DANVILLE AREA TRANSPORTATION STUDY
Metropolitan Planning Organization

At-Grade Railroad Crossing Study

Danville and Catlin

Vermillion County, Illinois

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1. Introduction

This study was prepared to evaluate eight mainline at-grade crossings along the Norfolk Southern Railway (NS) and CSX Railroad (CSX) through the City of Danville and Village of Catlin, located in Vermillion County, Illinois (see Figure 1.1). The purpose of the evaluation was to identify the highest priority safety improvements among the studied at-grade crossings for submission to the Illinois Department of Transportation (IDOT) Highway Safety Improvement Program (HSIP). The IDOT HSIP has a railway component that targets crossings to reduce the number of fatalities and serious injuries at public highway-railway crossings through the elimination of hazards and/or the installation/upgrade of protective devices at crossings.

Two levels of evaluation were completed in the study to narrow down the initial eight crossings to identify the top priority crossings. The top two recommended crossings from the study have had HSIP applications prepared for their submission to IDOT.

2. Initial Crossing Screening

The initial screening for the eight crossings included collecting the following data for evaluation:

- Existing and Proposed ADT
- Existing and Proposed Daily Train Traffic
- Warning Components at each site
- Vehicular Crashes
- Vehicle-Train Crashes

Calculations completed for each crossing include:

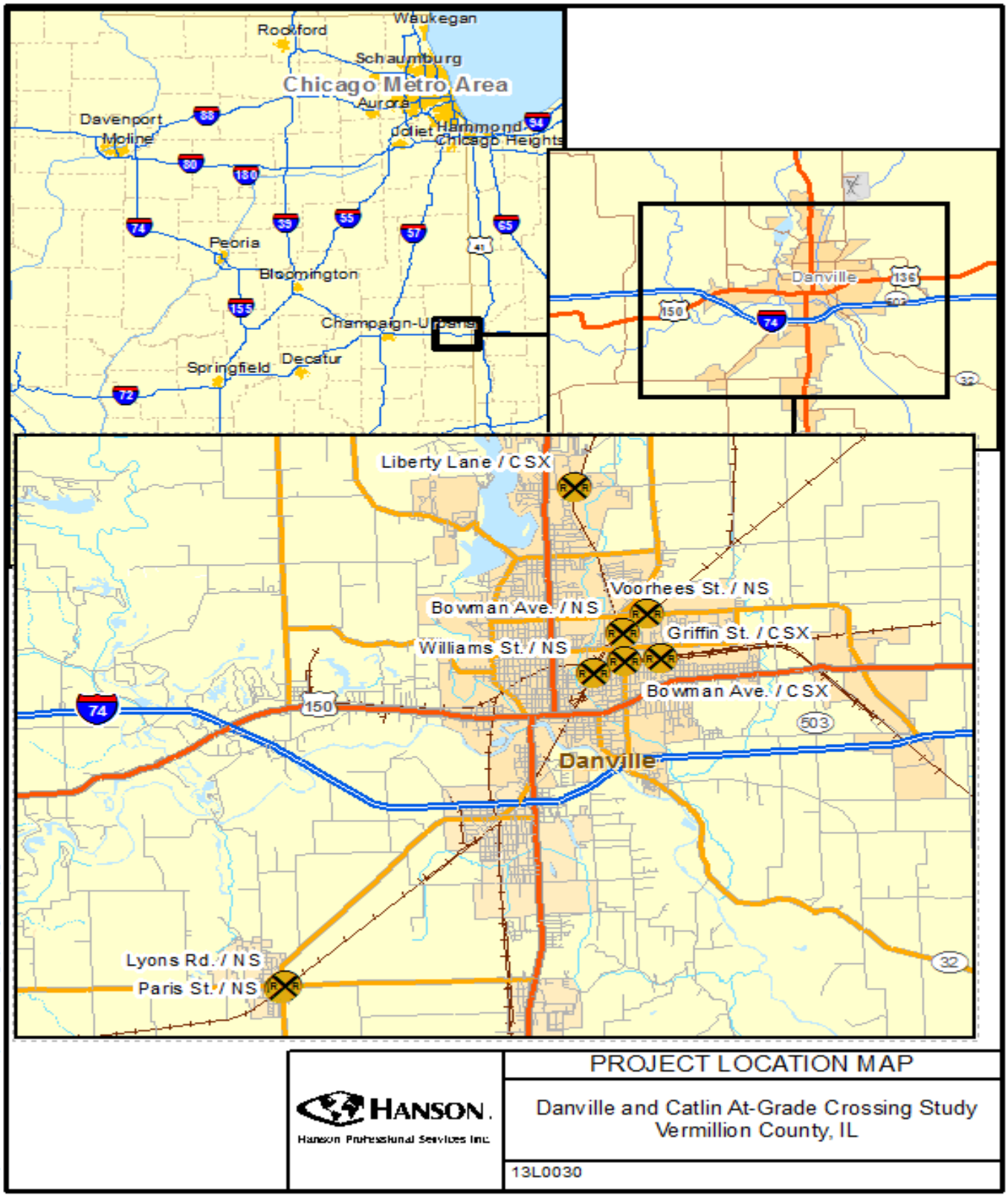
- Expected Crash Frequency
- Delay Time
- 20 Year Exposure Factor

Table 2.1 lists the sources for the data collected and the source of the calculation.

Data	Source
Current ADT	Getting Around Illinois Database
Projected 2035 ADT Values	Danville Area Transportation Study (High Projection Values - 1% annual growth)
Projected 2024, 2034 ADT Values	Interpolated using the growth rate between current and 2035 ADTs (1% annual growth)
Current Train Traffic	ICC Crossing Database. Daily Train traffic for Lyons was reported at 17, but adjacent crossings reported at 47 and to remain consistent through the entire corridor, 47 was used. Daily train traffic for Williams and Voorhees was reported at 22, but all surrounding crossings were reported at 48. To keep the value consistent throughout the corridor, 48 was used because it seemed more logical considering Catlin traffic and a higher frequency of 48 being reported.
Projected Train Crossing	Assumed 1.2% Growth
Warning Components at Crossings	Google Earth/ICC Database
Expected Crash Frequency Procedure	IDOT BLRS Chapter 40 Equation 40-2.1
Historic Crashes	IDOT Safety Mart/ICC Database
Delay Time Procedure	ICC Working Paper 2002-03, Motorist Delay at Public Highway Rail Grade Crossings in Northeastern Illinois
Grade Separation Study Suggested	A report part of the Chicago to St. Louis High-Speed Rail Tier 1 EIS that identified a standard 20-Year Exposure value that would suggest a grade separation study for the relative population.

Table 2.1 Data Collection Sources

Figure 1.1 Project Location/At-Grade Crossings Studied



2.1 Expected Crash Frequency

The crash expectancy was calculated using equation 40-2.1 from the Illinois Department of Transportation (IDOT) Bureau of Local Roads and Streets (BLRS) Manual. The calculated expected crash frequency was compared to the standard of 0.02 crashes per year maximum to determine if current warning devices were sufficient. Table 2.2 shows the data and calculations for the expected crash frequency. Traffic factor and component factor come from table 40-2A in the BLRS Manual.

Table 2.2 Calculated Expected Crash Frequency

Rail Line	Road	City	10 Year ADT	Traffic Factor	Trains Per Day	Signal Component	Component Factor	Expected Crash Frequency Per Year	Years Expected Between Crashes
NS	Voorhees Street	Danville	17680	0.023877	48	Gates, Urban	0.08	0.0917	10.9
NS	Bowman Avenue	Danville	9668	0.012674	48	Gates, Urban	0.08	0.0487	20.5
NS	Williams Street	Danville	6061	0.00772	48	Gates, Urban	0.08	0.0296	33.7
NS	Lyons Road	Catlin	1694	0.002627	47	Gates, Urban	0.08	0.0099	101.2
NS	Paris Street	Catlin	2840	0.003981	47	Gates, Urban	0.08	0.0150	66.8
CSX	Liberty Lane	Danville	6790	0.010278	15	Gates, Urban	0.08	0.0123	81.1
CSX	Bowman Avenue	Danville	10873	0.012674	15	Gates, Urban	0.08	0.0152	65.8
CSX	Griffin Street	Danville	8063	0.010278	15	Flashing Lights, Urban	0.23	0.0355	28.2

2.2 Crash History

The crash history was analyzed from both the IDOT Safety Mart and the ICC railroad crossing database. The numbers are summarized in Table 2.3 below.

Table 2.3 Historical Crash History

			IDOT Safety Mart Data (2007-2011)							ICC Collision History				
Rail Line	Road	City	Total Collisions	K	A	B	C	PD	Calculated Crash Frequency Per Year Based on Data	Total Collisions (1955-2012)	Number of Fatalities	Number of Injuries	Most Recent Collision	Calculated Crash Frequency Per Year Based on Data
NS	Voorhees Street	Danville	9	0	0	2	1	1	2.250	10	1	5	3/15/2004	0.175
NS	Bowman Avenue	Danville	15	0	0	4	4	4	3.750	4	0	5	2/16/2011	0.070
NS	Williams Street	Danville	9	0	1	3	0	0	2.250	11	3	1	2/5/2003	0.193
NS	Lyons Road	Catlin	4	0	0	3	0	0	1.000	2	0	1	1/18/2010	0.035
NS	Paris Street	Catlin	5	0	0	1	1	1	1.250	7	0	5	10/7/1998	0.123
CSX	Liberty Lane	Danville	3	0	2	0	0	0	0.750	5	1	1	4/22/2013	0.088
CSX	Bowman Avenue	Danville	15	0	0	2	3	3	3.750	14	0	3	1/6/2002	0.246
CSX	Griffin Street	Danville	4	0	0	2	0	0	1.000	6	0	1	8/8/2002	0.105

The IDOT Safety Mart Data was collected between 2007 and 2011, excluding crashes that only resulted in property damage because data was only available between 2009 and 2011. ICC Collision History includes all crashes recorded since 1955. The calculated crash frequency per year based on the data provided was included for both the IDOT and ICC Collision data. A comparison of the expected crash frequency per year and historical actual crashes per year shows higher actual rates. The IDOT

data is substantially higher because it includes vehicular crashes in the vicinity of the at-grade crossing not just vehicle train collisions as is reported in the ICC Collision data.

2.2.1 Total Delay Time

The total delay time was calculated using the procedure described in the ICC Working Paper 2002-03, Motorist Delay at Public Highway Rail Grade Crossings in Northeastern Illinois. Table 4 summarizes the calculated delay times.

Table 2.4 Calculated Delay Time

Rail Line	Road	City	2014 Total Daily Delay (Hours)	2034 Total Daily Delay (Hours)
NS	Voorhees Street	Danville	33.94	54.23
NS	Bowman Avenue	Danville	17.19	31.62
NS	Williams Street	Danville	32.75	48.42
NS	Lyons Road	Catlin	2.52	5.75
NS	Paris Street	Catlin	4.42	9.63
CSX	Liberty Lane	Danville	11.18	12.64
CSX	Bowman Avenue	Danville	13.29	25.47
CSX	Griffin Street	Danville	29.20	46.67

2.2.2 Exposure Factor

As part of the preparation of the Chicago to St. Louis High-Speed Rail Tier 1 EIS, an analysis was developed that identified exposure factors for at-grade crossings to warrant grade separation studies within three population categories: over 200,000, 5,000-200,000 and less than 5,000. These categories were based on existing local agency grade separations currently within the State of Illinois. The averages were determined in each category and the resulting value was used as a threshold to determine if a crossing warranted further grade separation studies. Exposure factors are defined as the product of the roadway ADT and the number of trains along the rail line at the crossing. The Exposure level thresholds for grade separation studies are Urban (over 200,000) =1,445,011, Urban (5,000-200,000) = 150,379 and Rural (less than 5,000) = 53,267. Danville is urban (5,000-200,000) and Catlin is rural (less than 5,000).

Table 2.5 Calculated Exposure Factors

Rail Line	Road	City	Trains Per Day (2012)	Trains Per Day (2034)	Existing ADT	Projected 2034 ADT	20 Year Exposure Factor	Grade Separation Study Suggested
NS	Voorhees Street	Danville	48	62	15800	19417	1,211,711	Yes
NS	Bowman Avenue	Danville	48	62	8000	11320	706,412	Yes
NS	Williams Street	Danville	48	62	5600	6368	397,415	Yes
NS	Lyons Road	Catlin	47	61	1200	2102	128,439	Yes
NS	Paris Street	Catlin	47	61	2100	3523	215,282	Yes
CSX	Liberty Lane	Danville	15	20	7400	6435	125,481	No
CSX	Bowman Avenue	Danville	15	20	8800	12969	252,918	Yes
CSX	Griffin Street	Danville	15	20	7100	8730	170,252	Yes

2.2.3 Initial Crossing Screening Recommendation

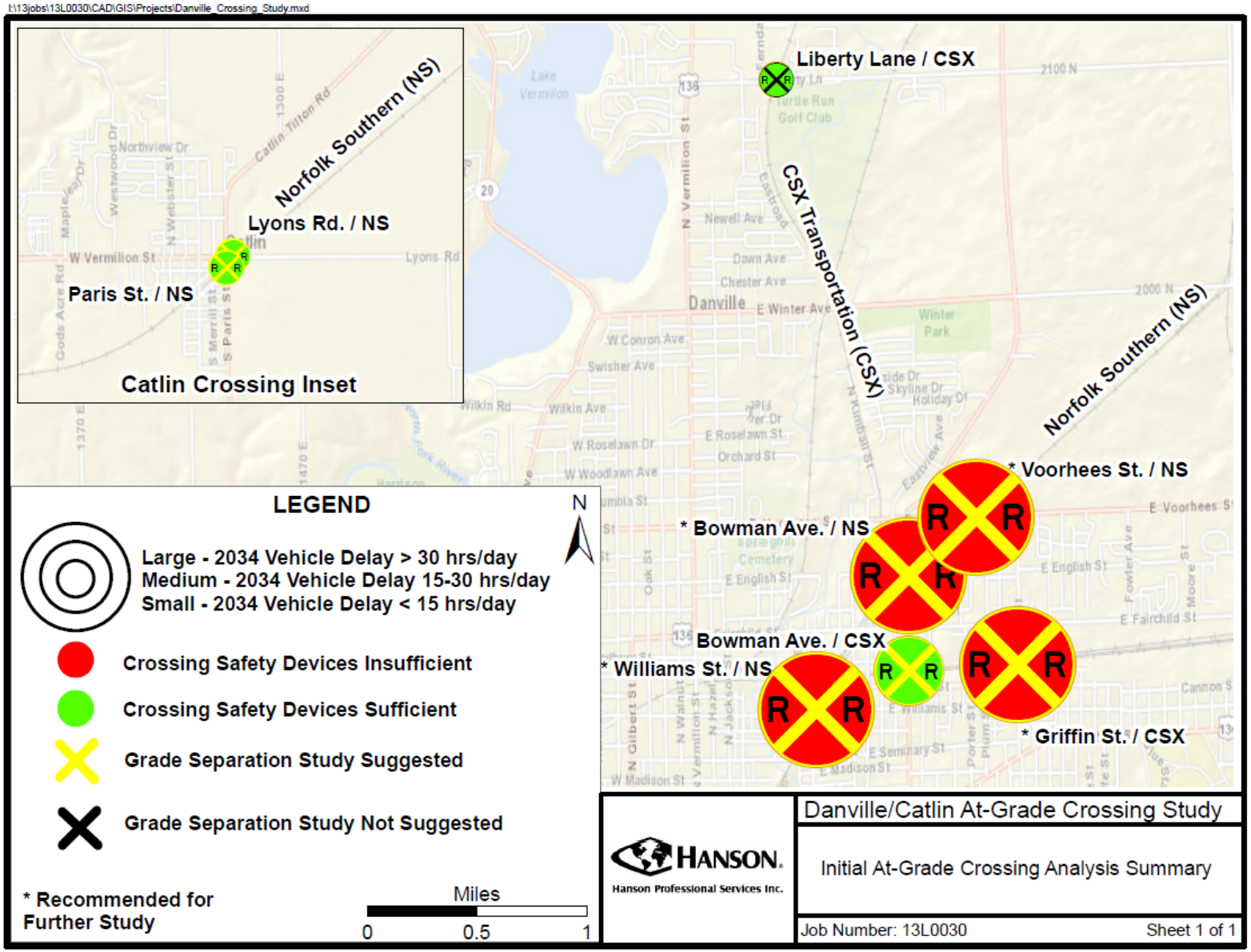
Table 2.6 and Figure 2.1 show the summary results of all analysis completed for the initial screening. Based on the screening results, the following four rail crossings are suggested for additional analysis for safety improvements based on the following reasons:

- Voorhees Street at the NS has insufficient warning devices, the highest exposure factor, highest expected crash frequency and the highest delay.
- Bowman Avenue at the NS has insufficient warning devices, the second highest exposure factor, the second highest expected crash frequency and the highest number of crashes according to IDOT data.
- Williams Street at the NS has insufficient warning devices, the second highest delay and the highest number of fatalities according to ICC Collision Data.
- Griffin Street at the CSX has insufficient warning devices, the third highest delay and the third highest expected crash frequency.

Table 2.6 Initial Crossing Screening Summary

Rail Line	Road	City	20-Year Exposure Factor	2014 Total Daily Delay (Hours)	2034 Total Daily Delay (Hours)	Expected Crash Frequency Per Year	Years Expected Between Crashes	Sufficient/Insufficient Warning Devices (ECF<0.02 to be sufficient)
NS	Voorhees Street	Danville	1211711	33.94	54.23	0.092	10.9	Insufficient
NS	Bowman Avenue	Danville	706412	17.19	31.62	0.049	20.5	Insufficient
NS	Williams Street	Danville	397415	32.75	48.42	0.030	33.7	Insufficient
NS	Lyons Road	Catlin	128439	2.52	5.75	0.010	101.2	Sufficient
NS	Paris Street	Catlin	215282	4.42	9.63	0.015	66.8	Sufficient
CSX	Liberty Lane	Danville	125481	11.18	12.64	0.012	81.1	Sufficient
CSX	Bowman Avenue	Danville	252918	13.29	25.47	0.015	65.8	Sufficient
CSX	Griffin Street	Danville	170252	29.20	46.67	0.035	28.2	Insufficient

Figure 2.1 Initial Crossing Screening Summary



This initial crossing summary was submitted to the Danville Area Transportation Study for review and concurrence of the recommended crossings moving forward. After approval was received, additional crossing analysis was conducted on the four recommended crossings.

3. Additional Crossing Screening

Alternatives carried forward from the initial screening were reviewed for safety improvements that could be implemented to improve the expected crash frequency to the IDOT standard threshold of 0.02. They were also evaluated to determine the benefits and impacts of the improvements considered, the annual cost and benefit cost ratio of the improvements, the financial cost of delays and the benefits and impacts of grade separating the crossing. The annual cost and benefit/cost ratio of the improvements were determined using IDOT BLRS Manual Chapter 40-2.03. Delay calculations for benefit/cost were developed using the initial screening analysis delay hours calculated and the federal travel rate of $20 per hour.

In reviewing the alternatives moving forward, it was noted that all alternatives, except for the Griffin Street / CSX crossing which has only flashing lights, already have the lights and gates configuration for crossing warning device. This is the highest type warning light configuration for the two lane urban streets in which these crossings are located. Also, none of the crossings being evaluated in the additional crossing screening are adjacent to signalized intersections which would provide an opportunity to interconnect and coordinate the traffic signal and train signaling systems.


Griffin/CSX

The rail approach signaling system currently installed at the Voorhees/NS and Bowman/NS crossings is a constant warning time (CWT) system that provides uniform warning times between activation and train arrival, typically located where trains travel at different speeds or switching operations occur. This system is the highest level of activation that would be expected at this type of a crossing. As a result, other non-signalized improvements must be considered to improve the expected crash frequency of these crossings.

The Williams/NS and Griffin/CSX crossings currently have the direct current audio frequency overlay (DC-AFO) approach signaling system. This signaling system uses the track to detect the train with the signals being received at the control unit by either a circuit along the track or by radio frequency. The first improvement consideration at these crossing would be to upgrade the signaling system. Other non-signalized improvements will be reviewed at these crossings as well.

The following non-signaling improvements will be considered at each of the crossing locations:

- Flexible Delineator – This includes the installation of a flexible vertical delineator along the centerline of the roadway used to deter motorists from driving over the centerline and attempting to drive around traffic or gates to illegally cross the tracks when the signaling system has been activated. Based on IDOT BLRS figure 40-1C, a minimum distance of 150 feet will be required on either side of the tracks for the delineator installation. The expected crash reduction factor, or the estimated reduction in crashes at the location, for the flexible

delineator's is expected to be 0.75, which was estimated based on the Federal Railroad Administration (FRA) risk factors for mountable medians with channelization devices.

- Median – This includes the installation of a mountable or raised curb median to help define the traveled way and deter vehicles from attempting to cross over the centerline to drive around the gates. Signs or flexible delineators are often mounted in the median. Typically this installation requires widening to the outside of the roadway to accommodate the median installation. Like the flexible delineators, a 150 foot minimum length from track will be required for the median installation. For these two-lane urban roadways, a minimum median width of 4 feet was assumed. The expected crash reduction factor for the medians is 0.75 for mountable medians with reflective traffic control devices and 0.80 for raised curb medians.

- Grade Separation – This improvement would separate the rail and roadway traffic by way of a bridge structure, eliminating the possibility of train/vehicle collisions. This improvement is the most expensive improvement, but when vehicle delay on highly traveled roadways is considered, may provide a positive cost/benefit ratio. The expected crash reduction factor for grade separations is 1.00, meaning a 100% reduction in rail/train crashes. For this study, a road over rail grade separation was assumed with a touchdown distance of 750 feet each side of the existing tracks.

Four quadrant gates for non-signaling improvements were not considered for these locations as those installations have typically only been included along passenger rail corridors, specifically the High-Speed Rail corridors. The expected crash reduction factor of the four quadrant gate systems is 0.82, only slightly better than the flexible delineator and median measures being evaluated. Also the inclusion of the four quadrant gate systems typically include provisions for automatic vehicle detection for trapped vehicles and signaling systems for the trains along the corridor to detect vehicles within the crossings. The cost of these systems is also substantially higher (typically estimated at $500,000 per location), so the expected cost/benefit at these locations would not be high.

In addition to the benefits and impacts of the safety improvements, a cost benefit and impact analysis was completed for the crossings for the expected delay. As determined in the initial screening analysis, all crossing carried forward had daily vehicle delays of over 30 hours, with some delays approaching 60 hours. While none of the safety improvements will be able to improve delays, except for the CWT upgrade which does provide a delay reduction, the grade separation alternative would eliminate the delays. However the significant costs of installation will be weighed against the delay and safety improvement benefits.

3.1 Voorhees Street / NS

The installation of flexible delineators and mountable medians would not decrease the expected crash frequency to below the 0.20 IDOT threshold, requiring a raised median as a minimum improvement at this location. Table 3.1 summarizes the results for the proposed improvement analysis.

Table 3.1 Voorhees/NS Safety Improvement Analysis Summary

Intersection	Existing Expected Crash Frequency	Proposed Installation	Component Crash Reduction	Proposed Expected Crash Frequency	ECF Savings	ECF Annual Safety Benefit	Initial Cost	Annual Cost	Safey Benefit-Cost Ratio
Voorhees/NS	0.092	Flexible Delineators	0.75	0.023	0.069	$26,073	$16,000	$ 1,280.00	20.4
Voorhees/NS	0.092	Mountable Median	0.75	0.023	0.069	$26,073	$30,000	$ 2,400.00	10.9
Voorhees/NS	0.092	Raised Median	0.80	0.018	0.074	$27,811	$58,000	$ 4,640.00	6.0
Voorhees/NS	0.092	Grade Separation	1.00	0.000	0.092	$34,764	$7,000,000	$300,000.00	0.1

Construction of a raised median would require access changes to the City of Danville Public Works facility as well as a parking lot to the Security Ventures, Inc. building southeast of the crossing (see Figure 3.1). It appears the installation of the raised median and required roadway widening could be completed within existing right-of-way, the existing sidewalk on the north side of the street would not be impacted and no other adjacent cross streets would be affected by the raised median installation. The benefit cost ratio for the installation of the raised median is 6.0, which is much higher than the base benefit cost ratio for improvement of one, which indicates that the public benefit is greater than the public cost.

The calculation for benefit/cost of delay with respect to a grade separation is shown in Table 3.2.

Table 3.2 Voorhees/NS Delay Benefit/Cost Summary

2034 Total Daily Delay Experienced by All Motorists Collectively	2034 Total Delay Experienced by All Motorists Collectively (Hours/Year)	Annual Delay Benefit	ECF Annual Safety Benefit	Total Benefit for Grade Separation	Annual Cost	Delay and Safety Benefit-Cost Ratio
54.23	19794	$395,879	$34,764	$430,643	$300,000	1.4

The construction of a grade separation at this location would impact several properties, require total acquisitions due to loss of public highway access or significant changes in the existing access currently provided for from Voorhees Street (see Figure 3.2). A combination of MSE walls and frontage roads could mitigate the need to acquire full properties, which could be explored during more detailed study. The high volume of traffic along Voorhees does cause significant delays and the benefit of the grade separation would result in a combined delay and safety benefit cost ratio of 1.4, indicating that a grade separation should be a consideration at this location.

Figure 3.1 Voorhees/NS Raised Median

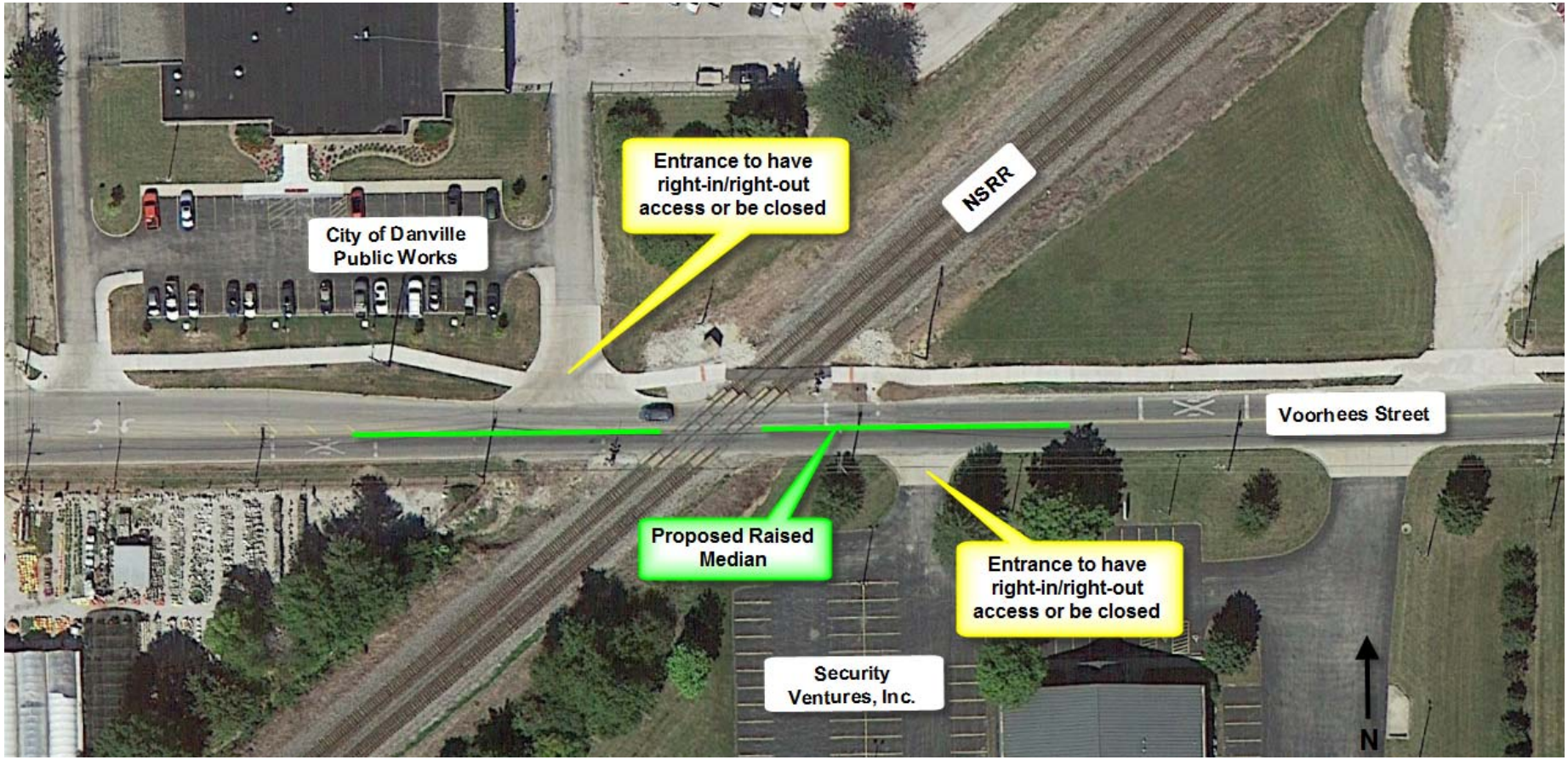
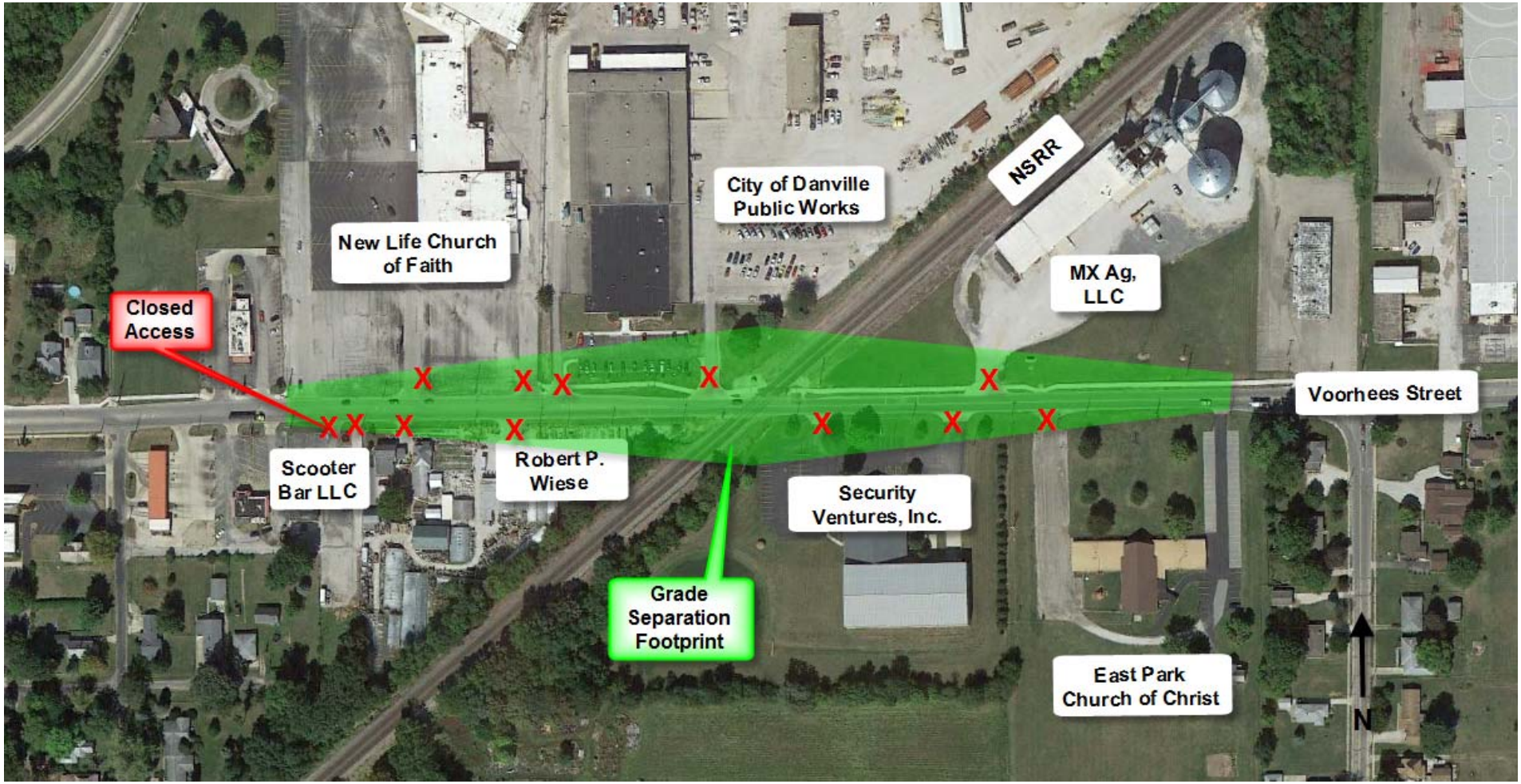


Figure 3.2 Voorhees/NS Grade Separation



3.2 Bowman Avenue / NS

The installation of flexible delineators would decrease the expected crash frequency to below the 0.20 IDOT threshold. Table 3.3 summarizes the results for the proposed improvement analysis.

Table 3.3 Bowman/NS Safety Improvement Analysis Summary

Intersection	Existing Expected Crash Frequency	Proposed Installation	Component Crash Reduction Factor	Proposed Expected Crash Frequency	ECF Savings	ECF Annual Safety Benefit	Initial Cost	Annual Cost	Safey Benefit-Cost Ratio
Bowman/NS	0.049	Flexible Delineators	0.75	0.012	0.037	$13,887	$16,000	$ 1,280.00	10.8
Bowman/NS	0.049	Mountable Median	0.75	0.012	0.037	$13,887	$30,000	$ 2,400.00	5.8
Bowman/NS	0.049	Raised Median	0.80	0.010	0.039	$14,812	$58,000	$ 4,640.00	3.2
Bowman/NS	0.049	Grade Separation	1.00	0.000	0.049	$18,516	$6,000,000	$ 260,000.00	0.07

Construction of flexible delineators at this location would affect the intersecting roadways of English Street and Maples Street, along with two residential and one commercial entrance access (see Figure 3.3). A determination would need to be made whether or not to modify access to right-in/right-out, provide access from another public street, or purchase the property. The benefit cost ratio for the installation of the flexible delineators is 10.8, indicating an extremely high public benefit.

The calculation for benefit/cost of delay with respect to a grade separation is shown in Table 3.4.

Table 3.4 Bowman/NS Delay Benefit/Cost Summary

2034 Total Daily Delay Experienced by All Motorists Collectively (Hours)	2034 Total Delay Experienced by All Motorists Collectively (Hours/Year)	Annual Delay Benefit	ECF Annual Safety Benefit	Total Benefit for Grade Separation	Annual Cost	Delay and Safety Benefit-Cost Ratio
31.62	11541	$230,826	$18,516	$249,342	$260,000	1.0

The construction of a grade separation at this location would impact several residential properties, require total acquisitions due to loss of public highway access or significant changes in the existing access currently provided for from Bowman Avenue (see Figure 3.4). A combination of MSE walls and frontage roads could mitigate the need to acquire full properties, which could be explored during more detailed study. The benefit cost ratio of the proposed grade separation based on the reduction of delay and safety improvements is 1.0, indicating the benefit would equal the expected public cost.

Figure 3.3 Bowman/NS Flexible Delineators

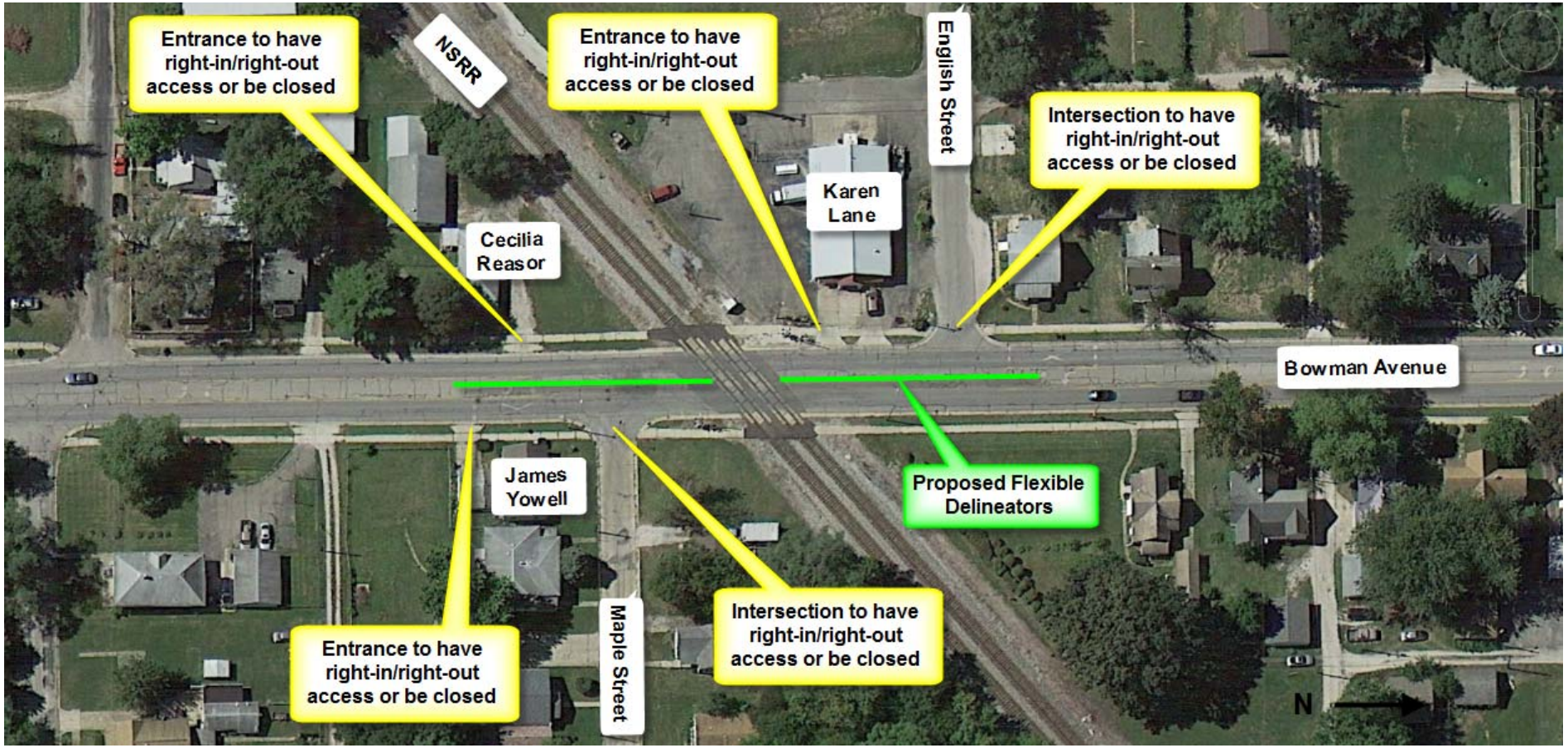
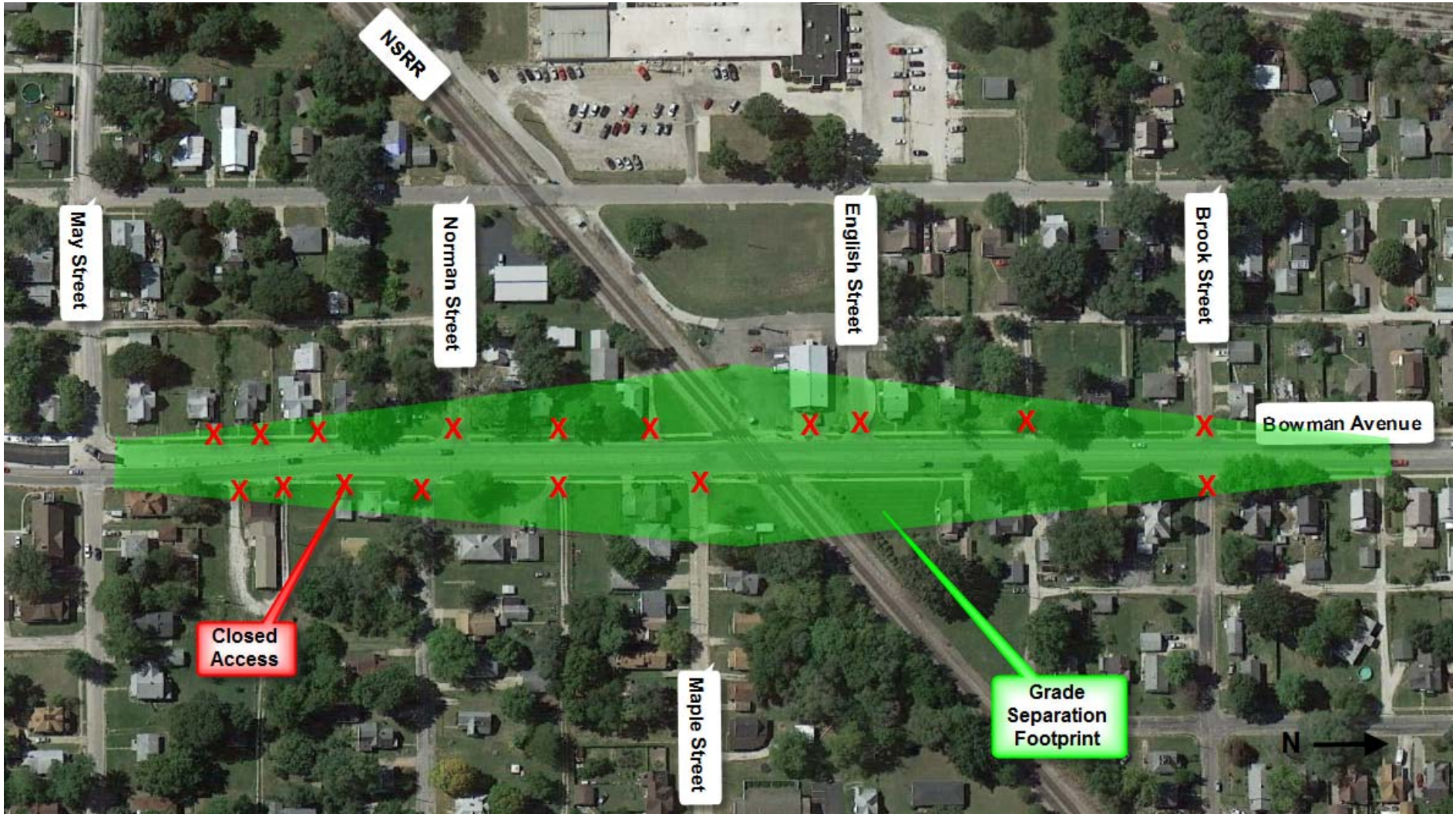


Figure 3.4 Bowman/NS Grade Separation



3.3 Williams Street / NS

The installation of flexible delineators would decrease the expected crash frequency to below the 0.20 IDOT threshold. Table 3.5 summarizes the results for the proposed improvement analysis.

Table 3.5 Williams/NS Safety Improvement Analysis Summary

Intersection	Existing Expected Crash Frequency	Proposed Installation	Component Crash Reduction Factor	Proposed Expected Crash Frequency	ECF Savings	ECF Annual Safety Benefit	Initial Cost	Annual Cost	Safey Benefit-Cost Ratio
Williams/NS	0.030	CWT Upgrade	0.26	0.022	0.008	$2,947	$100,000	$ 8,000.00	0.4
Williams/NS	0.030	Flexible Delineators	0.75	0.008	0.023	$8,502	$16,000	$ 1,280.00	6.6
Williams/NS	0.030	Mountable Median	0.75	0.008	0.023	$8,502	$30,000	$ 2,400.00	3.5
Williams/NS	0.030	Raised Median	0.80	0.006	0.024	$9,069	$58,000	$ 4,640.00	2.0
Williams/NS	0.030	Grade Separation	1.00	0.000	0.030	$11,336	$7,000,000	$300,000.00	0.04

Construction of flexible delineators at this location would affect the intersecting roadways of Junction Street and Short Street, along with three commercial entrances (see Figure 3.5). A determination would need to be made whether or not to modify access to right-in/right-out, provide access from another public street, or purchase the property. The benefit cost ratio for the installation of the flexible delineators is 6.6.

The calculation for benefit/cost of delay with respect to a grade separation is shown in Table 3.6.

Table 3.6 Williams/NS Delay Benefit/Cost Summary

Proposed Installation	2034 Total Daily Delay Experienced by All Motorists Collectively (Hours)	2034 Total Delay Experienced by All Motorists Collectively (Hours/Year)	Annual Delay Benefit	ECF Annual Safety Benefit	Total Benefit for Grade Separation	Annual Cost	Delay and Safety Benefit-Cost Ratio
CWT Upgrade	48.42	17673	$107,413	$2,947	$110,360	$8,000	13.8
Grade Separation	48.42	17673	$353,466	$11,336	$364,802	$300,000	1.2

The construction of a grade separation at this location would impact several commercial and residential properties, impact access to Section Street, Junction Street, Short Street and Anderson Street or require total acquisitions due to loss of public highway access or significant changes in the existing access currently provided for from Williams Street (see Figure 3.6). A combination of MSE walls and frontage roads could mitigate the need to acquire full properties, which could be explored during more detailed study. The benefit cost ratio of the proposed grade separation based on the reduction of delay and safety improvements would be 1.2. Upgrading the circuitry to CWT would provide a 30% delay reduction and the benefit cost ratio of this improvement is 13.8. This 30% reduction is based on the USDOT report on *Benefit-Cost Evaluation of a Highway-Railroad Intermodal Control System (ICS)*.

Figure 3.5 Williams/NS Flexible Delineators

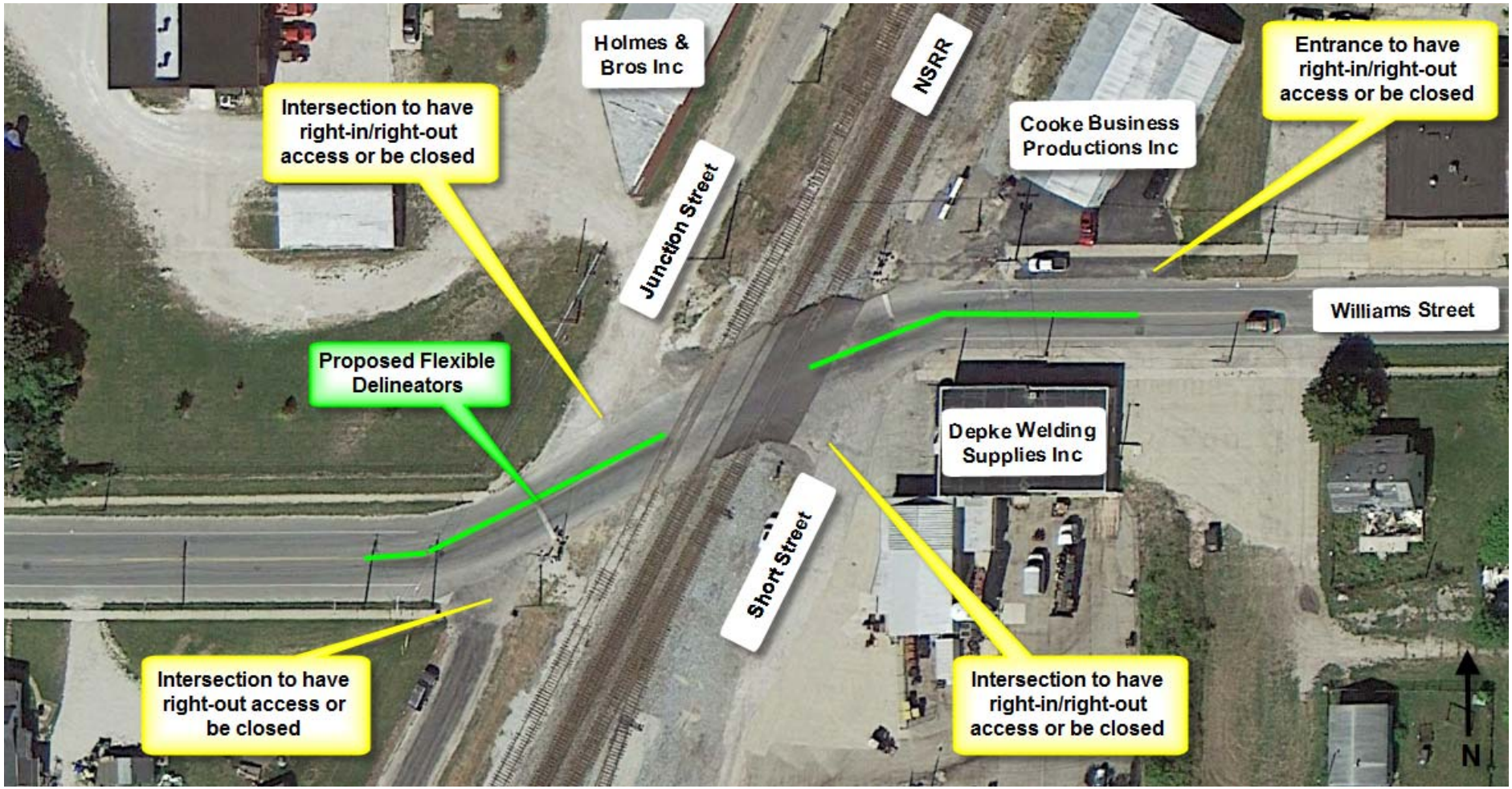
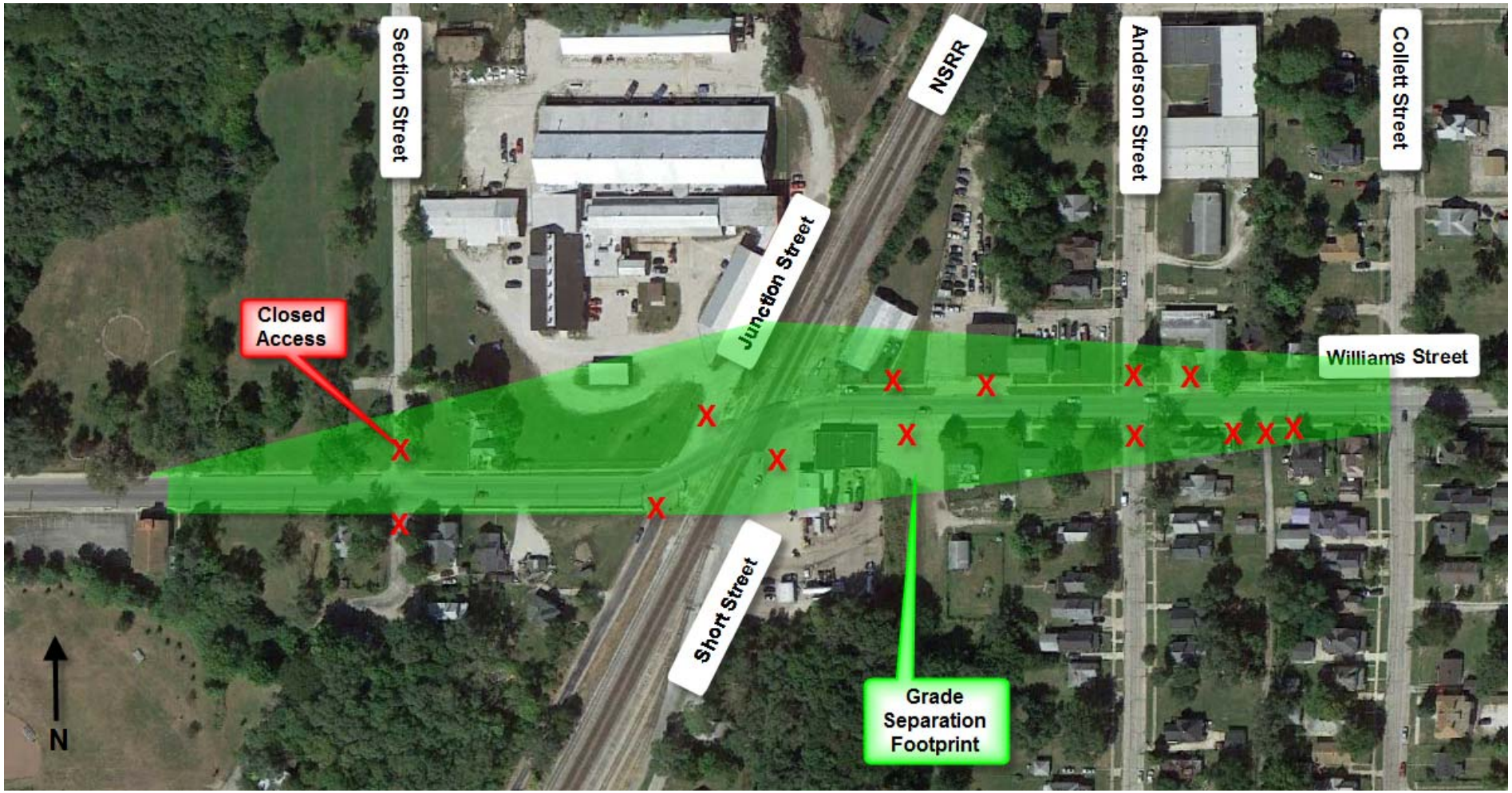


Figure 3.6 Williams/NS Grade Separation



3.4 Griffin Street / CSX

The installation of urban gates would decrease the expected crash frequency to below the 0.20 IDOT threshold. Table 3.7 summarizes the results for the proposed improvement analysis.

Table 3.7 Griffin/CSX Safety Improvement Analysis Summary

Intersection	Existing Expected Crash Frequency	Proposed Installation	Component Crash Reduction Factor	Proposed Expected Crash Frequency	ECF Savings	ECF Annual Safety Benefit	Initial Cost	Annual Cost	Safey Benefit-Cost Ratio
Griffin/CSX	0.035	CWT Upgrade	0.26	0.026	0.009	$3,439	$100,000	$ 8,000.00	0.4
Griffin/CSX	0.035	Gates, Urban	0.57	0.012	0.023	$8,691	$250,000	$ 20,000.00	0.4
Griffin/CSX	0.035	Gates, Urban with Flexible Delineators	0.89	0.004	0.031	$11,804	$266,000	$ 21,280.00	0.6
Griffin/CSX	0.035	Gates, Urban Mountable Median	0.89	0.004	0.031	$11,804	$280,000	$ 22,400.00	0.5
Griffin/CSX	0.035	Gates, Urban Raised Median	0.91	0.003	0.032	$12,088	$308,000	$ 24,640.00	0.5
Griffin/CSX	0.035	Grade Separation	1.00	0.000	0.035	$13,225	$7,000,000	$300,000.00	0.04

Construction of urban gates at this location would have minimal affect to adjacent properties (see Figure 3.5). The benefit cost ratio for the installation of the urban gates is only 0.4.

The calculation for benefit/cost of delay with respect to a grade separation is shown in Table 3.8.

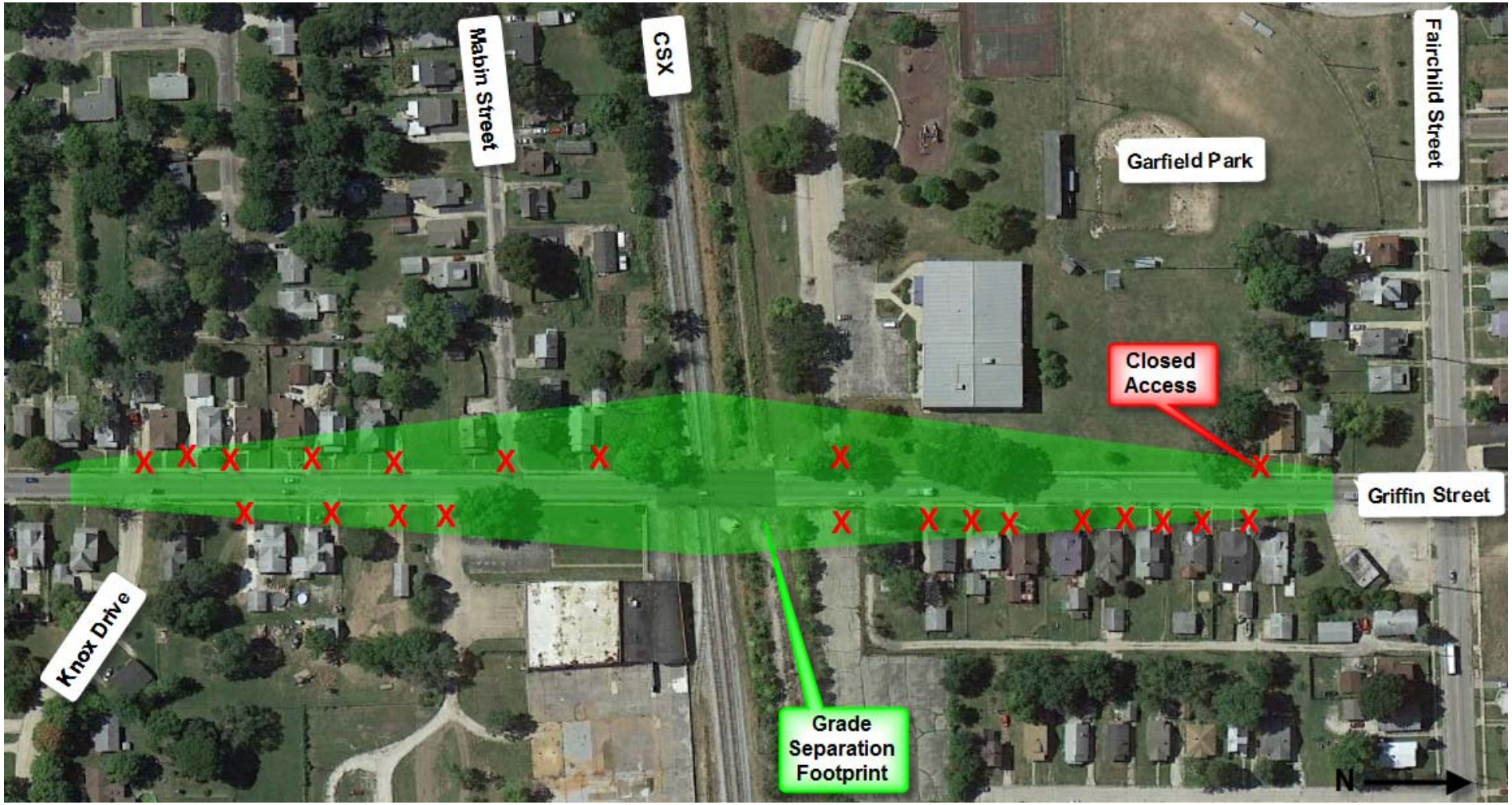
Table 3.8 Griffin/CSX Delay Benefit/Cost Summary

Proposed Installation	2034 Total Daily Delay Experienced by All Motorists Collectively (Hours)	2034 Total Delay Experienced by All Motorists Collectively (Hours/Year)	Annual Delay Benefit	ECF Annual Safety Benefit	Total Benefit for Grade Separation	Annual Cost	Delay and Safety Benefit-Cost Ratio
CWT Upgrade	46.67	17035	$103,531	$3,439	$106,969	$8,000	13.4
Grade Separation	46.67	17035	$340,691	$13,225	$353,916	$300,000	1.2

The construction of a grade separation at this location would impact several residential properties, Garfield Park, require total acquisitions due to loss of public highway access or significant changes in the existing access currently provided for from Griffin Street (see Figure 3.8). A combination of MSE walls and frontage roads could mitigate the need to acquire full properties, which could be explored during more detailed study. The benefit cost ratio of the proposed grade separation based on the reduction of delay and safety improvements would be 1.2. Upgrading the circuitry to CWT would provide a 30% delay reduction and the benefit cost ratio of this improvement is 13.4.

Figure 3.7 Griffin/CSX Urban Gates

Figure 3.8 Griffin/CSX Grade Separation



4. Recommendations

This study recommends safety or delay improvements based on the data presented in this document. It should be used as a guide for future improvements, based on additional site specific studies, where required, confirming the assumptions made in this report.

Safety improvements recommended will require the confirmation of improvements based on the analysis of a diagnostic team evaluation of the crossing in the field. While this report recommends the minimum required safety improvement to meet the IDOT guidelines, a diagnostic team evaluation may recommend a lower level improvement if deemed justified by field conditions.

Recommended delay improvements, if provided, will need to be confirmed with a site specific engineering analysis and environmental review.

The preparation of an IDOT Project Development Report (PDR) will most likely be required for the recommended improvements due to the access changes required. These PDR's will most likely be processed as a Categorical Exclusion II (CEII) document.

See Figures 4.1 and 4.2 for a summary of the proposed recommendations.

4.1 Voorhees Street / NS

Safety Improvement – It is recommended that a raised median be installed along Voorhees Street to meet the IDOT recommended expected crash frequency at this location. The benefit cost ratio of 6.0 shows a significant public safety benefit for this improvement. This improvement may need to be balanced with the suggested delay improvement, possibly including the installation of flexible delineators as a short term, low cost acceptable solution for increased safety. Either the median or flexible delineator installation will need to address the loss of two-way access to the City of Danville Public Works facility and the commercial business southeast of the crossing. For this study, it was assumed that right-in/right-out access would be maintained, which would not require a payment of damages to the property owner.

Delay Improvement – It is recommended that an IDOT Project Development Report (PDR) be completed for a proposed grade separation at this location. The delay and safety benefit cost ratio of 1.4 shows a benefit to the public if this improvement were completed. Based on the 2010 Danville Area Transportation Study (DATS) Long Range Transportation Plan (LRTP), Voorhees Street is expected to be over capacity by 2035. The existence of an at-grade crossing along this route will only exacerbate the delay along the corridor, further supporting the need for a grade separation at this location. A four lane section may be justified based on the future roadway capacity needs.

4.2 Bowman Avenue / NS

Safety Improvement – It is recommended that flexible delineators be installed along Bowman Avenue to meet the IDOT recommended expected crash frequency at this location. The benefit cost ratio of 10.8 is extremely high, based on the relatively low cost of the delineators and the high safety return due to the restriction of drivers from driving over the centerline in the vicinity of the rail crossing. However, there may be costs for adjacent commercial businesses due to the change in access along Bowman Avenue which have not been accounted for in this analysis. Changes in access to the adjacent road

intersections of English and Maple Streets may also be undesirable to adjacent landowners. However, even with the mitigation of these impacts, the benefit could still be higher than the costs.

Delay Improvement – It is recommended that an IDOT Project Development Report (PDR) be completed for a proposed grade separation at this location. The delay and safety benefit cost ratio of 1.0 shows the cost and benefit to the public is equal if this improvement were completed. However, based on the 2010 Danville Area Transportation Study (DATS) Long Range Transportation Plan (LRTP), Bowman Avenue is expected to be over capacity by 2035 in the vicinity of this crossing. The existence of an at-grade crossing along this route will only exacerbate the delay along the corridor, further supporting the need for a grade separation at this location.

4.3 Williams Street / NS

Safety Improvement – It is recommended that flexible delineators be installed along Williams Street to meet the IDOT recommended expected crash frequency at this location. Also, as a baseline improvement to this location, the train signaling equipment should be upgraded to CWT as well. The benefit cost ratio of 6.6 shows this safety improvement would be beneficial. The challenge of this improvement would also be maintaining access along the major highway, and in this case, the horizontal curve located within the crossing itself. With two adjacent side streets parallel to the tracks and businesses in close proximity, the challenge of access would remain. Also, should the side streets not be restricted to right-in/right-out access or closed, it would be recommended to include side street gates in addition the side street lights currently installed to help prevent vehicles from crossing the tracks when the Williams Street gates are closed.

Delay Improvement – It is not recommended that a grade separation be constructed at this location at this time. Even though the expected benefit cost ratio is over one, it is recommended to focus efforts towards the Voorhees Street grade separation in order to have the most significant benefit among the crossings studied. Also, upgrading the circuitry at this location to CWT would decrease the delay by up to 30% for substantially less than the expected cost of the grade separation.

4.4 Griffin Street / CSX

Safety Improvement – It is recommended that this crossing should have warning gates installed and the train signaling system upgraded to CWT to meet the IDOT recommended expected crash frequency criteria. The benefit cost ratio of 0.4 shows that the impact of this safety improvement does not match the significance of other crossing improvements, however the implementation of the CWT and gates for both safety and delay has a very high benefit/cost ratio of 13.4, showing the public benefit that would still be gained by implementing these upgrades.

Delay Improvement – It is not recommended that a grade separation be constructed at this location at this time. Even though the expected benefit cost ratio is over one, it is recommended to focus efforts towards the Voorhees Street grade separation in order to have the most significant benefit among the crossings studied. Also, upgrading the circuitry at this location to CWT would decrease the delay by up to 30% for substantially less than the expected cost of the grade separation.

Figure 4.1 Additional Crossing Study Safety Improvement Recommendations

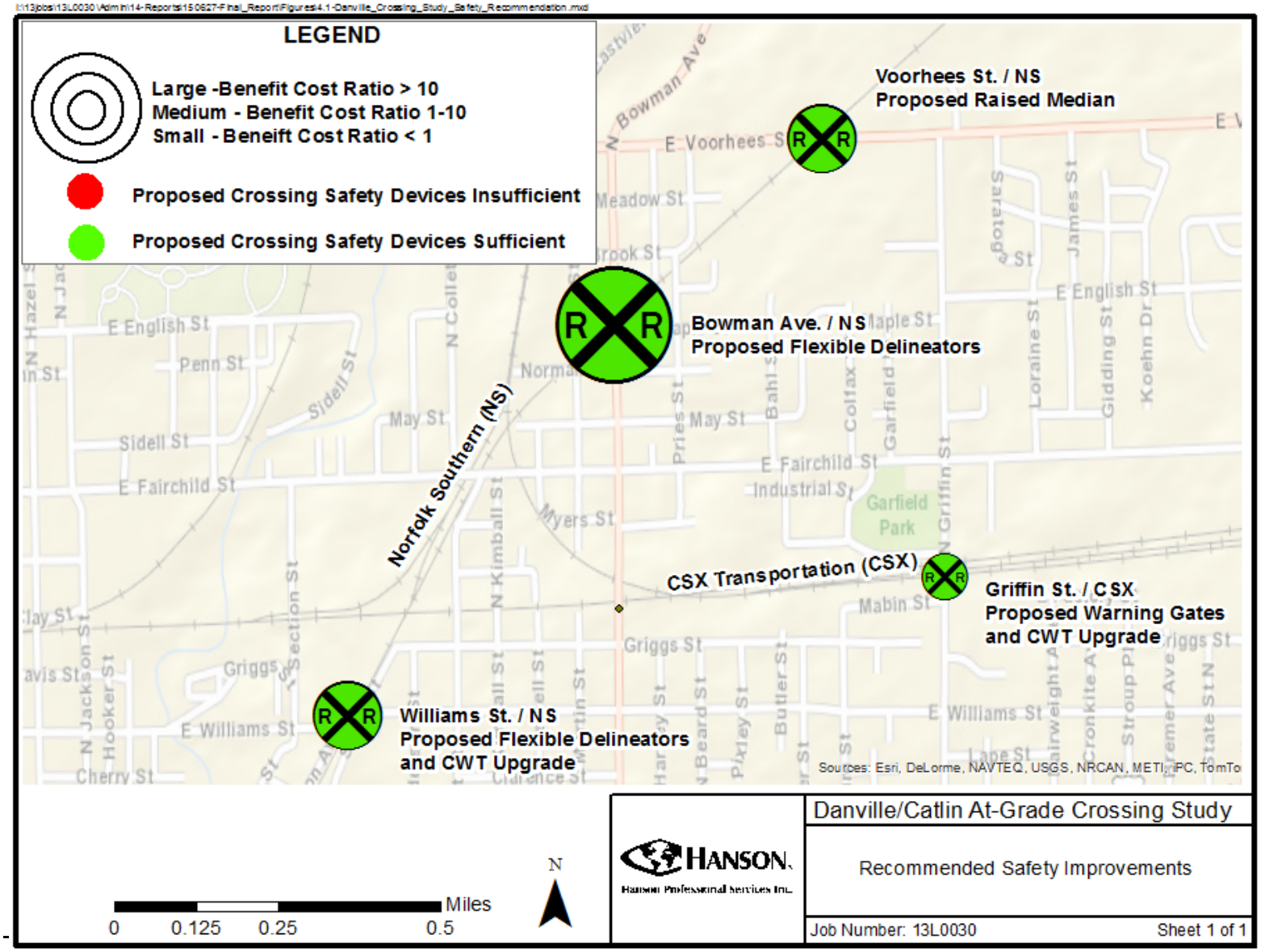
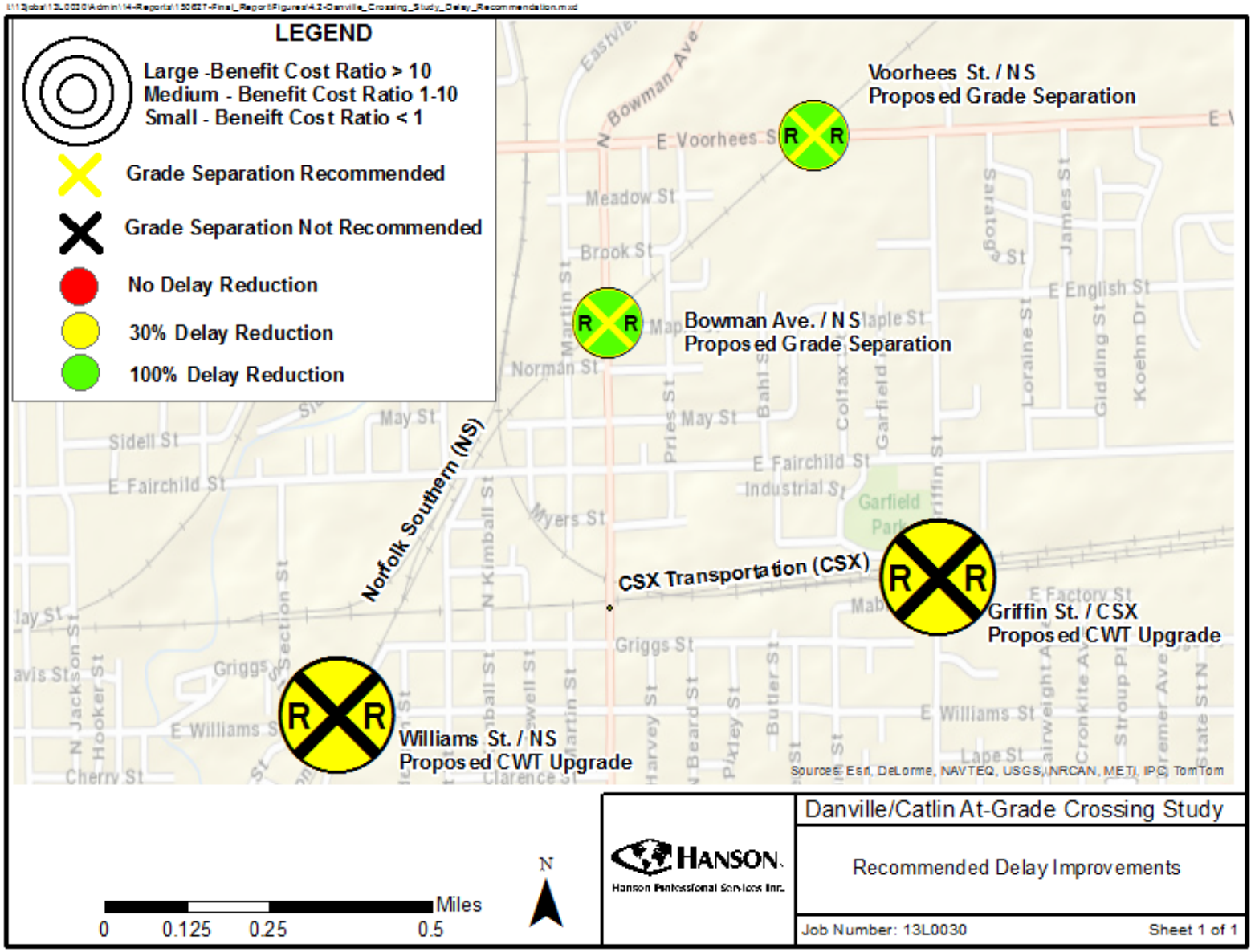


Figure 4.2 Additional Crossing Study Delay Improvement Recommendations



Appendix A – Draft Voorhees / NS IDOT HSIP Application for Raised Median

Illinois Department of Transportation

HSIP Candidate Form

FY

ID:	**Contract:**	**Award Date:**	**Completion Date:**
District: 5	**County:** Vermillion		**City:** Danville
Key route:	**Marked route:**		
Road Name: E. Voorhees Street	**Intersecting Roadway:** Norfolk Southern RR N/A ☐		
Length: 0 ☒ N/A		**Mile station:** to	

Location Description: Voorhess Street and NSRR At-Grade Rail Crossing

☐ **Rural**	☒ **Urban**	**Lanes:** 2	
AADT(Segment):	**Total Entering AADT (Intersection): 15800**		**Speed Limit:** 35 mph
Friction Test Results:	☒ N/A	**Lighting Present:** ☐ Y ☒ N	

CHSP Emphasis Area(s): Highway-Railroad Grade Crossing ☐ District Documentation ☐ Systematic Improvements ☐ N/A

Peer Group: 1-Urban Two-Way Street ☐ N/A

Other:

Crashes Details

Year	Total Crashes	Fatal Crashes	Fatalities	A-Injury Crashes	A-Injuries	B-Injury Crashes	B-Injuries	C-Injury Crashes	C-Injuries	PDO	Wet-Weather Crashes	Darkness (Not lighted) Crashes
2007	0											
2008	1							1				
2009	3					1				2		2
2010	1					1					1	1
2011	4									3	4	1
Total	9					2		1		5	6	4

Location Description: At grade crossing of the N/S and Voorhees Street

Problem Description: Expected Crash Frequency in excess of BLRS Chapter 40-2 criteria indicating the need for a higher type crossing safety device

Previous Safety Improvements: None known

Collision Diagram: ☐ Y ☒ N **Images:** ☒ Y ☐ N

Predominant Crash Types: Rear End

Proposed Improvement(s): Raised Median

Estimated Project Cost ($000's): $58 **Benefit-Cost Ratio:** 6.0

Local Projects:

Annual Fatal Crash Rate (Fatal Crashes/100 Miles): **Annual A-Injury Crash Rate (A-Injury Crashes/100 Miles):**

Local Roads Rural Functional Class: Minor Arterial, Urban

Approved: **Central HSIP Approval Date:**

Signed:

State Safety Engineer

Funding: ☐ HSIP ☐ HRRR ☒ RAIL

Comment:

Distribution: ☐ OPP ☐ District ☐ BSE ☐ LRS ☐ BDE

Appendix B – Draft Voorhees / NS ICC GCPF Application for Raised Median

ILLINOIS COMMERCE COMMISSION
CROSSING SAFETY IMPROVEMENT PROGRAM
GRADE CROSSING PROTECTION FUND PROJECT INFORMATION
Public Highway - Rail Bridge Projects

I. General Information

Applicant Type: ☒ City ☐ Village ☐ Town ☐ County ☐ Township ☐ Railroad
Resubmission: ☐ Yes ☒ No Company Name: _____
Applicant Name: City of Danville Population: 32,523
Chief Elected Official: Scott Eisenhauer Title: Mayor
Business Address: 17 W. Main Street
City: Danville State: IL Zip: 61832
Business Phone: (217) 431-2400 Business Fax: _____
Email Address (if applicable): mayor@cityofdanville.org
State Legislative District: 52 (Senator Michael Frerichs)

II. Project Administrator

Contact Person: David Schnelle Title: Director Engineering and Urban
Company: City of Danville
Address: 1155 E. Voorhees Street, Suite A
City: Danville State: IL Zip: 61832
Business Phone: (217) 431-2384 Business Fax: _____
Email Address (if applicable): dschnelle@cityofdanville.org

III. General Project Information

(Note: Attach separate sheet listing all crossings if applying for more than one crossing improvement)
County: Vermillion ☒ In City ☐ Near City City: Danville
Street/Roadway Name: Voorhees Street
Railroad: Norfolk Southern Crossing Number: 479854T Railroad Milepost 299.87
Average Daily Traffic (ADT): 15,800 (Number of Cars per Day over the Crossing) Daily Train Traffic: 22 (Number of Trains per Day)
Number of School Buses over Crossing per Day: _____
Do vehicles carrying hazardous materials use crossing? ☐ Yes ☐ No
If yes, list the type and approximate number of hazardous material vehicles using the crossing per day:
_____
Number of tracks through crossing: 2
Distance to, and street name of, the two nearest existing grade separations from location being applied for:
_____
Crossing is currently: ☐ Grade Seperation ☒ An At-Grade Crossing ☐ No Crossing
If crossing is currently a grade crossing, identify the existing warning device type:
☐ None ☐ Center Median or Median Barriers ☒ Automatic Flashing Light Signals and Gates
☐ Automatic Flashing Light Signals ☐ STOP Signs Only ☐ Crossbucks Only
☐ Other (please specify) _____
Are railroad signals interconnected with traffic signals at this location: ☐ Yes ☒ No ☐ N/A
If nearest roadway crossing is currently a grade seperation, provide the following information:
☐ Highway Over Railroad ☐ Highway Under Railroad
Number of Traffic Lanes _____ Width of Pavement _____
Vertical Clearance _____

IV. Project Location Map and/or Photographs

A project location map must be included with the application. The project location map must show the crossing(s) for which application is being submitted, as well as any other improvements that are being submitted in conjunction with this application. If project is a part of a "corridor" project, indicate the limits of the entire "corridor" on the map. Paper size shall not exceed 11 x 17 inches. **If the bridge will replace a grade crossing, provide a minimum of 4 digital photographs of the existing crossing (photos should show the existing warning devices, the existing crossing surface, and the existing highway approaches). If the new structure will replace an existing bridge, provide a minimum of 3 digital photographs of the existing structure (photos should show the width of the existing roadway surface on the bridge, the existing bridge spanning the railroad track, and the existing highway approaches.)**

V. Project Summary.

Application to (check all that apply):

☐ Reconstruct Existing Grade Separation ☐ Construct New Grade Separation

☐ Close Adjacent Crossing ☐ Increase Vertical Clearance at Highway Underpass

☒ Other (please specify) Construction of raised medians

Is application for: ☐ Design Only ☐ Construction only ☐ Design and Construction

Is application part of a larger "corridor" project: ☐ Yes ☐ No

Use the space below to provide a narrative of the proposed project. Items to include in this section are extenuating circumstances unique to this crossing, such as heavier seasonal traffic, visibility restrictions caused by trees, buildings, etc., proximity of schools and public buildings, etc., which explain why this crossing should be funded. Explain any work to by done by the local agency, such as roadway improvements in the immediate vicinity of the grade separation project. Approximate costs must be listed for each item of work to be done.

VI. Evidence of Community Effort and Support

Any preliminary engineering or planning studies, along with cost estimates, that have been prepared for this project must be included with your application. List any past efforts to improve safety at railroad crossings within applicant's jurisdiction. Any studies that have been conducted, regarding railroad crossing elimination or consolidation, must also be included.

VII. Financial Need

This narrative must justify the local government's need for assistance from the GCPF. One copy of the applicant's most recent financial audit must be included with your application (local government agencies only).

VIII. Project Schedule

Provide information on when this project is anticipated to commence, or when improvements must be implemented. Provide an approximate timeline listing key milestones concerning the design and/or construction phases of the project.

Print Form | Reset Form

Appendix C – Draft Voorhees / NS ICC GCPF Application for Grade Separation

ILLINOIS COMMERCE COMMISSION
CROSSING SAFETY IMPROVEMENT PROGRAM
GRADE CROSSING PROTECTION FUND PROJECT INFORMATION
Public Highway - Rail Bridge Projects

I. General Information

Applicant Type: ☒ City ☐ Village ☐ Town ☐ County ☐ Township ☐ Railroad
Resubmission: ☐ Yes ☒ No Company Name:
Applicant Name: City of Danville Population: 32,523
Chief Elected Official: Scott Eisenhauer Title: Mayor
Business Address: 17 W. Main Street
City: Danville State: IL Zip: 61832
Business Phone: (217) 431-2400 Business Fax:
Email Address (if applicable): mayor@cityofdanville.org
State Legislative District: 52 (Senator Michael Frerichs)

II. Project Administrator

Contact Person: David Schnelle Title: Director Engineering and Urban
Company: City of Danville
Address: 1155 E. Voorhees Street, Suite A
City: Danville State: IL Zip: 61832
Business Phone: (217) 431-2384 Business Fax:
Email Address (if applicable): dschnelle@cityofdanville.org

III. General Project Information

(Note: Attach separate sheet listing all crossings if applying for more than one crossing improvement)
County: Vermillion ☒ In City ☐ Near City City: Danville
Street/Roadway Name: Voorhees Street
Railroad: Norfolk Southern Crossing Number: 479854T Railroad Milepost 299.87

Average Daily Traffic (ADT): 15,800 (Number of Cars per Day over the Crossing) Daily Train Traffic: 22 (Number of Trains per Day)
Number of School Buses over Crossing per Day:
Do vehicles carrying hazardous materials use crossing? ☐ Yes ☐ No
If yes, list the type and approximate number of hazardous material vehicles using the crossing per day:

Number of tracks through crossing: 2
Distance to, and street name of, the two nearest existing grade separations from location being applied for:

Crossing is currently: ☐ Grade Seperation ☒ An At-Grade Crossing ☐ No Crossing
If crossing is currently a grade crossing, identify the existing warning device type:
☐ None ☐ Center Median or Median Barriers ☒ Automatic Flashing Light Signals and Gates
☐ Automatic Flashing Light Signals ☐ STOP Signs Only ☐ Crossbucks Only
☐ Other (please specify)

Are railroad signals interconnected with traffic signals at this location: ☐ Yes ☒ No ☐ N/A
If nearest roadway crossing is currently a grade seperation, provide the following information:
☐ Highway Over Railroad ☐ Highway Under Railroad
Number of Traffic Lanes Width of Pavement
Vertical Clearance

IV. Project Location Map and/or Photographs

A project location map must be included with the application. The project location map must show the crossing(s) for which application is being submitted, as well as any other improvements that are being submitted in conjunction with this application. If project is a part of a "corridor" project, indicate the limits of the entire "corridor" on the map. Paper size shall not exceed 11 x 17 inches. **If the bridge will replace a grade crossing, provide a minimum of 4 digital photographs of the existing crossing (photos should show the existing warning devices, the existing crossing surface, and the existing highway approaches). If the new structure will replace an existing bridge, provide a minimum of 3 digital photographs of the existing structure (photos should show the width of the existing roadway surface on the bridge, the existing bridge spanning the railroad track, and the existing highway approaches.)**

V. Project Summary.

Application to (check all that apply):

☐ Reconstruct Existing Grade Separation ☒ Construct New Grade Separation

☐ Close Adjacent Crossing ☐ Increase Vertical Clearance at Highway Underpass

☐ Other (please specify) _____

Is application for: ☐ Design Only ☐ Construction only ☐ Design and Construction

Is application part of a larger "corridor" project: ☐ Yes ☐ No

Use the space below to provide a narrative of the proposed project. Items to include in this section are extenuating circumstances unique to this crossing, such as heavier seasonal traffic, visibility restrictions caused by trees, buildings, etc., proximity of schools and public buildings, etc., which explain why this crossing should be funded. Explain any work to by done by the local agency, such as roadway improvements in the immediate vicinity of the grade separation project. Approximate costs must be listed for each item of work to be done.

VI. Evidence of Community Effort and Support

Any preliminary engineering or planning studies, along with cost estimates, that have been prepared for this project must be included with your application. List any past efforts to improve safety at railroad crossings within applicant's jurisdiction. Any studies that have been conducted, regarding railroad crossing elimination or consolidation, must also be included.

VII. Financial Need

This narrative must justify the local government's need for assistance from the GCPF. One copy of the applicant's most recent financial audit must be included with your application (local government agencies only).

VIII. Project Schedule

Provide information on when this project is anticipated to commence, or when improvements must be implemented. Provide an approximate timeline listing key milestones concerning the design and/or construction phases of the project.

Print Form | Reset Form

Appendix D – Draft Bowman / NS IDOT HSIP Application for Flexible Delineator Installation

Illinois Department of Transportation

HSIP Candidate Form

FY

ID:	**Contract:**	**Award Date:**	**Completion Date:**
District: 5	**County:** Vermillion		**City:** Danville
Key route:	**Marked route:**		
Road Name: N. Bowman Avenue	**Intersecting Roadway:** Norfolk Southern RR N/A ☐		
Length: 0 ☒ N/A		**Mile station:** to	

Location Description:

☐ **Rural**	☒ **Urban**	**Lanes:** 2	
AADT(Segment):	**Total Entering AADT (Intersection): 8000**		**Speed Limit:** 30 mph
Friction Test Results:	☒ N/A	**Lighting Present:** ☐ Y ☒ N	

CHSP Emphasis Area(s): Highway-Railroad Grade Crossing ☐ District Documentation ☐ Systematic Improvements ☐ N/A

Peer Group: 1-Urban Two-Way Street ☐ N/A

Other:

Crashes Details

Year	Total Crashes	Fatal Crashes	Fatalities	A-Injury Crashes	A-Injuries	B-Injury Crashes	B-Injuries	C-Injury Crashes	C-Injuries	PDO	Wet-Weather Crashes	Darkness (Not lighted) Crashes
2007	0											
2008	3					2		1				
2009	2									2		0
2010	2									2	1	0
2011	8					3		2		3	2	3
Total	15					5		3		7	3	3

Location Description:

Problem Description:

Previous Safety Improvements: None known

Collision Diagram: ☐ Y ☒ N **Images:** ☒ Y ☐ N

Predominant Crash Types: Rear End (40%) and Turning (20%)

Proposed Improvement(s): Flexible Delineator Installation

Estimated Project Cost ($000's): $16 **Benefit-Cost Ratio:** 10.8

Local Projects: Expected Crash Frequency in excess of BLRS Chapter 40-2 criteria indicating the need for a higher type crossing safety device

Annual Fatal Crash Rate (Fatal Crashes/100 Miles): **Annual A-Injury Crash Rate (A-Injury Crashes/100 Miles):**

Local Roads Rural Functional Class: Minor Arterial, Urban

Approved: **Central HSIP Approval Date:**

Signed:

State Safety Engineer

Funding: ☐ HSIP ☐ HRRR ☒ RAIL

Comment:

Distribution: ☐ OPP ☐ District ☐ BSE ☐ LRS ☐ BDE

Appendix E – Draft Bowman / NS ICC GCPF Application for Flexible Delineator Installation

ILLINOIS COMMERCE COMMISSION
CROSSING SAFETY IMPROVEMENT PROGRAM
GRADE CROSSING PROTECTION FUND PROJECT INFORMATION
Public Highway - Rail Bridge Projects

I. General Information

Applicant Type: ☒ City ☐ Village ☐ Town ☐ County ☐ Township ☐ Railroad
Resubmission: ☐ Yes ☒ No Company Name: _____
Applicant Name: City of Danville Population: 32,523
Chief Elected Official: Scott Eisenhauer Title: Mayor
Business Address: 17 W. Main Street
City: Danville State: IL Zip: 61832
Business Phone: (217) 431-2400 Business Fax: _____
Email Address (if applicable): mayor@cityofdanville.org
State Legislative District: 52 (Senator Michael Frerichs)

II. Project Administrator

Contact Person: David Schnelle Title: Director Engineering and Urban
Company: City of Danville
Address: 1155 E. Voorhees Street, Suite A
City: Danville State: IL Zip: 61832
Business Phone: (217) 431-2384 Business Fax: _____
Email Address (if applicable): dschnelle@cityofdanville.org

III. General Project Information

(Note: Attach separate sheet listing all crossings if applying for more than one crossing improvement)

County: Vermillion ☒ In City ☐ Near City City: Danville
Street/Roadway Name: Bowman Avenue
Railroad: Norfolk Southern Crossing Number: 479856G Railroad Milepost 300.28

Average Daily Traffic (ADT): 8,000 (Number of Cars per Day over the Crossing) Daily Train Traffic: 48 (Number of Trains per Day)
Number of School Buses over Crossing per Day: _____
Do vehicles carrying hazardous materials use crossing? ☐ Yes ☐ No
If yes, list the type and approximate number of hazardous material vehicles using the crossing per day:

Number of tracks through crossing: 2
Distance to, and street name of, the two nearest existing grade separations from location being applied for:

Crossing is currently: ☐ Grade Seperation ☒ An At-Grade Crossing ☐ No Crossing
If crossing is currently a grade crossing, identify the existing warning device type:

☐ None ☐ Center Median or Median Barriers ☒ Automatic Flashing Light Signals and Gates
☐ Automatic Flashing Light Signals ☐ STOP Signs Only ☐ Crossbucks Only
☐ Other (please specify) _____

Are railroad signals interconnected with traffic signals at this location: ☐ Yes ☒ No ☐ N/A
If nearest roadway crossing is currently a grade seperation, provide the following information:

☐ Highway Over Railroad ☐ Highway Under Railroad
Number of Traffic Lanes _____ Width of Pavement _____
Vertical Clearance _____

IV. Project Location Map and/or Photographs

A project location map must be included with the application. The project location map must show the crossing(s) for which application is being submitted, as well as any other improvements that are being submitted in conjunction with this application. If project is a part of a "corridor" project, indicate the limits of the entire "corridor" on the map. Paper size shall not exceed 11 x 17 inches. **If the bridge will replace a grade crossing, provide a minimum of 4 digital photographs of the existing crossing (photos should show the existing warning devices, the existing crossing surface, and the existing highway approaches). If the new structure will replace an existing bridge, provide a minimum of 3 digital photographs of the existing structure (photos should show the width of the existing roadway surface on the bridge, the existing bridge spanning the railroad track, and the existing highway approaches.)**

V. Project Summary.

Application to (check all that apply):

☐ Reconstruct Existing Grade Separation ☐ Construct New Grade Separation

☐ Close Adjacent Crossing ☐ Increase Vertical Clearance at Highway Underpass

☒ Other (please specify) Flexible Delineator Installation

Is application for: ☐ Design Only ☐ Construction only ☐ Design and Construction

Is application part of a larger "corridor" project: ☐ Yes ☐ No

Use the space below to provide a narrative of the proposed project. Items to include in this section are extenuating circumstances unique to this crossing, such as heavier seasonal traffic, visibility restrictions caused by trees, buildings, etc., proximity of schools and public buildings, etc., which explain why this crossing should be funded. Explain any work to by done by the local agency, such as roadway improvements in the immediate vicinity of the grade separation project. Approximate costs must be listed for each item of work to be done.

VI. Evidence of Community Effort and Support

Any preliminary engineering or planning studies, along with cost estimates, that have been prepared for this project must be included with your application. List any past efforts to improve safety at railroad crossings within applicant's jurisdiction. Any studies that have been conducted, regarding railroad crossing elimination or consolidation, must also be included.

VII. Financial Need

This narrative must justify the local government's need for assistance from the GCPF. One copy of the applicant's most recent financial audit must be included with your application (local government agencies only).

VIII. Project Schedule

Provide information on when this project is anticipated to commence, or when improvements must be implemented. Provide an approximate timeline listing key milestones concerning the design and/or construction phases of the project.

Print Form | Reset Form

Appendix F – Draft Bowman / NS ICC GCPF Application for Grade Separation

Illinois Department of Transportation

HSIP Candidate Form

FY

ID:	**Contract:**	**Award Date:**	**Completion Date:**
District: 5	**County:** Vermillion		**City:** Danville
Key route:	**Marked route:**		
Road Name: Williams St.	**Intersecting Roadway:** Norfolk Southern Railway Co. N/A ☐		
Length: 0 ☒ N/A		**Mile station:** to	

Location Description:

☐ **Rural**	☒ **Urban**	**Lanes:** 2	
AADT(Segment):	**Total Entering AADT (Intersection): 5600**		**Speed Limit:** 30 mph
Friction Test Results:	☒ N/A	**Lighting Present:** ☐ Y ☒ N	

CHSP Emphasis Area(s): Highway-Railroad Grade Crossing ☐ District Documentation ☐ Systematic Improvements ☐ N/A

Peer Group: 1-Urban Two-Way Street ☐ N/A

Other:

Crashes Details

Year	Total Crashes	Fatal Crashes	Fatalities	A-Injury Crashes	A-Injuries	B-Injury Crashes	B-Injuries	C-Injury Crashes	C-Injuries	PDO	Wet-Weather Crashes	Darkness (Not lighted) Crashes
2007	1					1						1
2008	0											
2009	2									2		1
2010	5			1		1				3	1	3
2011	1					1					1	1
Total	9			1		3				5	2	6

Location Description: At grade crossing of the N/S and Williams Street

Problem Description: Expected Crash Frequency in excess of BLRS Chapter 40-2 criteria indicating the need for a higher type crossing safety device

Previous Safety Improvements: None known

Collision Diagram: ☐ Y ☒ N **Images:** ☒ Y ☐ N

Predominant Crash Types: Fixed Object

Proposed Improvement(s): Flexible Delineator Installation and Circuitry Upgrade

Estimated Project Cost ($000's): $116 **Benefit-Cost Ratio:** 3.5

Local Projects:

Annual Fatal Crash Rate (Fatal Crashes/100 Miles): **Annual A-Injury Crash Rate (A-Injury Crashes/100 Miles):**

Local Roads Rural Functional Class: Collector, Urban

Approved: **Central HSIP Approval Date:**

Signed:

State Safety Engineer

Funding: ☐ HSIP ☐ HRRR ☒ RAIL

Comment:

Distribution: ☐ OPP ☐ District ☐ BSE ☐ LRS ☐ BDE

Appendix G – Draft Williams / NS IDOT HSIP Application for Flexible Delineator Installation and Circuitry Upgrade

ILLINOIS COMMERCE COMMISSION
CROSSING SAFETY IMPROVEMENT PROGRAM
GRADE CROSSING PROTECTION FUND PROJECT INFORMATION
Public Highway - Rail Bridge Projects

I. General Information

Applicant Type: ☒ City ☐ Village ☐ Town ☐ County ☐ Township ☐ Railroad
Resubmission: ☐ Yes ☒ No Company Name: _____
Applicant Name: City of Danville Population: 32,523
Chief Elected Official: Scott Eisenhauer Title: Mayor
Business Address: 17 W. Main Street
City: Danville State: IL Zip: 61832
Business Phone: (217) 431-2400 Business Fax: _____
Email Address (if applicable): mayor@cityofdanville.org
State Legislative District: 52 (Senator Michael Frerichs)

II. Project Administrator

Contact Person: David Schnelle Title: Director Engineering and Urban
Company: City of Danville
Address: 1155 E. Voorhees Street, Suite A
City: Danville State: IL Zip: 61832
Business Phone: (217) 431-2384 Business Fax: _____
Email Address (if applicable): dschnelle@cityofdanville.org

III. General Project Information

(Note: Attach separate sheet listing all crossings if applying for more than one crossing improvement)
County: Vermillion ☒ In City ☐ Near City City: Danville
Street/Roadway Name: Bowman Avenue
Railroad: Norfolk Southern Crossing Number: 479856G Railroad Milepost 300.28

Average Daily Traffic (ADT): 8,000 (Number of Cars per Day over the Crossing) Daily Train Traffic: 48 (Number of Trains per Day)
Number of School Buses over Crossing per Day: _____
Do vehicles carrying hazardous materials use crossing? ☐ Yes ☐ No
If yes, list the type and approximate number of hazardous material vehicles using the crossing per day:
_____
Number of tracks through crossing: 2
Distance to, and street name of, the two nearest existing grade separations from location being applied for:
_____
Crossing is currently: ☐ Grade Seperation ☒ An At-Grade Crossing ☐ No Crossing
If crossing is currently a grade crossing, identify the existing warning device type:
☐ None ☐ Center Median or Median Barriers ☒ Automatic Flashing Light Signals and Gates
☐ Automatic Flashing Light Signals ☐ STOP Signs Only ☐ Crossbucks Only
☐ Other (please specify) _____
Are railroad signals interconnected with traffic signals at this location: ☐ Yes ☒ No ☐ N/A
If nearest roadway crossing is currently a grade seperation, provide the following information:
☐ Highway Over Railroad ☐ Highway Under Railroad
Number of Traffic Lanes _____ Width of Pavement _____
Vertical Clearance _____

IV. Project Location Map and/or Photographs

A project location map must be included with the application. The project location map must show the crossing(s) for which application is being submitted, as well as any other improvements that are being submitted in conjunction with this application. If project is a part of a "corridor" project, indicate the limits of the entire "corridor" on the map. Paper size shall not exceed 11 x 17 inches. **If the bridge will replace a grade crossing, provide a minimum of 4 digital photographs of the existing crossing (photos should show the existing warning devices, the existing crossing surface, and the existing highway approaches). If the new structure will replace an existing bridge, provide a minimum of 3 digital photographs of the existing structure (photos should show the width of the existing roadway surface on the bridge, the existing bridge spanning the railroad track, and the existing highway approaches.)**

V. Project Summary.

Application to (check all that apply):

☐ Reconstruct Existing Grade Separation ☒ Construct New Grade Separation

☐ Close Adjacent Crossing ☐ Increase Vertical Clearance at Highway Underpass

☐ Other (please specify) _____

Is application for: ☐ Design Only ☐ Construction only ☐ Design and Construction

Is application part of a larger "corridor" project: ☐ Yes ☐ No

Use the space below to provide a narrative of the proposed project. Items to include in this section are extenuating circumstances unique to this crossing, such as heavier seasonal traffic, visibility restrictions caused by trees, buildings, etc., proximity of schools and public buildings, etc., which explain why this crossing should be funded. Explain any work to by done by the local agency, such as roadway improvements in the immediate vicinity of the grade separation project. Approximate costs must be listed for each item of work to be done.

VI. Evidence of Community Effort and Support

Any preliminary engineering or planning studies, along with cost estimates, that have been prepared for this project must be included with your application. List any past efforts to improve safety at railroad crossings within applicant's jurisdiction. Any studies that have been conducted, regarding railroad crossing elimination or consolidation, must also be included.

VII. Financial Need

This narrative must justify the local government's need for assistance from the GCPF. One copy of the applicant's most recent financial audit must be included with your application (local government agencies only).

VIII. Project Schedule

Provide information on when this project is anticipated to commence, or when improvements must be implemented. Provide an approximate timeline listing key milestones concerning the design and/or construction phases of the project.

Print Form | Reset Form

AppendixH – Draft Williams / NS ICC GCPF Application for Flexible Delineator Installation and Circuitry Upgrade

ILLINOIS COMMERCE COMMISSION
CROSSING SAFETY IMPROVEMENT PROGRAM
GRADE CROSSING PROTECTION FUND PROJECT INFORMATION
Public Highway - Rail Bridge Projects

I. General Information

Applicant Type: ☒ City ☐ Village ☐ Town ☐ County ☐ Township ☐ Railroad
Resubmission: ☐ Yes ☒ No Company Name:
Applicant Name: City of Danville Population: 32,523
Chief Elected Official: Scott Eisenhauer Title: Mayor
Business Address: 17 W. Main Street
City: Danville State: IL Zip: 61832
Business Phone: (217) 431-2400 Business Fax:
Email Address (if applicable): mayor@cityofdanville.org
State Legislative District: 52 (Senator Michael Frerichs)

II. Project Administrator

Contact Person: David Schnelle Title: Director Engineering and Urban
Company: City of Danville
Address: 1155 E. Voorhees Street, Suite A
City: Danville State: IL Zip: 61832
Business Phone: (217) 431-2384 Business Fax:
Email Address (if applicable): dschnelle@cityofdanville.org

III. General Project Information

(Note: Attach separate sheet listing all crossings if applying for more than one crossing improvement)
County: Vermillion ☒ In City ☐ Near City City: Danville
Street/Roadway Name: Williams Street
Railroad: Norfolk Southern Crossing Number: 479859C Railroad Milepost 301.02

Average Daily Traffic (ADT): 5,600 (Number of Cars per Day over the Crossing) Daily Train Traffic: 22 (Number of Trains per Day)
Number of School Buses over Crossing per Day:
Do vehicles carrying hazardous materials use crossing? ☐ Yes ☐ No
If yes, list the type and approximate number of hazardous material vehicles using the crossing per day:

Number of tracks through crossing: 3
Distance to, and street name of, the two nearest existing grade separations from location being applied for:

Crossing is currently: ☐ Grade Seperation ☒ An At-Grade Crossing ☐ No Crossing
If crossing is currently a grade crossing, identify the existing warning device type:

☐ None ☐ Center Median or Median Barriers ☒ Automatic Flashing Light Signals and Gates
☐ Automatic Flashing Light Signals ☐ STOP Signs Only ☐ Crossbucks Only
☐ Other (please specify)

Are railroad signals interconnected with traffic signals at this location: ☐ Yes ☒ No ☐ N/A
If nearest roadway crossing is currently a grade seperation, provide the following information:
☐ Highway Over Railroad ☐ Highway Under Railroad
Number of Traffic Lanes Width of Pavement
Vertical Clearance

IV. Project Location Map and/or Photographs

A project location map must be included with the application. The project location map must show the crossing(s) for which application is being submitted, as well as any other improvements that are being submitted in conjunction with this application. If project is a part of a "corridor" project, indicate the limits of the entire "corridor" on the map. Paper size shall not exceed 11 x 17 inches. **If the bridge will replace a grade crossing, provide a minimum of 4 digital photographs of the existing crossing (photos should show the existing warning devices, the existing crossing surface, and the existing highway approaches). If the new structure will replace an existing bridge, provide a minimum of 3 digital photographs of the existing structure (photos should show the width of the existing roadway surface on the bridge, the existing bridge spanning the railroad track, and the existing highway approaches.)**

V. Project Summary.

Application to (check all that apply):

☐ Reconstruct Existing Grade Separation ☐ Construct New Grade Separation

☐ Close Adjacent Crossing ☐ Increase Vertical Clearance at Highway Underpass

☒ Other (please specify) Flexible Delineator Installation and Circuitry Upgrade

Is application for: ☐ Design Only ☐ Construction only ☐ Design and Construction

Is application part of a larger "corridor" project: ☐ Yes ☐ No

Use the space below to provide a narrative of the proposed project. Items to include in this section are extenuating circumstances unique to this crossing, such as heavier seasonal traffic, visibility restrictions caused by trees, buildings, etc., proximity of schools and public buildings, etc., which explain why this crossing should be funded. Explain any work to by done by the local agency, such as roadway improvements in the immediate vicinity of the grade separation project. Approximate costs must be listed for each item of work to be done.

VI. Evidence of Community Effort and Support

Any preliminary engineering or planning studies, along with cost estimates, that have been prepared for this project must be included with your application. List any past efforts to improve safety at railroad crossings within applicant's jurisdiction. Any studies that have been conducted, regarding railroad crossing elimination or consolidation, must also be included.

VII. Financial Need

This narrative must justify the local government's need for assistance from the GCPF. One copy of the applicant's most recent financial audit must be included with your application (local government agencies only).

VIII. Project Schedule

Provide information on when this project is anticipated to commence, or when improvements must be implemented. Provide an approximate timeline listing key milestones concerning the design and/or construction phases of the project.

Print Form | Reset Form

Appendix I – Draft Griffin / CSX IDOT HSIP Application for Warning Gates Installation and Circuitry Upgrade

Illinois Department of Transportation

HSIP Candidate Form

FY

ID:	**Contract:**	**Award Date:**	**Completion Date:**
District: 5	**County:** Vermillion		**City:** Danville
Key route:	**Marked route:**		
Road Name: Griffin Street	**Intersecting Roadway:** CSX Transportation, Inc. N/A ☐		
Length: ☒ N/A		**Mile station:** to	

Location Description:

☐ **Rural**	☒ **Urban**	**Lanes:** 2	
AADT(Segment):	**Total Entering AADT (Intersection): 7100**		**Speed Limit:** 30 mph
Friction Test Results:	☒ N/A	**Lighting Present:** ☐ Y ☒ N	

CHSP Emphasis Area(s): Highway-Railroad Grade Crossing ☐ District Documentation ☐ Systematic Improvements ☐ N/A

Peer Group: 1-Urban Two-Way Street ☐ N/A

Other:

Crashes Details

Year	Total Crashes	Fatal Crashes	Fatalities	A-Injury Crashes	A-Injuries	B-Injury Crashes	B-Injuries	C-Injury Crashes	C-Injuries	PDO	Wet-Weather Crashes	Darkness (Not lighted) Crashes
2007												
2008												
2009	1					1					1	
2010	3					1				2		2
2011												
Total						2				2	1	2

Location Description: At grade crossing of CSX and Griffin Street

Problem Description:

Previous Safety Improvements: None known

Collision Diagram: ☐ Y ☒ N **Images:** ☒ Y ☐ N

Predominant Crash Types: Rear End

Proposed Improvement(s): Warning Gates Installation and Circuitry Upgrade

Estimated Project Cost ($000's): $350 **Benefit-Cost Ratio:** 13.4

Local Projects: Expected Crash Frequency in excess of BLRS Chapter 40-2 criteria indicating the need for a higher type crossing safety device

Annual Fatal Crash Rate (Fatal Crashes/100 Miles): **Annual A-Injury Crash Rate (A-Injury Crashes/100 Miles):**

Local Roads Rural Functional Class: Minor Arterial, Urban

Approved: **Central HSIP Approval Date:**

Signed:

State Safety Engineer

Funding: ☐ HSIP ☐ HRRR ☒ RAIL

Comment:

Distribution: ☐ OPP ☐ District ☐ BSE ☐ LRS ☐ BDE

Appendix J – Draft Griffin / CSX ICC GCPF Application for Warning Gates Installation and Circuitry Upgrade

ILLINOIS COMMERCE COMMISSION
CROSSING SAFETY IMPROVEMENT PROGRAM
GRADE CROSSING PROTECTION FUND PROJECT INFORMATION
Public Highway - Rail Bridge Projects

I. General Information

Applicant Type: ☒ City ☐ Village ☐ Town ☐ County ☐ Township ☐ Railroad
Resubmission: ☐ Yes ☒ No Company Name:
Applicant Name: City of Danville Population: 32,523
Chief Elected Official: Scott Eisenhauer Title: Mayor
Business Address: 17 W. Main Street
City: Danville State: IL Zip: 61832
Business Phone: (217) 431-2400 Business Fax:
Email Address (if applicable): mayor@cityofdanville.org
State Legislative District: 52 (Senator Michael Frerichs)

II. Project Administrator

Contact Person: David Schnelle Title: Director Engineering and Urban
Company: City of Danville
Address: 1155 E. Voorhees Street, Suite A
City: Danville State: IL Zip: 61832
Business Phone: (217) 431-2384 Business Fax:
Email Address (if applicable): dschnelle@cityofdanville.org

III. General Project Information

(Note: Attach separate sheet listing all crossings if applying for more than one crossing improvement)
County: Vermillion ☒ In City ☐ Near City City: Danville
Street/Roadway Name: Griffin Street
Railroad: CSX Transportation Crossing Number: 353715W Railroad Milepost 123.86

Average Daily Traffic (ADT): 7,100 (Number of Cars per Day over the Crossing) Daily Train Traffic: 15 (Number of Trains per Day)
Number of School Buses over Crossing per Day:
Do vehicles carrying hazardous materials use crossing? ☐ Yes ☐ No
If yes, list the type and approximate number of hazardous material vehicles using the crossing per day:

Number of tracks through crossing: 2
Distance to, and street name of, the two nearest existing grade separations from location being applied for:

Crossing is currently: ☐ Grade Seperation ☒ An At-Grade Crossing ☐ No Crossing
If crossing is currently a grade crossing, identify the existing warning device type:

☐ None ☐ Center Median or Median Barriers ☐ Automatic Flashing Light Signals and Gates
☒ Automatic Flashing Light Signals ☐ STOP Signs Only ☐ Crossbucks Only
☐ Other (please specify)

Are railroad signals interconnected with traffic signals at this location: ☐ Yes ☒ No ☐ N/A
If nearest roadway crossing is currently a grade seperation, provide the following information:

☐ Highway Over Railroad ☐ Highway Under Railroad
Number of Traffic Lanes Width of Pavement
Vertical Clearance

IV. Project Location Map and/or Photographs

A project location map must be included with the application. The project location map must show the crossing(s) for which application is being submitted, as well as any other improvements that are being submitted in conjunction with this application. If project is a part of a "corridor" project, indicate the limits of the entire "corridor" on the map. Paper size shall not exceed 11 x 17 inches. **If the bridge will replace a grade crossing, provide a minimum of 4 digital photographs of the existing crossing (photos should show the existing warning devices, the existing crossing surface, and the existing highway approaches). If the new structure will replace an existing bridge, provide a minimum of 3 digital photographs of the existing structure (photos should show the width of the existing roadway surface on the bridge, the existing bridge spanning the railroad track, and the existing highway approaches.)**

V. Project Summary.

Application to (check all that apply):

☐ Reconstruct Existing Grade Separation ☐ Construct New Grade Separation

☐ Close Adjacent Crossing ☐ Increase Vertical Clearance at Highway Underpass

☒ Other (please specify) Warning Gates Installation and Circuitry Upgrade

Is application for: ☐ Design Only ☐ Construction only ☐ Design and Construction

Is application part of a larger "corridor" project: ☐ Yes ☐ No

Use the space below to provide a narrative of the proposed project. Items to include in this section are extenuating circumstances unique to this crossing, such as heavier seasonal traffic, visibility restrictions caused by trees, buildings, etc., proximity of schools and public buildings, etc., which explain why this crossing should be funded. Explain any work to by done by the local agency, such as roadway improvements in the immediate vicinity of the grade separation project. Approximate costs must be listed for each item of work to be done.

VI. Evidence of Community Effort and Support

Any preliminary engineering or planning studies, along with cost estimates, that have been prepared for this project must be included with your application. List any past efforts to improve safety at railroad crossings within applicant's jurisdiction. Any studies that have been conducted, regarding railroad crossing elimination or consolidation, must also be included.

VII. Financial Need

This narrative must justify the local government's need for assistance from the GCPF. One copy of the applicant's most recent financial audit must be included with your application (local government agencies only).

VIII. Project Schedule

Provide information on when this project is anticipated to commence, or when improvements must be implemented. Provide an approximate timeline listing key milestones concerning the design and/or construction phases of the project.

Print Form | Reset Form

Appendix K – Voorhees / NS Crossing Photos


479854T-09162009-02.jpg - - W Side of Xing;Hwy Approach looking E
09/16/2009


479854T-09162009-07.jpg - - E Side of Xing;Hwy Approach looking W
09/16/2009
RAILROAD CROSSING
TRACKS


479854T-09162009-08.jpg - - N Side of Xing;Xing Surface looking S
09/16/2009


479854T-09162009-09.jpg - - N Looking S Track 2
09/16/2009

Appendix L – Bowman / NS Crossing Photos


479856G-09162009-02.jpg - - N Side of Xing;Hwy Approach looking S
09/16/2009


479856G-09162009-07.jpg - - S Side of Xing;Hwy Approach looking N
09/16/2009


479856G-09162009-08.jpg - - W Side of Xing;Xing Surface looking E
09/16/2009


479856G-09162009-09.jpg - - W Looking E Track 2
09/16/2009

Appendix M – Williams/NS Crossing Photos


479859C-09292009-01.jpg - - Xing Number
NS
NORFOLK SOUTHERN
TO REPORT
CROSSING SIGNAL MALFUNCTION
CALL 1-800-946-4744
REFER TO CROSSING
LOCATED AT
479-859C
WILLIAMS ST
09/29/2009 06:54


479859C-09292009-02.jpg - - E Side of Xing;Hwy Approach looking W
RAIL ROAD CROSSING
09/29/2009 06:58


479859C-09292009-03.jpg - - E Side of Xing;Down-the-Track looking S
09/29/2009 06:58


479859C-09292009-04.jpg - - E Side of Xing;Down-the-Track looking N
09/29/2009 06:58


479859C-09292009-05.jpg - - W Side of Xing;Down-the-Track looking N
09/29/2009 06:59


479859C-09292009-06.jpg - - W Side of Xing;Down-the-Track looking S
09/29/2009 07:00


479859C-09292009-07.jpg - - W Side of Xing;Hwy Approach looking E
RAIL
CROSSING
TRACKS
Depke
09/29/2009 07:01

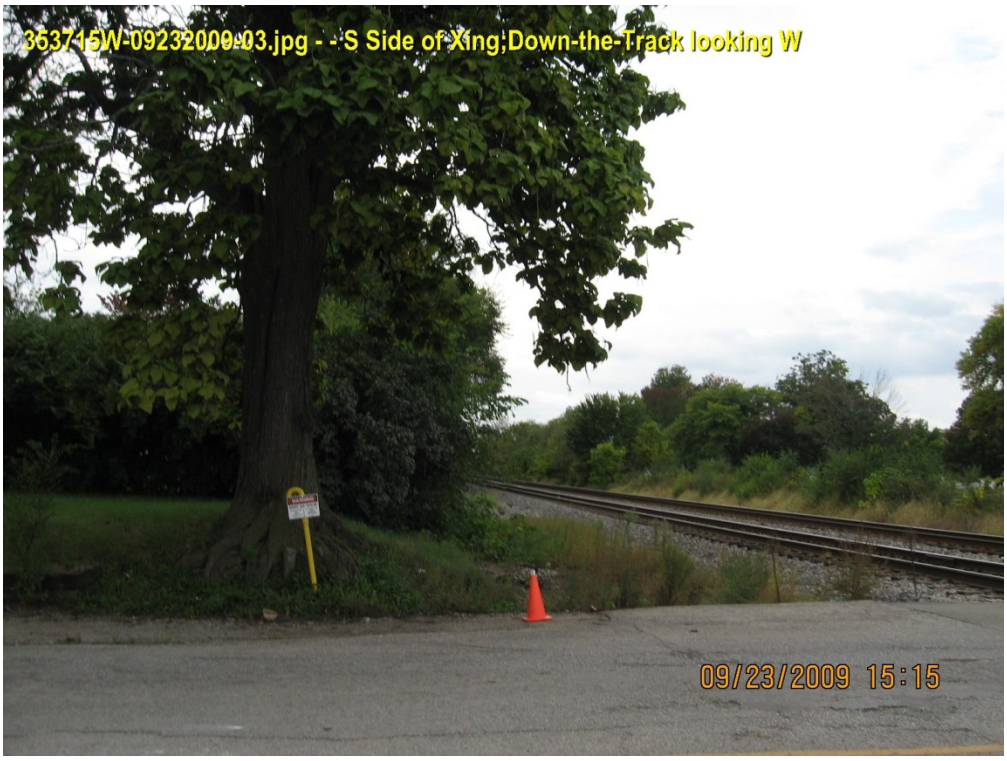

479859C-09292009-08.jpg - - S Side of Xing;Xing Surface looking N
09/29/2009 06:59


479859C-09292009-10.jpg - - S LOOKING N TRACK #3.
09/29/2009 06:58

Appendix N – Griffin / CSX Crossing Photos


353715W-09232009-01.jpg - - Xing Number
GRIFFIN ST.
353715W
09/23/2009 15:12


353715W-09232009-02.jpg - - S Side of Xing;Hwy Approach looking N
09/23/2009 15:15


353715W-09232009-03.jpg - - S Side of Xing;Down-the-Track looking W
09/23/2009 15:15


353715W-09232009-04.jpg - - S Side of Xing;Down-the-Track looking E
09/23/2009 15:15

353715W-09232009-05.jpg - - N Side of Xing;Down-the-Track looking E

353715W-09232009-06.jpg - - N Side of Xing;Down-the-Track looking W


353715W-09232009-07.jpg - - N Side of Xing;Hwy Approach looking S
09/23/2009 15:17


353715W-09232009-08.jpg - - W Side of Xing;Xing Surface looking E
09/23/2009 15:15


353715W-09232009-09.jpg - - W LOOKING E TRACK #2.
09/23/2009 15:15