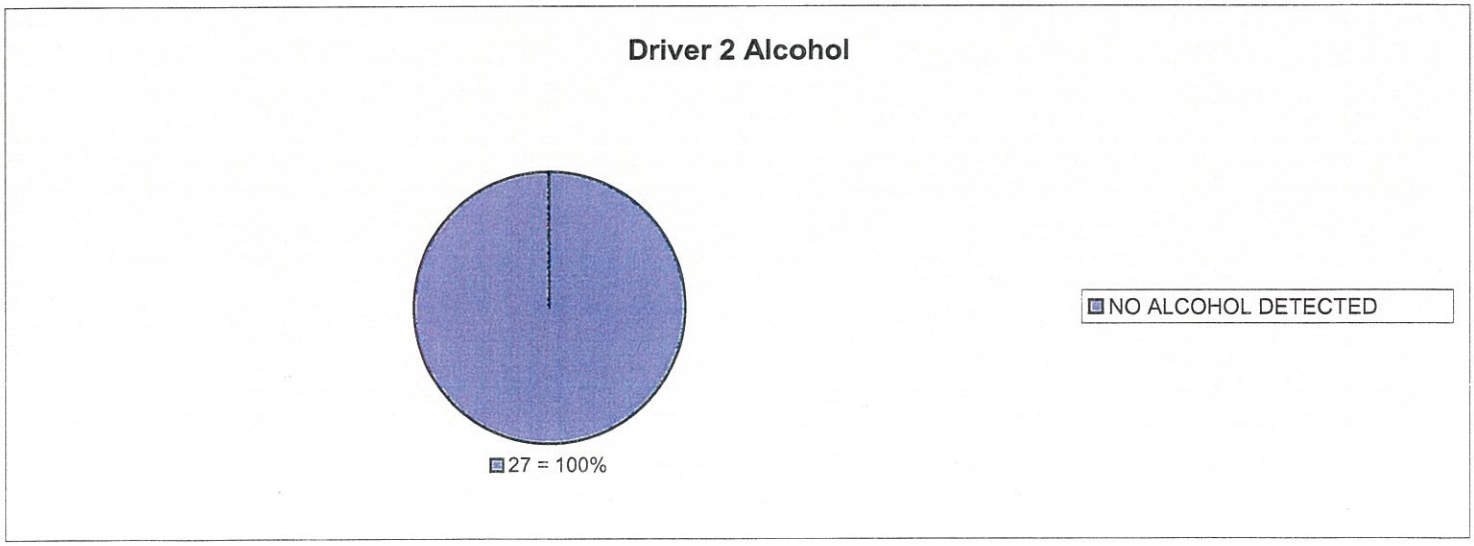

Frequency of Crashes by Contributing Factor 1
25
20
15
10
5
0
FAILURE TO YIELD
FAILURE TO CONTROL
NO DRIVER ERRORS
FOLLOWING TOO CLOSE
LEFT OF CENTER


Frequency of Crashes by Object Struck 1
30
25
20
15
10
5
0
NOTHING STRUCK
TRAFFIC SIGN


Frequency of Crashes by Action 2
30
25
20
15
10
5
0
GOING STRAIGHT
STOPPED IN TRAFFIC
TURNING RIGHT


Frequency of Crashes by Contributing Factor 2
30
25
20
15
10
5
0
NO DRIVER ERRORS
FAILURE TO CONTROL
FAILURE TO YIELD


Driver 1 Alcohol
1 = 4%
2 = 7%
24 = 89%
NO ALCOHOL DETECTED
HDB - ABILITY UNKNOWN
HDB - ABILITY IMPAIRED


Driver 2 Alcohol
27 = 100%
NO ALCOHOL DETECTED

(BEFORE OVERHEAD FLASHERS)

OHIO DEPARTMENT OF HIGHWAYS

BUREAU OF TRAFFIC

SPEED CHECK

RADAR TYPE SPEED METER

Location S.R. 32 @ 220 Intersection (1000' in advance of Intersection)

Date 11-13-00 Day Monday County Pike

Observer R. Chaffin, G. Manson

Type Pavement Bituminous Dry ✓ Wet ____ Condition Good Width 48'

Weather Cloudy Temperature 45°

W bound, Time 9:00 A M to 9:52 A M						E bound, Time 9:00 A M to 9:52 A M				
Cum. %	Cum. Total	No.	Vehicles: Passenger Cars	Vehicles: Commercial	M.P.H.	Vehicles: Passenger Cars	Vehicles: Commercial	No.	Cum. Total	Cum. %
					Over					
					90.0					
					88.0					
					86.0					
					84.0					
					82.0					
					80.0					
					78.0					
100	101	1	I		76.0					
99	100	1	I		74.0					
98	99	2	II		72.0					
96	97	5	𝍸		70.0					
91	92	5	𝍸		68.0	III	II	6	100	100
86	87	6	𝍸	I	66.0	𝍸 III		8	94	94
80	81	19	𝍸 𝍸 𝍸	III	64.0	𝍸 IIII		9	86	86
	62	9	𝍸 III		62.0	𝍸 III	III	12	77	77
	53	15	𝍸 𝍸	𝍸	60.0	𝍸 III	I	10	65	
	38	15	𝍸 𝍸	𝍸	58.0	𝍸 𝍸 𝍸 I	𝍸 II	23	55	
	23	9	𝍸 I	III	56.0	𝍸	𝍸 III	13	32	
	14	6	III	II	54.0	𝍸 𝍸 I	II	13	19	
	8	5	II	III	52.0	III	I	5	6	
					50.0		I	1	1	
	3	2	I	I	48.0					
					46.0					
	1	1		I	44.0					
					42.0					
					40.0					
					38.0					
					36.0					
					34.0					
					32.0					
					30.0					
					28.0					
					26.0					
					24.0					
					22.0					
					20.0					
					18.0					
					16.0					
					14.0					
					Below					
					Totals					

Pace 56-66 mph / 85 Percentile - 65 mph

(AFTER OVERHEAD FLASHERS)

Flasher Installed 10-2-02

OHIO DEPARTMENT OF HIGHWAYS

BUREAU OF TRAFFIC

SPEED CHECK

RADAR TYPE SPEED METER

Location S.R. 32 @ S.R. 220

Date 8-25-04 Day Wednesday County Pike

Observer R. Chaffin, G. Baird

Type Pavement Bituminous Dry ✓ Wet ____ Condition Good Width 4 Lane

Weather Cloudy Temperature 85°

WB bound, Time 12:05 P M to 1:05 P M						EB bound, Time 12:05 P M to 1:05 P M				
Cum. %	Cum. Total	No.	Vehicles: Passenger Cars	Vehicles: Commercial	M.P.H.	Vehicles: Passenger Cars	Vehicles: Commercial	No.	Cum. Total	Cum. %
					Over					
					90.0					
					88.0					
					86.0					
					84.0					
					82.0					
					80.0					
					78.0					
					76.0					
					74.0					
100	120	1	|		72.0					
99	119	3	|||		70.0	|		1	155	100
97	116	8	𝍸 |||		68.0	𝍸 ||		7	154	99
90	108	10	𝍸 𝍸		66.0	𝍸 ||	|	8	147	95
82	98	23	𝍸 𝍸 𝍸 𝍸 ||	|	64.0	𝍸 𝍸 |||	|||	16	139	90
	75	21	𝍸 𝍸 𝍸 𝍸		62.0	𝍸 𝍸 𝍸 𝍸 𝍸 |||	𝍸	38	123	79
	54	19	𝍸 𝍸 ||	𝍸 ||	60.0	𝍸 𝍸 𝍸 𝍸 |||	𝍸 |	29	85	
	35	15	𝍸 𝍸	𝍸	58.0	𝍸 𝍸 𝍸 |||	𝍸 𝍸 |	29	56	
	20	11	𝍸	𝍸 |	56.0	𝍸 |	𝍸 ||	13	27	
	9	6	|||	|||	54.0	𝍸 ||	|	10	14	
	3	2	||		52.0	||	|	3	4	
	1	1	|		50.0	|		1	1	
					48.0					
					46.0					
					44.0					
					42.0					
					40.0					
					38.0					
					36.0					
					34.0					
					32.0					
					30.0					
					28.0					
					26.0					
					24.0					
					22.0					
					20.0					
					18.0					
					16.0					
					14.0					
					Below					
					Totals					

Pace 56 - 66 mph

85 Percentile - 65 mph

Pace 54 - 64 mph

85 Percentile - 63 mph

SIGNAL WARRANT DATA SHEET

Pik 32 & Schuster Rd.

Study By: R. Chaffin Date: 11/12/04 Date of Counts: 10/26/04

Condition A - Minimum Vehicular Volume

Vehicles per hour on **MAJOR** street (total of both approaches)		Vehicles per hour on higher-volume **MINOR**-street approach (one direction only)	
	Combination / Crash Experience		Combination / Crash Experience
70% **420**	56% 336	70% **105**	56% 84

Condition B - Interruption of Continuous Traffic

Vehicles per hour on **MAJOR** street (total of both approaches)		Vehicles per hour on higher-volume **MINOR**-street approach (one direction only)	
	Combination / Crash Experience		Combination / Crash Experience
70% **630**	56% **504**	70% **53**	56% **42**

Comments:

For this analysis, the number of lanes used for moving traffic on each approach for the Major street was 2 or more.

The number of lanes used for moving traffic on each approach for the Minor street was 1.

The volume requirements were reduced 70% since the speed limit on the Major street exceeds 40 mph OR this location is within an isolated community with a population of less than 10,000.

This warrant sheet reflects the traffic volumes with a 3% growth factor and the additional traffic that will be added on the north leg of Schuster Rd if State Route 220 is routed to this intersection.

The peak hour warrant is met without the 3% growth factor.

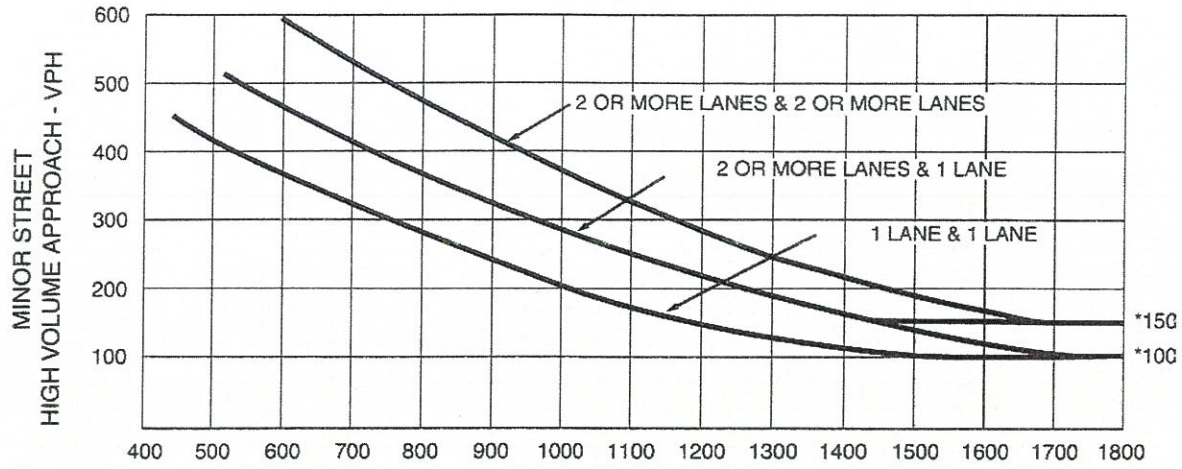
HOUR	MAJOR STREET S.R. 32 Volume	MINOR APPROACH Schuster,north Volume	MINOR APPROACH Schuster,south Volume	Condition A	Condition B	Condition A Crash Experience	Condition B Crash Experience
6-7 AM	511	91	32	NO	NO	YES	YES
7-8 AM	660	213	51	YES	YES	YES	YES
8-9 AM	431	95	25	NO	NO	YES	NO
9-10 AM	363	76	27	NO	NO	NO	NO
10-11 AM	367	102	23	NO	NO	YES	NO
11-12 AM	371	92	17	NO	NO	YES	NO
12-1 PM	363	112	17	NO	NO	YES	NO
1-2 PM	430	122	25	YES	NO	YES	NO
2-3 PM	508	226	33	YES	NO	YES	YES
3-4 PM	518	280	29	YES	NO	YES	YES
4-5 PM	583	378	29	YES	NO	YES	YES
5-6 PM	510	320	22	YES	NO	YES	YES
			Hours that met warrant:	6	1	11	6
				NO	**NO**	**YES***	**NO**

Combination Warrant: **NO**

*This indicates that the volumes meet the requirements set for the Crash Experience Warrant. It does not indicate that the warrant is met. Please see OMUTCD Section 4C.08 for other necessary criteria.

This intersection meets the Peak Hour Warrant and the Four Hour Warrant (See Attached graphs)

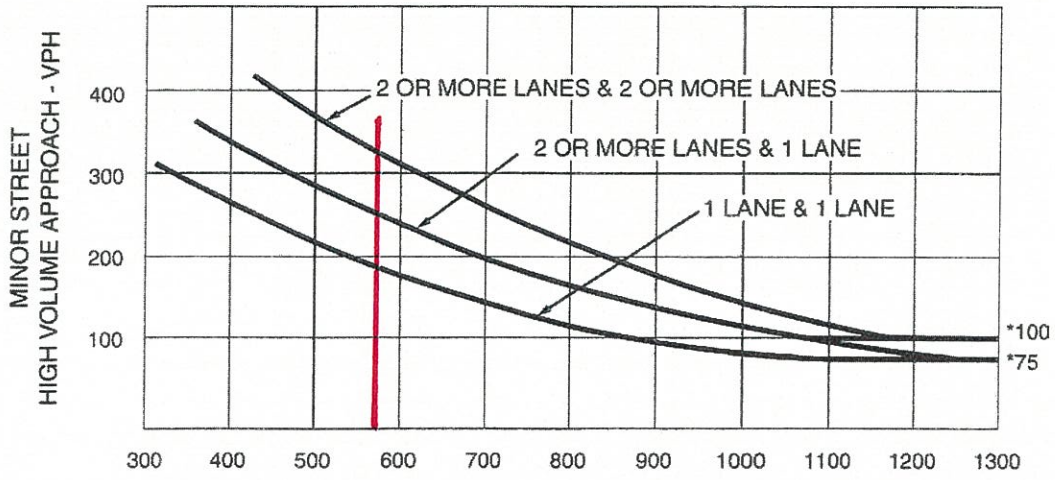
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

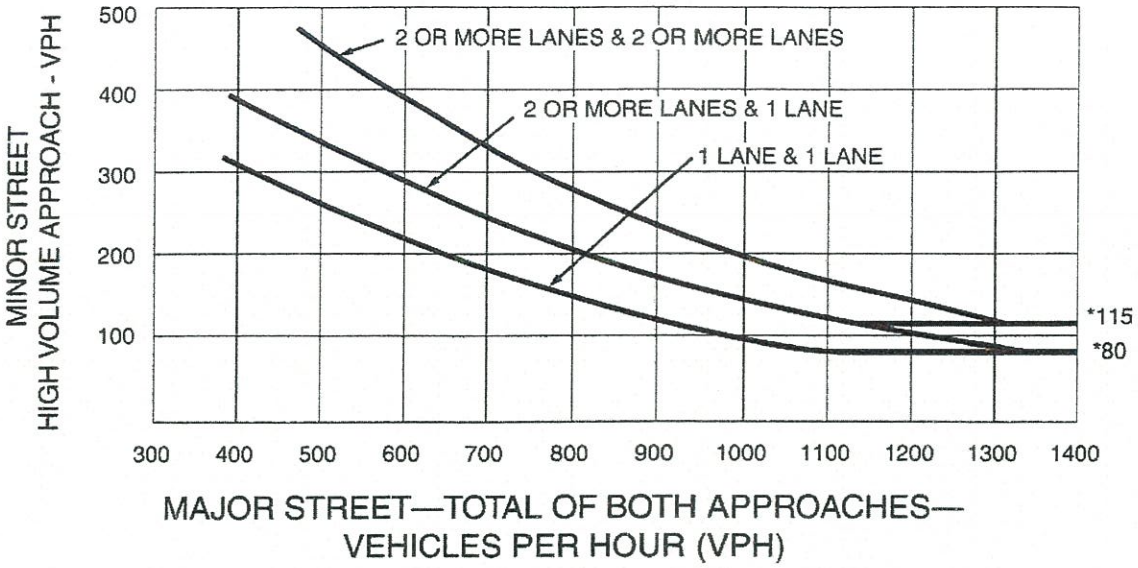
Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40 mph) ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

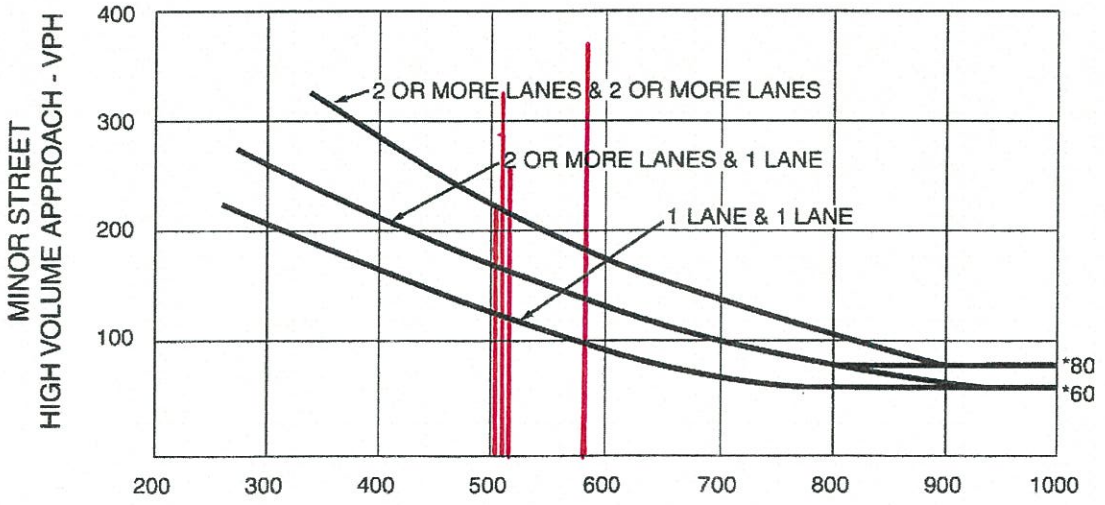
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h (40 mph) ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

Rt 32 & Schuster Rd.

OHIO DEPARTMENT OF TRANSPORTATION

District 9 Planning
650 Eastern Ave., Chillicothe, OH 45601
1-888-819-8501

File Name : AM
Site Code : 00006466
Start Date : 10/26/2004
Page No : 1

Groups Printed- Unshifted - Bank 1

	SchusterRd From North					S.R. 32 From East					SchusterRd From South					S.R. 32 From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:00 AM	3	1	6	0	10	5	52	0	0	57	1	9	1	0	11	0	25	6	0	31	109
06:15 AM	3	1	8	0	12	10	72	0	0	82	1	0	2	0	3	0	35	11	0	46	143
06:30 AM	6	1	17	0	24	12	80	0	1	93	0	7	5	0	12	1	28	22	0	51	180
06:45 AM	6	3	4	0	13	4	71	0	0	75	0	3	3	0	6	1	40	20	0	61	155
Total	18	6	35	0	59	31	275	0	1	307	2	19	11	0	32	2	128	59	0	189	587
07:00 AM	9	3	11	0	23	5	65	0	0	70	1	7	3	0	11	4	38	6	0	48	152
07:15 AM	15	0	14	1	30	9	77	1	0	87	0	9	3	0	12	4	56	32	0	92	221
07:30 AM	58	3	4	0	65	8	84	0	0	92	0	10	2	0	12	2	55	33	0	90	259
07:45 AM	19	4	7	0	30	8	85	1	0	94	1	7	8	0	16	1	49	18	0	68	208
Total	101	10	36	1	148	30	311	2	0	343	2	33	16	0	51	11	198	89	0	298	840
08:00 AM	6	0	4	0	10	2	65	0	0	67	0	3	6	0	9	3	53	10	0	66	152
08:15 AM	3	0	6	0	9	3	53	0	0	56	1	5	0	0	6	1	35	11	0	47	118
08:30 AM	10	2	10	0	22	3	45	0	0	48	1	3	1	0	5	1	40	1	0	42	117
08:45 AM	3	4	4	0	11	0	39	0	0	39	0	2	3	0	5	1	46	6	0	53	108
Total	22	6	24	0	52	8	202	0	0	210	2	13	10	0	25	6	174	28	0	208	495
09:00 AM	3	0	8	2	13	3	36	1	0	40	0	6	0	0	6	0	44	7	0	51	110
09:15 AM	6	3	5	0	14	1	28	1	0	30	0	3	3	0	6	2	44	2	0	48	98
09:30 AM	1	0	3	0	4	1	45	0	0	46	1	7	1	0	9	1	43	2	0	46	105
09:45 AM	4	3	4	0	11	2	41	1	0	44	1	4	1	0	6	1	43	3	0	47	108
Total	14	6	20	2	42	7	150	3	0	160	2	20	5	0	27	4	174	14	0	192	421
10:00 AM	5	2	4	0	11	1	38	1	0	40	0	5	1	0	6	0	27	5	0	32	89
10:15 AM	0	3	11	0	14	1	27	0	0	28	0	3	2	0	5	1	36	4	0	41	88
10:30 AM	3	3	6	0	12	2	44	0	0	46	1	5	0	0	6	3	53	6	0	62	126
10:45 AM	9	1	7	0	17	1	46	0	0	47	1	2	3	0	6	0	55	5	0	60	130
Total	17	9	28	0	54	5	155	1	0	161	2	15	6	0	23	4	171	20	0	195	433
11:00 AM	2	1	5	0	8	0	36	0	0	36	0	3	0	0	3	1	47	4	0	52	99
11:15 AM	6	2	4	0	12	3	44	0	0	47	0	4	1	0	5	1	44	6	0	51	115
11:30 AM	5	1	2	0	8	4	33	1	0	38	0	0	0	0	0	1	50	4	0	55	101
11:45 AM	5	4	1	0	10	2	36	0	0	38	0	8	1	0	9	2	36	5	0	43	100
Total	18	8	12	0	38	9	149	1	0	159	0	15	2	0	17	5	177	19	0	201	415
Grand Total	190	45	155	3	393	90	1242	7	1	1340	10	115	50	0	175	32	1022	229	0	1283	3191
Apprch %	48.3	11.5	39.4	0.8		6.7	92.7	0.5	0.1		5.7	65.7	28.6	0.0		2.5	79.7	17.8	0.0		
Total %	6.0	1.4	4.9	0.1	12.3	2.8	38.9	0.2	0.0	42.0	0.3	3.6	1.6	0.0	5.5	1.0	32.0	7.2	0.0	40.2	

Rte 32 & Schuster Rd.

OHIO DEPARTMENT OF TRANSPORTATION

District 9 Planning
650 Eastern Ave., Chillicothe, OH 45601
1-888-819-8501

File Name : PM
Site Code : 00006466
Start Date : 10/27/2004
Page No : 1

Groups Printed- Unshifted - Bank 1

	Schuster Rd From North					S.R. 32 From East					Schuster Rd From South					S.R. 32 From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
12:00 PM	7	4	6	0	17	1	43	0	0	44	0	2	2	0	4	1	51	4	0	56	121
12:15 PM	3	2	4	0	9	1	39	1	0	41	0	3	0	0	3	6	41	5	0	52	105
12:30 PM	4	6	6	0	16	3	39	1	0	43	0	3	3	0	6	2	23	2	0	27	92
12:45 PM	3	3	5	0	11	2	33	0	0	35	0	2	2	0	4	4	26	4	0	34	84
Total	17	15	21	0	53	7	154	2	0	163	0	10	7	0	17	13	141	15	0	169	402
01:00 PM	4	3	8	0	15	4	40	0	0	44	3	1	3	0	7	4	39	7	0	50	116
01:15 PM	2	3	5	0	10	2	35	0	0	37	0	4	1	0	5	3	45	5	0	53	105
01:30 PM	2	1	8	0	11	3	51	2	0	56	0	4	2	0	6	3	43	13	0	59	132
01:45 PM	6	4	7	0	17	8	51	0	0	59	0	4	3	0	7	1	41	17	0	59	142
Total	14	11	28	0	53	17	177	2	0	196	3	13	9	0	25	11	168	42	0	221	495
02:00 PM	22	3	16	0	41	3	49	1	0	53	1	2	6	0	9	5	39	9	0	53	156
02:15 PM	10	1	16	0	27	2	60	0	0	62	0	4	3	0	7	4	64	2	0	70	166
02:30 PM	12	3	17	0	32	5	56	1	0	62	0	6	3	0	9	4	71	5	0	80	183
02:45 PM	8	5	20	0	33	2	54	1	0	57	1	4	3	0	8	3	44	9	0	56	154
Total	52	12	69	0	133	12	219	3	0	234	2	16	15	0	33	16	218	25	0	259	659
03:00 PM	11	9	24	0	44	2	36	0	0	38	0	2	2	0	4	6	49	9	0	64	150
03:15 PM	8	5	32	0	45	2	52	3	0	57	1	6	1	0	8	2	56	3	0	61	171
03:30 PM	11	4	22	0	37	2	47	1	0	50	3	5	4	0	12	5	65	13	0	83	182
03:45 PM	3	6	11	0	20	2	61	1	0	64	0	4	1	0	5	3	71	12	0	86	175
Total	33	24	89	0	146	8	196	5	0	209	4	17	8	0	29	16	241	37	0	294	678
04:00 PM	6	14	28	0	48	2	50	1	0	53	0	2	2	0	4	2	93	6	0	101	206
04:15 PM	9	13	39	0	61	3	45	0	0	48	2	7	2	0	11	0	81	6	0	87	207
04:30 PM	17	5	37	0	59	1	51	0	0	52	0	3	3	0	6	2	73	7	0	82	199
04:45 PM	5	6	32	0	43	1	39	0	0	40	0	7	1	0	8	4	94	5	0	103	194
Total	37	38	136	0	211	7	185	1	0	193	2	19	8	0	29	8	341	24	0	373	806
05:00 PM	4	3	34	0	41	2	52	2	0	56	2	5	1	0	8	4	61	9	0	74	179
05:15 PM	6	9	28	0	43	2	52	0	0	54	0	2	1	0	3	4	66	7	0	77	177
05:30 PM	26	3	33	0	62	1	53	0	1	55	0	3	3	0	6	7	53	3	0	63	186
05:45 PM	6	4	18	0	28	0	65	0	0	65	1	3	1	0	5	6	45	0	0	51	149
Total	42	19	113	0	174	5	222	2	1	230	3	13	6	0	22	21	225	19	0	265	691
Grand Total	195	119	456	0	770	56	1153	15	1	1225	14	88	53	0	155	85	1334	162	0	1581	3731
Apprch %	25.3	15.5	59.2	0.0		4.6	94.1	1.2	0.1		9.0	56.8	34.2	0.0		5.4	84.4	10.2	0.0		
Total %	5.2	3.2	12.2	0.0	20.6	1.5	30.9	0.4	0.0	32.8	0.4	2.4	1.4	0.0	4.2	2.3	35.8	4.3	0.0	42.4	

PIK 32 & 220

OHIO DEPARTMENT OF TRANSPORTATION

District 9 Planning
650 Eastern Ave., Chillicothe, OH 45601
1-888-819-8501

Add to north leg of Schuster Rd

File Name : PIK-32~1
Site Code : 00005566
Start Date : 09/15/2004
Page No : 2

Groups Printed- Unshifted - Bank 1

	S.R. 220 From North					S.R. 32 From East					Germany Rd From South					S.R. 32 From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
01:00 PM	0	4	12	0	16	12	49	0	0	61	0	4	3	0	7	4	41	0	0	45	129
01:15 PM	0	6	14	0	20	27	44	1	0	72	0	6	9	0	15	7	55	0	0	62	169
01:30 PM	0	5	7	0	12	13	48	2	0	63	0	8	4	0	12	8	56	1	0	65	152
01:45 PM	0	6	15	0	21	14	53	1	0	68	0	5	7	0	12	9	38	1	0	48	149
Total	0	21	48	0	69	66	194	4	0	264	0	23	23	0	46	28	190	2	0	220	599
02:00 PM	0	7	19	0	26	29	62	0	0	91	1	11	6	0	18	10	57	0	0	67	202
02:15 PM	1	8	15	0	24	22	57	0	0	79	1	5	8	0	14	8	60	0	0	68	185
02:30 PM	1	5	16	0	22	26	41	1	0	68	0	6	5	0	11	11	69	0	0	80	181
02:45 PM	1	8	15	0	24	19	41	0	0	60	0	4	0	0	4	7	69	0	0	76	164
Total	3	28	65	0	96	96	201	1	0	298	2	26	19	0	47	36	255	0	0	291	732
03:00 PM	0	7	18	0	25	18	55	1	0	74	0	7	6	0	13	12	71	0	0	83	195
03:15 PM	0	14	32	0	46	15	58	0	0	73	0	4	1	0	5	13	94	0	0	107	231
03:30 PM	0	9	18	0	27	22	57	0	0	79	0	5	5	0	10	9	93	0	0	102	218
03:45 PM	0	9	27	0	36	21	71	0	0	92	2	6	3	0	11	12	75	1	0	88	227
Total	0	39	95	0	134	76	241	1	0	318	2	22	15	0	39	46	333	1	0	380	871
04:00 PM	0	6	22	0	28	19	52	0	0	71	0	9	3	0	12	19	106	0	0	125	236
04:15 PM	1	16	46	0	63	19	42	0	0	61	1	6	2	0	9	16	98	0	0	114	247
04:30 PM	0	15	29	0	44	16	40	2	1	59	0	9	3	0	12	16	107	0	0	123	238
04:45 PM	0	16	17	0	33	22	49	0	0	71	1	10	1	0	12	11	90	0	0	101	217
Total	1	53	114	0	168	76	183	2	1	262	2	34	9	0	45	62	401	0	0	463	938
05:00 PM	0	16	29	0	45	20	40	1	0	61	2	6	6	0	14	14	81	0	0	95	215
05:15 PM	1	10	22	0	33	17	35	1	0	53	0	2	5	0	7	11	80	0	0	91	184
05:30 PM	1	12	27	0	40	24	47	2	0	73	2	3	3	0	8	9	78	0	0	87	208
05:45 PM	1	9	21	0	31	19	55	0	0	74	0	3	1	0	4	7	55	0	0	62	171
Total	3	47	99	0	149	80	177	4	0	261	4	14	15	0	33	41	294	0	0	335	778
Grand Total	15	269	675	0	959	1041	2371	23	1	3436	22	333	230	0	585	318	2663	10	1	2992	7972
Apprch %	1.6	28.1	70.4	0.0		30.3	69.0	0.7	0.0		3.8	56.9	39.3	0.0		10.6	89.0	0.3	0.0		
Total %	0.2	3.4	8.5	0.0	12.0	13.1	29.7	0.3	0.0	43.1	0.3	4.2	2.9	0.0	7.3	4.0	33.4	0.1	0.0	37.5	

PIK 32 & 220

OHIO DEPARTMENT OF TRANSPORTATION

District 9 Planning
650 Eastern Ave., Chillicothe, OH 45601
1-888-819-8501

Add to north leg of Schuster Rd.

File Name : PIK-32~1
Site Code : 00005566
Start Date : 09/15/2004
Page No : 1

Groups Printed- Unshifted - Bank 1

	S.R. 220 From North					S.R. 32 From East					Germany Rd From South					S.R. 32 From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
06:00 AM	0	0	2	0	2	33	48	0	0	81	0	12	8	0	20	1	26	0	0	27	130
06:15 AM	0	2	11	0	13	42	76	0	0	118	0	20	6	0	26	3	39	0	0	42	199
06:30 AM	0	0	6	0	6	78	81	0	0	159	0	27	7	0	34	0	36	1	0	37	236
06:45 AM	1	3	8	0	12	37	70	0	0	107	0	9	5	0	14	3	36	0	0	39	172
Total	1	5	27	0	33	190	275	0	0	465	0	68	26	0	94	7	137	1	0	145	737
07:00 AM	0	5	10	0	15	24	72	1	0	97	0	9	13	0	22	5	43	0	0	48	182
07:15 AM	0	3	13	0	16	31	53	0	0	84	0	8	12	0	20	5	55	0	0	60	180
07:30 AM	0	2	17	0	19	36	89	0	0	125	0	11	9	0	20	3	33	0	0	36	200
07:45 AM	0	2	13	0	15	30	72	0	0	102	0	4	10	0	14	3	44	0	0	47	178
Total	0	12	53	0	65	121	286	1	0	408	0	32	44	0	76	16	175	0	0	191	740
08:00 AM	1	5	6	0	12	31	67	0	0	98	0	5	4	0	9	5	55	1	0	61	180
08:15 AM	0	4	4	0	8	23	47	0	0	70	0	8	3	0	11	2	43	0	0	45	134
08:30 AM	0	4	5	0	9	21	43	1	0	65	0	12	7	0	19	6	39	0	0	45	138
08:45 AM	1	6	9	0	16	24	44	1	0	69	2	9	6	0	17	0	32	0	0	32	134
Total	2	19	24	0	45	99	201	2	0	302	2	34	20	0	56	13	169	1	0	183	586
09:00 AM	0	2	6	0	8	16	36	1	0	53	0	2	4	0	6	7	47	0	0	54	121
09:15 AM	0	3	6	0	9	14	37	0	0	51	2	8	4	0	14	4	42	0	0	46	120
09:30 AM	0	1	11	0	12	13	39	0	0	52	1	2	3	0	6	2	42	0	0	44	114
09:45 AM	0	1	4	0	5	16	50	0	0	66	0	3	3	0	6	3	32	0	1	36	113
Total	0	7	27	0	34	59	162	1	0	222	3	15	14	0	32	16	163	0	1	180	468
10:00 AM	0	3	9	0	12	21	38	1	0	60	1	3	3	0	7	1	41	0	0	42	121
10:15 AM	0	2	16	0	18	15	30	0	0	45	0	6	4	0	10	6	52	2	0	60	133
10:30 AM	1	2	7	0	10	18	31	0	0	49	0	9	3	0	12	5	36	0	0	41	112
10:45 AM	1	1	8	0	10	13	35	2	0	50	1	6	1	0	8	3	50	0	0	53	121
Total	2	8	40	0	50	67	134	3	0	204	2	24	11	0	37	15	179	2	0	196	487
11:00 AM	0	5	9	0	14	8	40	1	0	49	1	2	3	0	6	1	56	1	0	58	127
11:15 AM	1	4	11	0	16	10	39	0	0	49	0	6	4	0	10	8	38	0	0	46	121
11:30 AM	1	3	9	0	13	11	40	0	0	51	2	9	3	0	14	6	38	0	0	44	122
11:45 AM	1	2	11	0	14	14	48	0	0	62	0	5	4	0	9	2	44	1	0	47	132
Total	3	14	40	0	57	43	167	1	0	211	3	22	14	0	39	17	176	2	0	195	502
12:00 PM	0	6	14	0	20	21	36	0	0	57	0	4	4	0	8	2	54	1	0	57	142
12:15 PM	0	3	8	0	11	13	33	2	0	48	0	3	4	0	7	7	40	0	0	47	113
12:30 PM	0	2	13	0	15	15	41	1	0	57	1	5	6	0	12	4	50	0	0	54	138
12:45 PM	0	5	8	0	13	19	40	0	0	59	1	7	6	0	14	8	47	0	0	55	141
Total	0	16	43	0	59	68	150	3	0	221	2	19	20	0	41	21	191	1	0	213	534

SIGNAL WARRANT DATA SHEET

Pik 32 & 220 / Germany Rd

Study By: R Chaffin Date: 09/20/04 Date of Counts: 09/15/04

Condition A - Minimum Vehicular Volume

Vehicles per hour on **MAJOR** street (total of both approaches)		Vehicles per hour on higher-volume **MINOR**-street approach (one direction only)	
	Combination / Crash Experience		Combination / Crash Experience
70% 420	56% 336	70% 105	56% 84

Condition B - Interruption of Continuous Traffic

Vehicles per hour on **MAJOR** street (total of both approaches)		Vehicles per hour on higher-volume **MINOR**-street approach (one direction only)	
	Combination / Crash Experience		Combination / Crash Experience
70% 630	56% 504	70% 53	56% 42

Comments:

For this analysis, the number of lanes used for moving traffic on each approach for the Major street was 2 or more.

The number of lanes used for moving traffic on each approach for the Minor street was 1.

The volume requirements were reduced 70% since the speed limit on the Major street exceeds 40 mph OR this location is within an isolated community with a population of less than 10,000.

HOUR	MAJOR STREET S.R. 32 Volume	MINOR APPROACH S.R. 220 Volume	MINOR APPROACH Germany Rd Volume	Condition A	Condition B	Condition A Crash Experience	Condition B Crash Experience
6-7 AM	610	33	94	NO	NO	YES	YES
7-8 AM	599	65	76	NO	NO	NO	YES
8-9 AM	485	45	56	NO	NO	NO	NO
9-10 AM	402	34	32	NO	NO	NO	NO
10-11 AM	400	50	37	NO	NO	NO	NO
11-12 AM	406	57	39	NO	NO	NO	NO
12-1 PM	434	59	41	NO	NO	NO	NO
1-2 PM	484	69	46	NO	NO	NO	NO
2-3 PM	589	96	47	NO	NO	YES	YES
3-4 PM	698	134	39	YES	YES	YES	YES
4-5 PM	725	168	45	YES	YES	YES	YES
5-6 PM	596	149	33	YES	NO	YES	YES
			Hours that met warrant:	3	2	5	6
				NO	**NO**	**NO**	**NO**
			Combination Warrant:			**NO**	

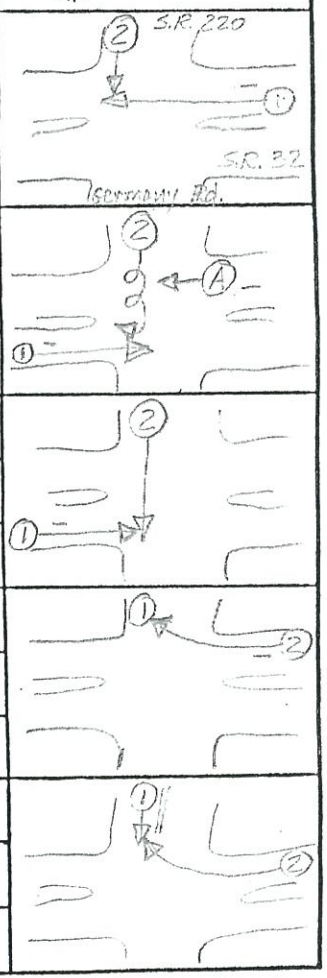
*This indicates that the volumes meet the requirements set for the Crash Experience Warrant. It does not indicate that the warrant is met. Please see OMUTCD Section 4C.08 for other necessary criteria.

TRAFFIC ACCIDENT ANALYSIS

Division No. 09 | Time Period: From 1-1-02 to 12-31-02 | Report No.

Location S.R. 32 & 220 | County Pike | Page No. 1 of 3

LOCATION OF ACCIDENT								TYPE & DAY	VEH.	DRIVERS					COLLISION DIAGRAM
DATE OF ACCIDENT	TIME	LIGHT	K.	INJ.	PD-$	WEATHER	ROAD COND.				DIR.	SPEED	COND.	VIOLATIONS	INDICATE NORTH
REMARKS															
028043612 2-11-02	P 2:45	D	0	0		Clear	Dry	Angle	99 Jeep	1	W	SUV 59	N	None	
? Left the scene								Mon	?	2	S		?	Failure To Yield	
										3					
028152544 3-8-02	P 2:40	D	0	2		Cloudy	Dry	Angle	67 Ford	1	E	PU 60	N	None	
#2, 23, M, Oak Hill, OH								Fri	96 Ford	2	S	C 25	N	Failure To Control	
										3					
028068352 3-15-02	P 3:45	D	0	0		Rain	Wet	Angle	92 Ford	1	E	Van 60	N	None	
#2, 25, M, Portsmouth, OH								Fri	84 Ford	2	S	P.U. 15	N	Failure To Yield	
										3					
028144232 4-14-02	P 3:15	D	0	0		Rain	Wet	Angle	95 Dodg	1	S	C 0	N	None	
#2, 17, F, Piketon, OH								Sun	91 Ford	2	W	C 35	N	Failure To Control	
										3					
028112993 4-19-02	P 8:45	N	0	1		Rain	Wet	Head On	90 Ford	1	S	P.U. 0	N	None	
#2, 46, M, Chillicothe, OH								Fri	90 Dodg	2	W	P.U. 35	DUI	Left of Center	
										3					



LEGEND

DIRECTIONAL ANALYSIS

- Motor vehicle movement before accident
- Vehicle movement after accident
- Pedestrian movement
- Skidding vehicle
- Vehicle overturning out of control
- Sideswipe
- Head-on collision
- Rear-end collision
- Vehicle struck fixed object
- Parked vehicle

CONDITION OF DRIVER

- N – Normal
- D – Drinking
- I – Intoxicated
- A – Asleep or Fatigued
- PD – Physical defect

Form TS-AR-12 Ohio Department of Highways-Bureau of Traffic

TRAFFIC ACCIDENT ANALYSIS

Division No. 09 | Time Period: From 1-1-02 to 12-31-02 | Report No.

Location S.R. 32 & 220 | County Pike | Page No. 2 of 3

LOCATION OF ACCIDENT								TYPE & DAY	VEH.	DRIVERS					COLLISION DIAGRAM
DATE OF ACCIDENT	TIME	LIGHT	K.	INJ.	PD-$	WEATHER	ROAD COND.				DIR.	SPEED	COND.	VIOLATIONS	INDICATE NORTH
REMARKS															
028129851	P							90	1		C				S.R. 220
5-14-02	5:00	D	0	2		Cloudy	Dry	Angle	Pont	1	E	55	N	None	
#2, 67, F, Minford, OH								Tue	98 Ford	2	N	C 35	N	Failure To Yield	② S.R. 32 ① Germany Rd.
										3					
028189519	A							90	1		W	C			② ①
6-29-02	8:12	D	0	1		Fog	Dry	Angle	Ford	1	W	57	N	None	
#2, 30, M, Chillicothe, OH								Sat	OD Ford	2	S	P.U. 20	N	Failure To Yield	
										3					
028205359	P							OD	1		N	Van			
7-15-02	2:50	D	0	0		Clear	Dry	Angle	Plym	1	N	5	N	Failure To Yield	
#1, 33, F, Beaver, OH								Mon	86 Buic	2	E	C 40	N	None	② ①
										3					
028265308	P							99	1		E	Van			②
9-25-02	3:30	D	0	2		Cloudy	Dry	Angle	Chry	1	E	60	N	None	
#2, 17, F, Beaver, OH								Wed	93 Chev	2	S	C 5	N	Failure To Yield	①
										3					
028265309	P							98	1		W	Van			② ①
9-25-02	4:12	D	0	0		Clear	Dry	Angle	Ford	1	W	45	N	None	
#2, 28, F, Beaver, OH								Wed	95 Pont	2	S	Van 5	N	Failure To Yield	
										3					

LEGEND

DIRECTIONAL ANALYSIS

- Motor vehicle movement before accident
- Vehicle movement after accident
- Pedestrian movement
- Skidding vehicle
- Vehicle overturning out of control
- Sideswipe
- Head-on collision
- Rear-end collision
- Vehicle struck fixed object
- Parked vehicle

CONDITION OF DRIVER

- N – Normal
- D – Drinking
- I – Intoxicated
- A – Asleep or Fatigued
- PD – Physical defect

Form TS-AR-12 Ohio Department of Highways-Bureau of Traffic

TRAFFIC ACCIDENT ANALYSIS

Division No. 09 | Time Period: From 1-1-02 to 12-31-02 | Report No. _____

Location S.R. 32 & 220 | County Pike | Page No. 3 of 3

LOCATION OF ACCIDENT								TYPE & DAY	VEH.	DRIVERS					COLLISION DIAGRAM
DATE OF ACCIDENT	TIME	LIGHT	K.	INJ.	PD-$	WEATHER	ROAD COND.				DIR.	SPEED	COND.	VIOLATIONS	INDICATE NORTH
REMARKS															
028303546 11-8-02	P 4:05	D	0	1		Clear	Dry	Angle	98 Jeep	1	E	SUV 60	N	None	2 S.R. 220; 1 S.R. 32; Germany Rd.
#2, 58, F, Beaver, OH								Fri	86 Linc	2	S	C 15	N	Failure To Yield	
										3					
										1					
										2					
										3					
										1					
										2					
										3					
										1					
										2					
										3					
										1					
										2					
										3					

LEGEND

DIRECTIONAL ANALYSIS

- Motor vehicle movement before accident
- Vehicle movement after accident
- Pedestrian movement
- Skidding vehicle
- Vehicle overturning out of control
- Sideswipe
- Head-on collision
- Rear-end collision
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- Parked vehicle

CONDITION OF DRIVER

- N – Normal
- D – Drinking
- I – Intoxicated
- A – Asleep or Fatigued
- PD – Physical defect

Form TS-AR-12 Ohio Department of Highways-Bureau of Traffic

TRAFFIC ACCIDENT ANALYSIS

Division No. 09 | Time Period: From 1-1-03 to 12-31-03 | Report No. _____

Location S.R. 32 & 220 | County Pike | Page No. 1 of 2

LOCATION OF ACCIDENT								TYPE & DAY	VEH.	DRIVERS					COLLISION DIAGRAM
DATE OF ACCIDENT	TIME	LIGHT	K.	INJ.	PD.-$	WEATHER	ROAD COND.				DIR.	SPEED	COND.	VIOLATIONS	INDICATE NORTH
REMARKS															
038015340 1-17-03	P 3:40	D	0	0		Cloudy	Dry	Angle	00 Ford	1	W	C 53	N	None	S.R. 220 / S.R. 32 / Germany Rd.
#2, 20, M, Piketon, OH								Fri	92 Plym	2	N	C 10	N	Failure To Yield	
										3					
038076276 3-4-03	P 2:10	D	0	0		Clear	Dry	Angle	84 Ford	1	W	C 55	N	None	
#2, 79, M, Piketon, OH								Tue	02 Toyo	2	N	C 30	N	Failure To Yield	
										3					
038137530 4-18-03	P 4:25	D	0	0		Cloudy	Dry	Angle	87 Chev	1	N	Van 5	N	Failure To Yield	
#1, 34, M, West Chester, OH								Fri	96 Niss	2	W	P.U. 65	N	None	
										3					
038148537 5-18-03	P 3:40	D	0	3		Cloudy	Dry	Angle	93 Olds	1	W	C 60	N	None	
#2, 45, M, Batavia, OH								Sun	99 Toyo	2	S	Van 10	N	Failure To Yield	
										3					
038199066 7-9-03	P 2:05	D	0	2		Clear	Dry	Angle	89 Dodg	1	S	C 25	N	Failure To Yield	
#1, 39, F, Lucasville, OH								Wed	91 Merc	2	W	C 60	N	None	
										3					

LEGEND

DIRECTIONAL ANALYSIS

- Motor vehicle movement before accident
- Vehicle movement after accident
- Pedestrian movement
- Skidding vehicle
- Vehicle overturning out of control
- Sideswipe
- Head-on collision
- Rear-end collision
- Vehicle struck fixed object
- Parked vehicle

CONDITION OF DRIVER

- N – Normal
- D – Drinking
- I – Intoxicated
- A – Asleep or Fatigued
- PD – Physical defect

Form TS-AR-12 Ohio Department of Highways-Bureau of Traffic

TRAFFIC ACCIDENT ANALYSIS

Division No. 09 | Time Period: From 1-1-03 to 12-31-03 | Report No. _____

Location S.R. 32 & 220 | County Pike | Page No. 2 of 2

LOCATION OF ACCIDENT								TYPE B DAY	VEH.	DRIVERS					COLLISION DIAGRAM
DATE OF ACCIDENT	TIME	LIGHT	K.	INJ.	PD-$	WEATHER	ROAD COND.				DIR.	SPEED	COND.	VIOLATIONS	INDICATE NORTH
REMARKS															
038311087	P	D	0	2		Rain	Wet	Angle	97 Dodg	1	N	Vans 10	N	Failure To Yield	S.R. 220
11-6-03	4:45														
#1, 31, F, Waverly, OH								Thu	96 Pont	2	E	C 60	N	None	2 → S.R. 32 → 1 Germany Rd.
										3					
038352740	A	N	0	0		Clear	Dry	Rear End	94 Ford	1	W	P.U. 20	N	None	1 ← 2
12-4-03	5:25														
#2, 58, M, Middletown, OH								Thu	01 Chev	2	W	Truck 55	N	Following Too Close	
										3					
										1					
										2					
										3					
										1					
										2					
										3					
										1					
										2					
										3					

LEGEND

DIRECTIONAL ANALYSIS

- Motor vehicle movement before accident
- Vehicle movement after accident
- Pedestrian movement
- Skidding vehicle
- Vehicle overturning out of control
- Sideswipe
- Head-on collision
- Rear-end collision
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CONDITION OF DRIVER

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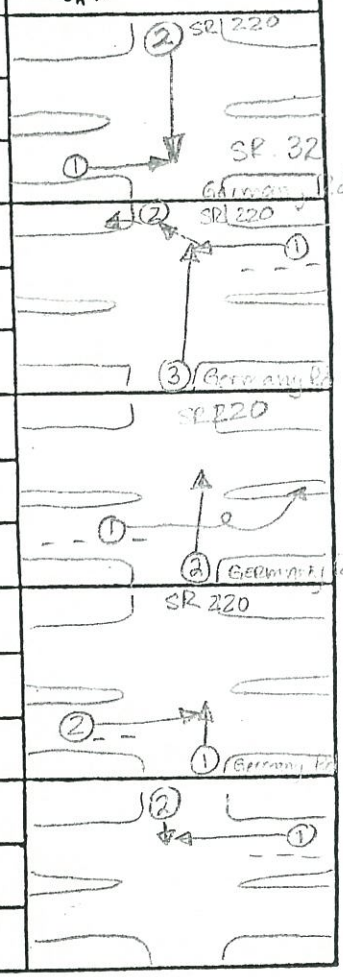
Form TS-AR-12 Ohio Department of Highways-Bureau of Traffic

TRAFFIC ACCIDENT ANALYSIS

Division No. 09 | Time Period: From 1-1-04 to 12-31-04 | Report No. _____

Location SR 32 & 220 | County PIKE | Page No. 1 OF 1

LOCATION OF ACCIDENT								TYPE B DAY	VEH.	DRIVERS					COLLISION DIAGRAM
DATE OF ACCIDENT	TIME	LIGHT	K.	INJ.	PD-$	WEATHER	ROAD COND.				DIR.	SPEED	COND.	VIOLATIONS	
REMARKS															
048030879 2-3-04	P 4:05	D	0	2		CLOUDY	DRY	ANGLE	83 CHEV	1	E	C 56	N	NONE	
#2, 75, M, LUCASVILLE, OH								TUE	02 DODG	2	S	VAN 0	N	FAILURE TO YIELD	
										3					
048061864 3-14-04	P 12:25	D	0	1		CLOUDY	DRY	ANGLE	87 FORD	1	W	P.V. 55	N	SEAT BELT	
#3, 16, M, DARBYVILLE, OH								SUN	74 CHEV PASS		N	C 20	N	FAILURE TO YIELD	
									98 CHEV PASS	2	S	C 0	N	NONE	
048076410 3-30-04	P 5:55	D	0	0		RAIN	WET	NON-COLLISION	00 Ford	1	E	C 50	N	NONE	
								TUE	89 FORD	2	N	C 15	N	NONE	
										3					
047093346 4-8-04	P 6:25	D	0	1		CLEAR	DRY	ANGLE	91 DODG	1	N	C 59	N	NONE	
#1, 27, M, WAVERLY, OH								THU	03 CHEV	2	E	C 10	N	FAILURE TO YIELD	
										3					
044023348 4-13-04	P 1:41	D	1	2		CLEAR	DRY	ANGLE	02 CHEV	1	W	SUV 60	N	NONE	
#2, 51, M, ASHLAND, OH								SUN	88 CHEV	2	S	C 0	?	FAILURE TO YIELD	
										3					



LEGEND

DIRECTIONAL ANALYSIS

- Motor vehicle movement before accident
- Vehicle movement after accident
- Pedestrian movement
- Skidding vehicle
- Vehicle overturning out of control
- Sideswipe
- Head-on collision
- Rear-end collision
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CONDITION OF DRIVER

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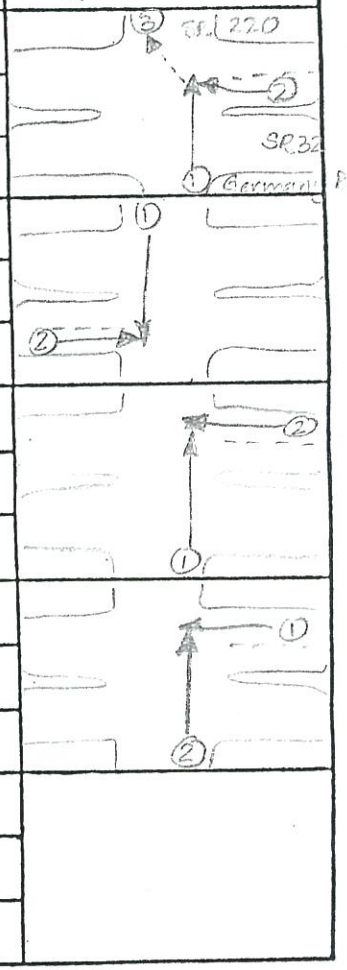
Form TS-AR-12 Ohio Department of Highways-Bureau of Traffic

TRAFFIC ACCIDENT ANALYSIS

Division No. 09 | Time Period: From 1-1-04 to 12-31-04 | Report No. _____

Location SR. 32 & 220 | County PIKE | Page No. 2 of 2

LOCATION OF ACCIDENT								TYPE & DAY	VEH.	DRIVERS					COLLISION DIAGRAM
DATE OF ACCIDENT	TIME	LIGHT	K.	INJ.	PD-$	WEATHER	ROAD COND.				DIR.	SPEED	COND.	VIOLATIONS	INDICATE NORTH
REMARKS															
048289742 10-17-04	P 12:30	D	0	7		CLEAR	DRY	ANGLE	96 PLYM	2	W	VAN 56	N	NONE	
#1, 80, M, WAVERLY, OH								SUN	90 CHEV	1	N	C 15	N	FAILURE TO YIELD	
									94 MERC	3	S	C 0	N	NONE	
048288848 12-2-04	A 6:00	N	0	6		CLEAR	DRY	ANGLE	00 HYUN	2	E	C 55	N	NONE	
#1, 74, M, PIKETON, OH								THU	00 CHEV	1	S	20	N	FAILURE TO YIELD	
										3					
048386011 12-26-04	A 9:40	D	0	3		CLOUDY	DRY	ANGLE	92 PONT	2	W	VAN 55	N	NONE	
#1, 26, M, MINFORD, OH								SUN	96 DODG	1	N	VAN 15	N	FAILURE TO YIELD	
										3					
048386679 12-29-04	P 2:40	D	0	2		CLOUDY	DRY	ANGLE	93 CHEV	1	W	PU 57	N	NONE	
#2, 43, F, CHILLICOTHE, OH								WED	00 CHEV	2	N	BUS 10	N	FAILURE TO YIELD	
										3					
										1					
										2					
										3					



LEGEND

DIRECTIONAL ANALYSIS

- Motor vehicle movement before accident
- Vehicle movement after accident
- Pedestrian movement
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Form TS-AR-12 Ohio Department of Highways-Bureau of Traffic

DISTRICT 9 SAFETY REVIEW TEAM MEETING

Monday, October 24, 2005
9:30 a.m.

Attendees:
David Norris, Deputy Director Assistant Engineer
Todd Long, Planning Administrator
Vaughn Wilson, Highway Management Administrator
Tom Barnitz, Production Administrator
Greg Baird, Traffic Studies Engineer
Richard Chaffin, Traffic Management Analyst (DSRT Chairperson)
Patricia Wetzel, Transportation Engineer
Jessica Mullins, E.I.T.
Tom Corbin, Real Estate Administrator
Tom Day, City Engineer (City of Chillicothe)

AGENDA:
Ross County, State Route 159, log point 0.00 to 0.96 "hot spot"
Ross County, State Route 159, log point 1.06 to 3.33 "hot spot"
Ross County, U.S. Route 35, log point 18.00 to 20.00 "hot spot"
Lawrence County, State Route 7, log point 7.99 to 8.49
Pike County, Intersection of State Route 32 & 220 / Germany Road - See Page 3

Ross County, State Route 159, log point 0.00 to 0.96 "hot spot"
The accident statistics were looked at for this location. It was pointed out that there is one year of data (2002) where the traffic control for the Bridge Street bridge closure was still in effect. The work zones for the bridge construction made major changes in the traffic patterns in this section. There was discussion that the two areas where most of the accidents occurred were near the Stewart Road intersection and the Water Street intersection. There was some discussion about adding lanes on Stewart Road. The team decided that this intersection was recently reconstructed and we would not pursue any changes to the intersection at this time. It was pointed out that we already have a safety project approved for the intersection of S.R. 159 and Water Street and this is where most of the accidents occurred within this location. The team decided to pursue completion of this project and no other improvements will be recommended at this time.

Ross County, State Route 159, log point 1.06 to 3.33 "hot spot"
Ross County, U.S. Route 35, log point 18.00 to 20.00 "hot spot"
These two locations were looked at together because they intersect at an interchange and the problem area that the team wishes to address effects both locations. It was pointed out that both these "hot spot" locations were just studied earlier this year and the recommended project was to relocate North Plaza Blvd. to align it directly across from the existing intersection of the U.S. 35 westbound off ramp. The objective of this project

is to eliminate the existing traffic signal at North Plaza Blvd. The major problem is that we have three signalized intersections within a total distance of approximately 450 feet which is much too close to effectively provide proper signal timing and coordination. The elimination of the middle traffic signal will improve the traffic flow which will alleviate congestion and accidents on State Route 159. This will also alleviate the traffic back ups onto U.S. Route 35 where we are experiencing eastbound rear end accidents. This was discussed with Jennifer Townley in Central Office Safety to see what she would require in the form of a study to submit the project for safety funding. She said she will require a formal study of the North Plaza intersection and the U.S. 35 westbound off ramp intersection. This formal study was completed and presented to the DSRT for review at this meeting. During the review of the study there were other ideas discussed to alleviate the accidents. The other options discussed were to relocate the U.S. 35 westbound off ramp intersection to the North Plaza intersection or to relocate the North Plaza intersection to the Marietta Road intersection. Tom Day did not believe the City and the business owners would be in agreement with the option to relocate North Plaza to Marietta Road. It was pointed out the option of relocating the U.S. 35 westbound off ramp to North Plaza makes the intersection and traffic signal to close to Marietta Road. It was determined that the intersection spacing and the traffic flow would be better with the original recommendation to move North Plaza to the U.S. 35 off ramp. However, it was pointed out that the project cost would probably be considerably less with the relocation of North Plaza to Marietta Road instead of moving it to the U.S. 35 off ramp and that Central Office Safety may only be acceptable to the least costly option. Tom again expressed concern that the City and the business owners would not be acceptable to that option. It was determined that this intersection is inside the City of Chillicothe and we could not do the project if the City is not in agreement. The team decided to have Tom discuss this project with the City Council and the Mayor and advise us which way to proceed with this project. It was determined by the team that there would need to be a considerable amount of design work to be completed before we can get a reasonable cost estimate for right of way and construction for this project. The team decided that when we agree on a project we will need to request safety funds for the design work. The team discussed a low cost / short term project to address the rear end accidents on U.S. Route 35. It was decided to look into some type of warning sign that would have warning flashers on U.S. 35 that can be activated when traffic backs up to the top of the eastbound off ramp from S.R. 159. This could be accomplished by vehicle detector loops placed in the pavement and connected to the warning flashers.

Lawrence County, State Route 7, log point 7.99 to 8.49

This location is one that shows on our Safety Program every year and all low cost corrective work has been implemented. The team looked at this location last year and recommended no further improvements at this time because the long term / high cost project for this location is currently under construction and will be completed in 2006. The project is construction of Phase 1B of the Chesapeake bypass which will remove most of the traffic from this section. The team looked at the 2005 updated study for this work plan year and again recommends no further action for this location.

Pike County, Intersection of State Route 32 & 220 / Germany Road

This location is being looked at as an ongoing safety study from last year. This location is ranked 261 in the new 2004 HSP listing. It was ranked 183 in the 2003 HSP listing. The latest proposal being looked at for this meeting was proposed by the Pike County Engineer as a compromise to the existing intersection being restricted to a right in / right out only configuration. The Pike County Engineer was not in agreement with our proposal to make the intersection a right in / right out. The newest proposal is to re-route the Germany Road side of the intersection 800 feet west of the existing Germany Road intersection and make the existing State Route 220 side of the intersection a right in / right out intersection. This is in conjunction with upgrading a local county road to ODOT standards and re-routing State Route 220 across the upgraded county road. It was determined that the new proposal to relocate Germany Road would be costly because of the right of way costs. In addition, we may lose a considerable amount of money in a law suit with the property owner that recently constructed a new convenient store / gas station on Germany Road at the intersection. The team discussed leaving the Germany Road side of the intersection where it exists with continued access to State Route 32 and making the State Route 220 side of the intersection a cul-de-sac with no connection to State Route 32. This would eliminate the through movement from Germany Road to State Route 220. In addition, an acceleration lane would be constructed in the median for the motorists turning left out of Germany Road. It was determined that this option would eliminate most of the accidents and there would be no right of way costs. After considerable discussion the team decided to go ahead with this as the recommended project. This is in conjunction with upgrading Schuster Road to ODOT standards and re-routing State Route 220 across it. Also, a traffic signal will be installed at the new intersection of State Route 32 and 220.

RDC

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DISTRICT 9 SAFETY REVIEW TEAM MEETING

Tuesday, April 12, 2005
1:00 P.M.

Attendees:
Harry Fry, District Deputy Director
Vaughn Wilson, Highway Management Administrator
Todd Long, Planning & Programs Administrator
David Norris, Deputy Director Assistant Engineer
Greg Baird, Traffic Studies Engineer
Richard Chaffin, Traffic Management Analyst (DSRT Chairperson)
Patricia Wetzel, Transportation Engineer
Tom Ramsay, Central Office Safety Representative
Tom Day, City Engineer (City of Chillicothe)

AGENDA:
Review and discuss highway safety studies for the following locations:
Ross County, Intersection of State Route 159 & Water Street
Pike County, Intersection of State Route 32 & 220 / Germany Road - See Page 2

Ross County, Intersection of State Route 159 & Water Street
This location is ranked 183 in the 2003 Highway Safety Program. This location was studied a few months ago and it was determined we wanted to get some cost estimates to construct left turn lanes on Bridge Street at the intersection. We contracted with our task order consultant to do some preliminary design and prepare cost estimates to construct left turn lanes on State Route 159 (Bridge Street). The team reviewed the accident data from the first meeting. One third of all the accidents that occurred at the intersection were left turn accidents on Bridge Street. The team decided we need to go ahead with the recommendation to construct left turn lanes on Bridge Street at this intersection. This is the only intersection on Bridge Street that does not have left turn lanes except for the next intersection away which is Second Street. Second Street has a left turn lane in one direction but not in the other direction. The team discussed that the widening required to get left turn lanes installed for the Water Street intersection would taper all the way back to the Second Street intersection so it would make sense to increase the widening enough to get a left turn lane for Second Street. There is already 4 to 5 feet of additional pavement in this area so the widening would be minimal. During the review of the preliminary plans it was noticed that the consultant plans show right of way will have to be purchased for all of their proposals. However, it appears there may be a possibility the turn lanes could be constructed on existing right of way. The team decided to go back to the consultant and have them look at installing the left turn lanes on existing right of way. Another area of discussion for the project was concerning access management. It was determined during the study we are not having an accident problem with the accesses but it would be a good time to address access management. The team decided to let the City determine if they want to implement access management since the project is completely within city limits. It will add cost to the project if access management is implemented. It was decided we need to get this issue resolved and we need to get a letter of

commitment from the City for their funding participation in the project. The City Engineer will meet with the City Council and the Mayor to get approval for the funds and also determine if they want to implement access management. Dave Norris will get back with the consultant and have them look into the possibility of constructing the turn lanes on existing right of way. Once these issues are resolved the team will request safety funds to construct left turn lanes at this intersection.

Pike County, Intersection of State Route 32 & State Route 220 / Germany Road

This location is ranked No. 183 in the 2003 Highway Safety Program. The team studied this location a few months ago and it was determined this intersection needs to be relocated or eliminated because we have experienced angle accidents every since the intersection was constructed about ten years ago. The intersection continually appears on our safety program. There are sight distance problems at the intersection because of the railroad overpass just east of the intersection. However the intersection does meet minimum design standards. It was determined in the previous meeting that we will re-route State Route 220 across an existing county road (Schuster Road) and we will either make the existing intersection a right in / right out or we will construct an overpass across State Route 32 and completely eliminate the connection. In order to make the final determination we contracted with our task order consultant to do some preliminary design and prepare cost estimates so we could determine the feasibility of implementing these countermeasures. The cost estimate to upgrade the county road to state route standards and construct the overpass across State Route 32 exceeds 5 million dollars. There are considerable right of way costs associated with the structure over State Route 32 and its connecting roadway. The team decided not to construct the overpass because the cost would lessen the probability of the project getting approved for funding. Instead, the intersection movements will be restricted to only allow right turns in and right turns out. This will reduce the total number of conflict points from 36 to 4. This will considerably improve the safety of the intersection. The team decided to look at the condition of Darst Road because it will likely become the roadway that local traffic will use if they need to turn left onto State Route 32. We will need to decide whether or not to upgrade Darst Road as part of the project. In addition, the team decided to meet with the Pike County Engineer to advise him of our recommendations and to get his thoughts or concerns about the project. Richard will arrange a meeting between ODOT and the Pike County Engineer. Harry Fry, Todd Long, and Richard Chaffin will be present for ODOT at the meeting.

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DISTRICT 9 SAFETY REVIEW TEAM MEETING

Monday, December 6, 2004
9:30 A.M.

Attendees:
Harry Fry, District Deputy Director
Vaughn Wilson, Highway Management Administrator
Todd Long, Planning & Programs Administrator
David Norris, Production Administrator
Greg Baird, Traffic Studies Engineer
Richard Chaffin, Traffic Management Analyst (DSRT Chairperson)
Patricia Wetzel, Transportation Engineer
Steve Jenkins, Pike County Transportation Administrator

AGENDA:
Review and discuss the highway safety study for the following location:

Pike County, Intersection of State Route 32 & State Route 220 / Germany Road
This location is ranked No. 183 in the 2003 Highway Safety Program. The team discussed the information that was requested from the last meeting. We wanted to get a new traffic count at the intersection of State Route 32 & Schuster Road and look to see if a traffic signal warrant would be met. Also, we wanted to talk to Jennifer Townley to see if it would be possible to get safety funding to upgrade Schuster Road and reroute State Route 220 across it. Richard updated the team on these two issues: Jennifer advised that she would be open to funding the upgrade of Schuster Road and rerouting of State Route 220 if we eliminated the existing State Route 220/Germany Road intersection with State Route 32. Also the traffic counts at State Route 32 and Schuster Road show that a traffic signal would be warranted if we reroute State Route 220 across Schuster Road.

The team further discussed the rerouting scheme and many other possible countermeasures from constructing a traffic signal to constructing a full interchange. There was considerable discussion about erecting a traffic signal at the existing State Route 32 & 220/Germany Road intersection. It was decided that this would not be a good location for a traffic signal because of the sight restriction problem caused by the bridge over the railroad just east of the intersection.

The team decided to go forward with the low cost countermeasure recommended from the first meeting which was to put back plates around the flasher signal heads and to construct warning signs with flashers in the west bound lanes of State Route 32 in advance of the intersection. In addition to the low cost countermeasure the team decided to look further into three other long term countermeasures which are listed below:

1) Reroute State Route 220 across Schuster Road to access State Route 32 and upgrade the roadway & pavement of Schuster Road. Construct a traffic signal at the new intersection. Eliminate the existing intersection and construct an overpass over State Route 32 to get the State Route 220/Germany Road traffic across State Route 32.

2) Reroute State Route 220 across Schuster Road to access State Route 32 and upgrade the roadway & pavement of Schuster Road. Construct a traffic signal at the new intersection. Close the median at the existing intersection and allow only right turns onto the side roads from State Route 32 and right turns out of the side roads onto State Route 32.
3) Reroute State Route 220 across Schuster Road to access State Route 32 and upgrade the roadway & pavement of Schuster Road. Construct a traffic signal at the new intersection. Completely eliminate the existing connection of State Route 220 from State Route 32 and leave the existing connection of Germany Road with full turning movements. Construct an acceleration lane in the median for left turns out of Germany Road. (If the existing Germany Road access is removed, ODOT will be likely to pay out considerable compensation to a new under construction gas station / convenient store business located on the Germany Road corner of the intersection).

The team decided we need to get preliminary designs and reasonably accurate cost estimates on all three scenarios before we make our final recommendation. It was decided for us to get with Jennifer Townley and see if we could utilize the Central Office task order to obtain a consultant to review our HSP study with our recommended countermeasures and propose other countermeasures if appropriate. Additionally, we need the consultant to do enough preliminary design to give us reasonably accurate cost estimates for our recommended countermeasures and any other countermeasures they propose.

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DISTRICT 9 SAFETY REVIEW TEAM MEETING

Monday, October 7, 2004
9:30 A.M.

Attendees:
Harry Fry, District Deputy Director
Vaughn Wilson, Highway Management Administrator
Todd Long, Planning & Programs Administrator
David Norris, Production Administrator
Greg Baird, Traffic Studies Engineer
Richard Chaffin, Traffic Management Analyst (DSRT Chairperson)
Patricia Wetzel, Transportation Engineer
Steve Jenkins, Pike County Transportation Administrator

AGENDA:
Review and discuss the highway safety study for the following location:

Pike County, Intersection of State Route 32 & State Route 220 / Germany Road
This location is ranked No. 183 in the 2003 Highway Safety Program. The study information was discussed and it was pointed out that this intersection was previously studied in 2000. The improvements made as a result of that study were installing an overhead flasher at the intersection and delineating the median pavement of the intersection with dotted white lines. The accident data for the current study shows a problem with angle accidents. Most of the angle accidents involved motorists on westbound 32 colliding with vehicles crossing the intersection from the side roads. The conclusion is that there are problems with visibility for motorists at the intersection looking toward the east because of the vertical crest in the pavement on the bridge over the railroad. Also there was discussion about the visibility of seeing the vehicles because there is no landscape behind the approaching vehicles. The vehicles are elevated by the overpass and the sky is in the background of the approaching vehicles. The sight distances meet minimum design requirements but the sight issues are contributing to the accidents. In addition to the sight distance issues there is another factor contributing to the accident problem. There are high speeds on State Route 32 approaching the intersection. The 85 percentile speeds of the vehicles approaching the intersection are 63 mph and 65 mph.

There were several possible countermeasures discussed by the team. The team basically brain stormed and came up with numerous possibilities from installing warning signs to constructing an interchange. The following are some of the ideas that were discussed:
- Install a stop & go traffic control signal
- Install warning signs with flashers in advance of the intersection for westbound State Route 32
- Install back plates around the flasher signal heads
- Install an additional flasher head for westbound State Route 32
- Place colored pavement in the median area of the intersection
- Reroute State Route 32 across Shuster Road and disconnect the existing State Route 220 intersection from State Route 32
- Close the median and allow only right turns in and right turns out of the intersection
- Construct an overpass over State Route 32 for State Route 220 and Germany Road to cross over State Route 32 and eliminate the accesses
- Construct a full interchange.

There was considerable discussion concerning the idea of installing a traffic control signal. The traffic warrant study shows a warrant is not met. However, the intersection only needs about 20 additional vehicles per hour for two more hours a day to meet one of the signal warrants. Also, there was considerable discussion about possible safety concerns with installing a traffic signal at this intersection. The concern is the potential increase of rear end accidents on the westbound approach of State Route 32. It was determined that Prepare To Stop signs with flashers could alleviate this concern. There was considerable discussion about rerouting State Route 220 across Shuster Road and eliminating the existing intersection. It was decided that this would require a public meeting and there would be considerable opposition to closing the median of the intersection or disconnecting existing State Route 220 from State Route 32. Also, this would be an expensive fix because Shuster Road would have to be upgraded to ODOT standards and there is a business that would probably have to be removed. There was discussion about constructing an interchange. It was determined that this would be extremely costly and hard to get funding for. The railroad that is situated close to the intersection would add significantly to the cost of an interchange.

The team decided to go forward with installing intersection warning signs with flashers on the westbound approach of State Route 32 in advance of the intersection and install back plates on the flasher signal heads. It was also decided to further investigate the idea of rerouting State Route 220 across Shuster Road. We will perform a traffic count at the intersection of State Route 32 and Shuster Road to see how much traffic is currently using Shuster Road and how the road would be impacted if additional traffic were routed to it. Also, Todd Long will discuss the rerouting scheme with Jennifer Townley in Central Office to see if it would be possible to get safety funding for the rerouting project.

The team will meet again to finalize the recommendation of this study location after the traffic counts are completed and Todd talks to Jennifer about the rerouting scheme.

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