IOWA DOT
I-80 Planning Study

INTERSTATE 80
PLANNING STUDY (PEL)

Evaluation of Overhead Structures

Office of Location and Environment | May 2016

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1. INTRODUCTION

As part of a Planning and Environmental Linkage (PEL) study for the I-80 Interstate system, an evaluation was performed to assess the need to replace grade separated structures carrying rural county roads over Interstate 80 and vice versa. This memorandum includes a description of the methodologies used to evaluate the existing structures, results of the evaluation, and recommendations as to which structures serve more of a critical need and should be replaced and which serve more of a need based on convenience and perhaps should not be replaced with future construction.

Reconstructing the Interstate system will require reconstructing overhead structures to accommodate additional lanes needed to increase capacity or lanes needed to stage traffic during reconstruction of the system. An overhead structure is used to separate the grades of two intersecting roadways or a roadway and a railroad. Overhead structures provide the ability to accommodate high volumes of traffic to cross safely and efficiently through an intersection. However, the high cost of constructing an overhead structure should be limited to cases where the additional cost can be justified. Specific conditions or warrants justifying overhead structure are difficult to develop and in some instances cannot be conclusively stated, because of the wide variety of site conditions.

Iowa Department of Transportation Policy 500.4 states, “It is the policy of the Iowa Department of Transportation to secure permanent closure of existing local (non-primary) roads/streets when in the judgment of the Department it is in the best public interests to close these roads/streets”. This evaluation will provide the Department the foundation to decide which overhead structures give the best value and use out of the system we have.

Existing overhead structures on the interstate system connect with the local or county road network. Most of the local road network in rural Iowa is a grid system with the local roads spaced at 1 mile increments. The grid system creates several alternative travel paths for trips. In other words; the local road grid system provides alternate routes to cross the interstate without adding an unreasonable out of distance to a trip.

The most basic measure of the traffic demand for a roadway is the average daily traffic (ADT) volume. The ADT for most roads is measured frequently to show roadway usage. Local roads in some parts of the rural area are used by a small percentage of the population and have a very low ADT. The rural population is decreasing as more people are migrating towards counties containing metro areas. Population changes from the rural to metro area will lower the ADT on some rural roadways resulting less usage and need for some of the overhead structures.

Other considerations for replacing overhead structures not analyzed with this evaluation but need to be considered are the Interstate System is used to move both military and civilian equipment, freight, and personal traffic over long distances between and within states. An overhead structure can be a vertical or horizontal restriction for large vehicles used for military equipment or commercial freight. Overhead structures have fixed objects and steep slopes within the roadside environment that are a roadside hazard. Eliminating roadside hazards

provides a roadside environment free of fixed objects enhancing the opportunity for a motorist to regain control of their vehicle and reduce the severity of a crash, making the roadside safer. It is not only in the state's interest but in national interest to preserve and enhance the Interstate System to meet the needs of the 21st century by assuring it provides the highest level of service in terms of safety and mobility.

It is the intention of this memorandum to begin the conversation with local officials as to which structures are critical to local travel needs within the county road system and determine the value the structure brings to the system. The State and County will need an agreement to come to terms about not replacing a bridge or to determine the local cost-share of replacing a bridge that serves local needs.

2. METHODOLOGY

The IaDOT is responsible to maintain, preserve, and improve transportation infrastructure assets with a finite budget. A proactive approach to manage our infrastructure assets is to evaluate the existing system and determine which assets are critical to local and regional access and connectivity. Overhead structures are an infrastructure asset. Because funding is not available to replace every overhead structure, the team determined the need to replace an overhead structure is to be based upon the usage of the roadway and inconvenience of out of distance travel. Road user costs and ADT were used to determine the road usage needed pay for the replacement cost of a structure.

3. CRITERIA

Criteria for evaluating overhead bridges were established through discussions with the Iowa Department of Transportation Highway Division Management Team (HDMT). The Highway Division Management Team are District Engineers, and Office Directors for the Project Delivery and System Operation offices; as well as, the Highway Division Director.

Bridges within urbanized areas, bridges associated with an existing interchange, and bridges for local roads with an existing ADT more than 1000 vehicles per day were excluded from this evaluation.

Overhead structures between the Interstate and Railroads were also excluded with this evaluation, but the department encourages discussions with owners of rail lines for projects that include crossings between the interstate and rail lines.

The following criteria were used to evaluate the remaining structures:

Average Daily Traffic (ADT) – The average of 24-hour counts collected over a number of days greater than 1 but less than a year. In other words, ADT is the average number of vehicles that use a roadway on a daily basis. The ADT listed in the following tables are for the local or county road that crosses the Interstate.

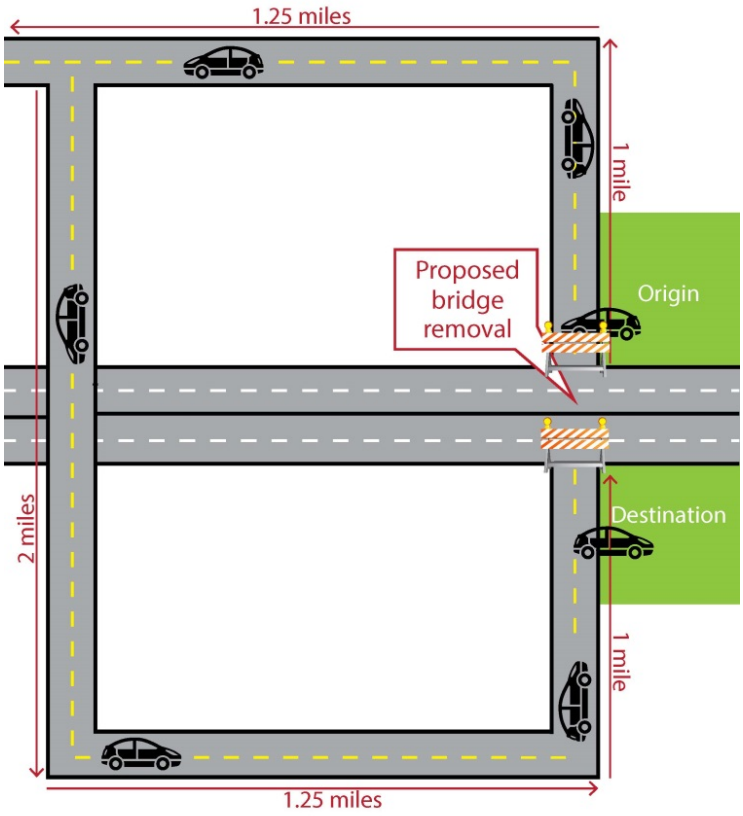
The IaDOT Office of Systems Planning provided average daily traffic volumes.

Maximum out of distance travel –This criterion was used to measure the additional distance a property owner on one side of the interstate near an overhead structure would need to travel to properties they may own or need to access on the other side of the Interstate if an overhead structure nearest their property were removed. The property owner would then be forced to use the next nearest Interstate crossing.

Maintenance of Level B service roads are usually a minimum effort to keep the road open to traffic; therefore, Level B service roads were not included as viable alternate route.

For example, Figure 1 shows the maximum out of distance traveled from Point A to Point B as 6.5 miles.

Figure 1. EXAMPLE OF CALCULATING THE MAXIMUM OUT DISTANCE TRAVELED

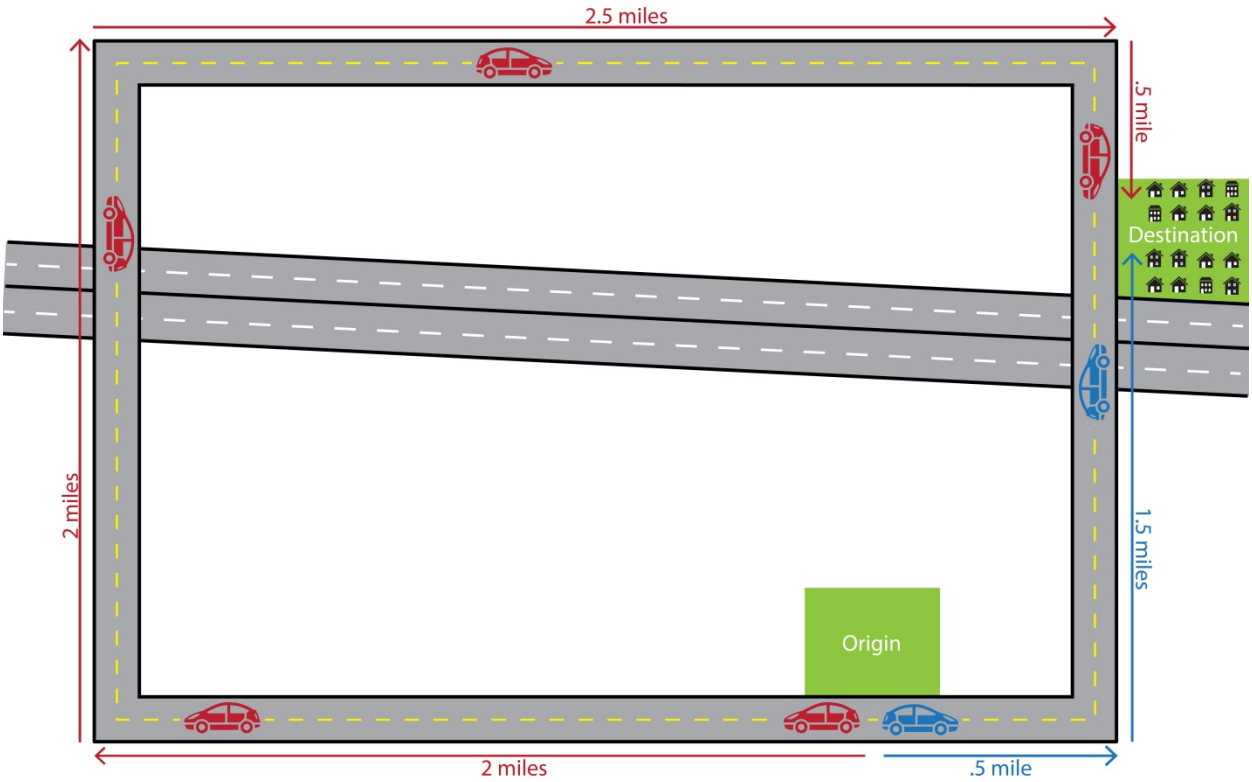


Minimum out of distance travel –This criterion was used to assess how much additional travel would be required to the most likely destination or common point in the area of the structure. This destination was usually the nearest town or interchange and the origins were each side of the bridge. If a structure was removed this measure would evaluate the additional distance that would be required to reach this destination or common point by drivers on the opposite side of the interstate. The driver would be required to use the next nearest Interstate crossing to reach the destination or common point.

Maintenance of Level B service roads are usually a minimum effort to keep the road open to traffic; therefore, Level B service roads were not included as viable alternate route.

As shown in Figure 2, the minimum out of distance traveled between Point A and the town would be 5 miles.

Figure 2. EXAMPLE OF CALCULATING THE MINIMUM OUT DISTANCE TRAVELED



4. SCORING PROCESS

To assist with the evaluation process, the study team assigned each of the evaluation criteria a score. The scoring system provided a method to measure the potential hardship to users of the local roadway network if the crossing was eliminated. This provided the study team a listing of bridges that are a high priority for replacement and which bridges were not.

The scoring system ranged from 1 to 5 in terms of priority.

1 – Highest priority to replace: The crossing is needed for regional access and connectivity and may cause hardship to the local travel if it is eliminated.

2 – Moderate priority to replace: There is a moderate need for the crossing for regional access and connectivity and may cause moderate hardship to local travel if it is eliminated.

3 – Average priority to replace: There is an average need for the crossing for regional access and connectivity and elimination may cause some hardship to local travel if it is eliminated.

4 – Low priority to replace: The crossing will likely cause only minor hardship to access and connectivity if it is eliminated.

5 – Lowest priority to replace: The crossing is only for localized traffic needs and hardship is limited.

The percentiles and corresponding score are given in Table 1. The percentile distribution reflects the k-th percentile of values in range. For example, 90% of the values lie at or below the ninetieth percentile, and ten percent above it.

Table 1. SCORE PERCENTILE

Score	Percentile
5	20th
4	40th
3	60th
2	80th
1	100th

The following are the scores and ranges for the evaluation reflected by the percentile distribution:

Average Daily Traffic (ADT)	Maximum Out of Distance Travel	Minimum Out of Distance Travel
1 – Over 140	1 – Over 8.40 miles	1 – Over 1.88 miles
2 – 99 to 140	2 – 6.88 to 8.40 miles	2 – 1.11 to 1.88 miles
3 – 61 to 98	3 – 6.01 to 6.87 miles	3 – 0.83 to 1.10 miles
4 – 44 to 60	4 – 5.11 to 6.00 miles	4 – 0.29 to 0.82 miles
5 – Under 43	5 – Under 5.10 miles	5 – Under 0.28 miles

Each bridge was scored individually for these three criteria. The average score of the three criteria were then used to determine the final score or priority to replace.

5. ANALYSIS AND RESULTS

Sixty-four (64) overhead structures along interstate 80 throughout the state were analyzed as part of this study. The specific structures analyzed are listed in Table 3-1. The overhead structures are listed in order from the western side of Iowa to the eastern side along Interstate 80.

Table 2. OVERHEAD STRUCTURES ANALYZED

No.	District	County	Interstate 80 or County Road Overhead Structure	Milepost	County Road	Approximate ODT Min	Approximate ODT Max	County Road ADT
1	4	Pottawattamie	COUNTY ROAD	11.7	Hanie Ave	0.7	5.1	170
2	4	Pottawattamie	INTERSTATE 80	13.1	Idlewood Road	1.5	5.1	120
3	4	Pottawattamie	INTERSTATE 80	13.1	Idlewood Road	1.5	5.1	120
4	4	Pottawattamie	COUNTY ROAD	15.2	Juniper Road	1.3	6.1	170
5	4	Pottawattamie	INTERSTATE 80	18.8	Mahogany Road	6.7	8.2	110
6	4	Pottawattamie	INTERSTATE 80	18.8	Mahogany Road	6.7	8.2	110
7	4	Pottawattamie	COUNTY ROAD	22.0	290th Street	1	7.4	40
8	4	Pottawattamie	COUNTY ROAD	32.8	370th Street	4.5	8.4	30
9	4	Pottawattamie	COUNTY ROAD	36.8	410th Street	2.5	10	60
10	4	Pottawattamie	INTERSTATE 80	42.7	470th Street	0.5	6	50
11	4	Pottawattamie	INTERSTATE 80	42.7	470th Street	0.5	6	50
12	4	Pottawattamie	COUNTY ROAD	44.7	490th Street	1.1	6	60
13	4	Pottawattamie	COUNTY ROAD	48.7	530th Street	1	7.7	50
14	4	Cass	COUNTY ROAD	52.6	570th Street	0	3.9	15
15	4	Cass	COUNTY ROAD	52.6	570th Street	0	4	15
16	4	Cass	INTERSTATE 80	56.6	Buck Creek Road	1.75	6	60
17	4	Cass	INTERSTATE 80	56.6	Buck Creek Road	1.75	6	60
18	4	Cass	COUNTY ROAD	62.4	670th Street	4.4	8.6	70
19	4	Cass	COUNTY ROAD	66.3	710th Street	1	6.6	40
20	4	Cass	COUNTY ROAD	69.3	740th Street	0.5	5.1	140
21	4	Cass	INTERSTATE 80	72.1	770th Street	0	8.4	15
22	4	Cass	INTERSTATE 80	72.2	770th Street	0	8.4	15
23	4	Adair	COUNTY ROAD	79.4	Gibbon Avenue	0.75	6	25

24	4	Adair	COUNTY ROAD	80.4	Fontanelle Road	0.1	6	80
25	4	Adair	COUNTY ROAD	90.3	Riverside Avenue	1.5	5.9	60
26	4	Adair	COUNTY ROAD	92.3	Trenton Avenue	1.3	4.5	110
27	4	Adair	COUNTY ROAD	96.2	York Avenue	1	4	40
28	4	Madison	COUNTY ROAD	96.2	Creamery Road	2	4.75	60
29	4	Dallas	COUNTY ROAD	99.5	Durango Way	1.8	4.5	120
30	4	Dallas	COUNTY ROAD	108.9	347th Street	2.9	5.7	100
31	4	Dallas	COUNTY ROAD	112.2	Old Portland Road	0.3	10.9	120
32	4	Dallas	COUNTY ROAD	114.5	S Avenue	2.5	7.3	90
33	1	Polk	COUNTY ROAD	144.9	NE 62nd Street	0.9	7	430
34	1	Polk	COUNTY ROAD	146.9	NE 96th Street	0.3	6	250
35	1	Jasper	INTERSTATE 80	149.9	NE 120th Street	0.3	4.2	10
36	1	Jasper	INTERSTATE 80	149.9	NE 120th Street	0.3	4.2	10
37	1	Jasper	COUNTY ROAD	152.4	West 128th Street	0.1	6.9	120
38	1	Jasper	COUNTY ROAD	161	West 62nd Street	0.25	6.7	280
39	1	Jasper	COUNTY ROAD	162.3	West 52nd Street	1.1	6.9	50
40	1	Jasper	COUNTY ROAD	171.3	East 84th Street	0.2	6	140
41	1	Jasper	COUNTY ROAD	174.5	12th Avenue E	1.1	4.1	35
42	1	Poweshiek	INTERSTATE 80	184.7	50th Street	2.3	8.5	80
43	1	Poweshiek	INTERSTATE 80	184.7	50th Street	2.3	8.5	80
44	1	Poweshiek	COUNTY ROAD	187.7	County Road T58	0.25	5.2	210
45	1	Poweshiek	COUNTY ROAD	189.9	100th Street	0.5	6.5	130
46	1	Poweshiek	COUNTY ROAD	194.2	145th Street	0	7	45
47	1	Poweshiek	COUNTY ROAD	199.8	200th Street	2.7	8.8	50
48	1	Poweshiek	COUNTY ROAD	203.8	240th Street	0.25	6	70
49	6	Iowa	COUNTY ROAD	207.8	D Avenue	0	6	60
50	6	Iowa	COUNTY ROAD	213.9	J Avenue	1	10.2	50

51	6	Iowa	COUNTY ROAD	221.9	R Avenue	0.5	8	140
52	6	Iowa	COUNTY ROAD	228	Y Avenue	1	8.7	80
53	6	Johnson	COUNTY ROAD	233	Eagle Avenue NW	1.5	8	190
54	6	Johnson	COUNTY ROAD	236.4	Half Moon Avenue	1.5	5.6	200
55	6	Johnson	COUNTY ROAD	250.6	Wapsi Avenue SE	1.5	5.1	210
56	6	Johnson	COUNTY ROAD	252.9	Lower West Branch Road	1	6	100
57	6	Cedar	COUNTY ROAD	256.7	Delta Avenue	0.25	6	250
58	6	Cedar	COUNTY ROAD	262	Inca Avenue	0.8	6.5	35
59	6	Cedar	COUNTY ROAD	268.9	Pine Road	0.8	8.8	90
60	6	Cedar	COUNTY ROAD	273.1	Taylor Avenue	1	9	570
61	6	Cedar	COUNTY ROAD	275.1	Vermont Avenue	1	7	50
62	6	Scott	COUNTY ROAD	278.1	Scott Cedar Road	1	5	80
63	6	Scott	COUNTY ROAD	282.6	220th Street	2.5	6.75	60
64	6	Scott	COUNTY ROAD	286.5	80th Avenue	2	10	150

6. ANALYSIS

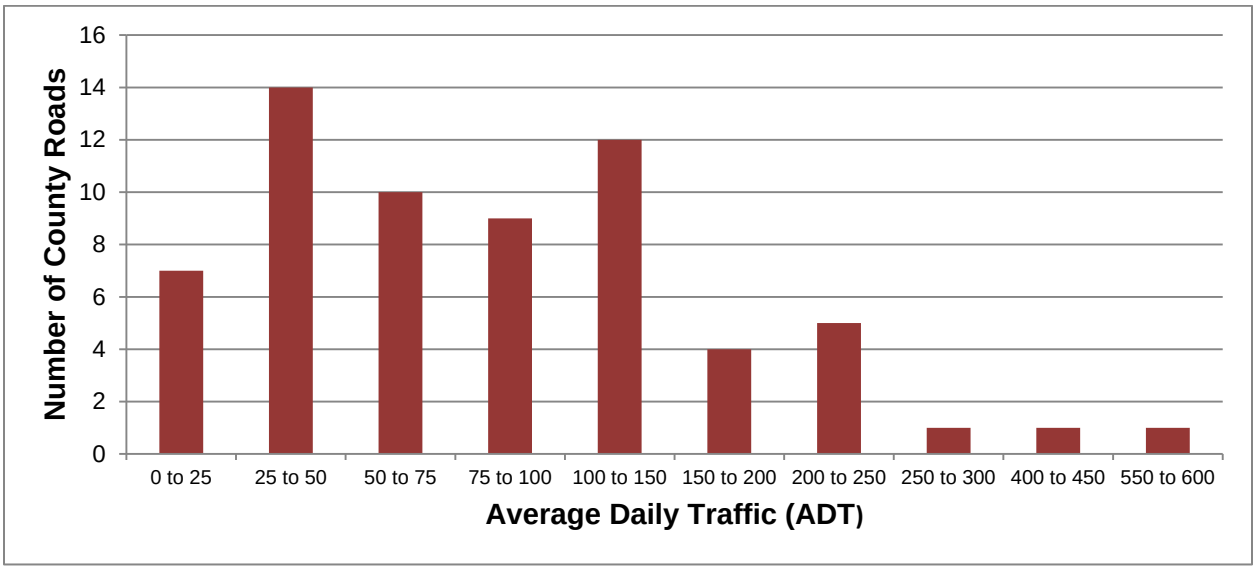
Average Daily Traffic

Figure 3 is a graph showing number of county roads with an existing ADT for the ranges shown. The figure puts frequency and ADT in perspective; about 1/3 of the overhead structures analyzed are for county roads with a usage of less than 50 vehicles per day.
See table 3 for statistics that were calculated from the data.

Table 3. AVERAGE DAILY TRAFFIC STATISTICS

Minimum ADT	Maximum ADT	Average ADT	Median ADT
10	570	104	80

Figure 3. COUNTY ROAD AVERAGE DAILY TRAFFIC



Iowa's State Transportation Plan (Iowa in Motion – Planning Ahead) shows Iowa's population has been migrating towards the states nine metropolitan areas and counties that contain or are adjacent to those metro areas. Assuming this trend continues, the plan highlighted that trend that Iowa's metropolitan area will account for 60 percent of the state's total population by 2040. This trend will consequently continue to decrease the volume of traffic using the rural county road network.

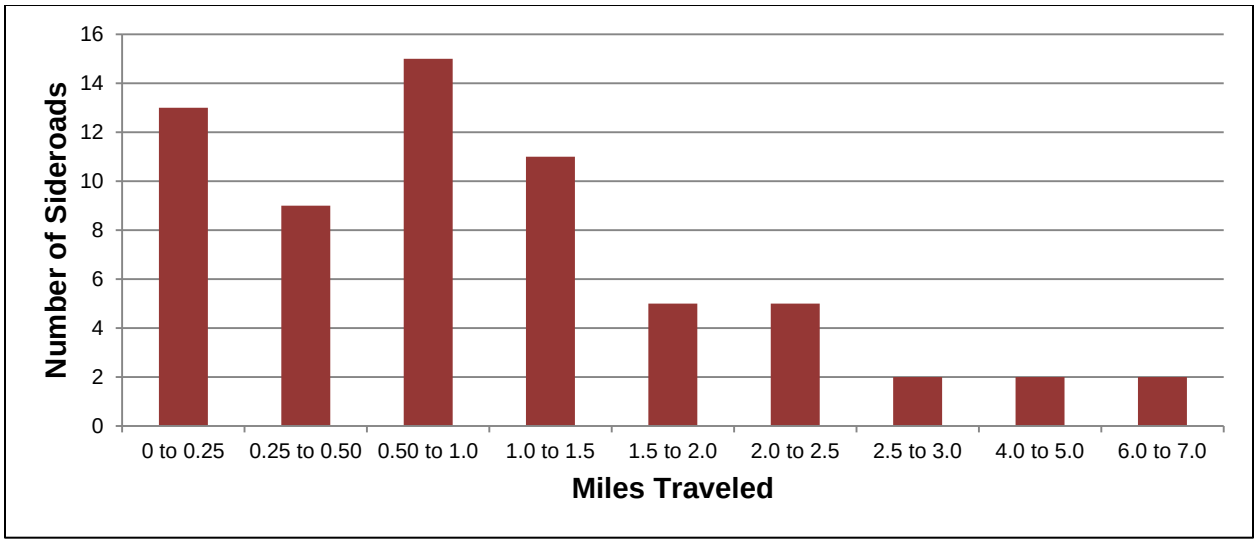
7. MINIMUM OUT OF DISTANCE TRAVEL

Figure 4 illustrates the distribution of the number of county roads with a minimum out of distance travel for the ranges shown. The figure puts frequency and minimum out of distance travel in perspective; about 1/3 of the overhead structures analyzed are for county roads with a minimum out distance traveled of less than 0.50 miles. See table 4 for statistics that were calculated from the data.

Table 4. MINIMUM OUT OF DISTANCE TRAVEL STATISTICS

Minimum (miles)	Maximum (miles)	Average (miles)	Median (miles)
0.00	6.70	1.30	1.00

Figure 4. MINIMUM OUT OF DISTANCE TRAVL



The minimum out of distance travel was determined used the existing county road grid system in the area, but did not use Level B service roads as an option.

The analysis of available alternative routes showed upgrading Level B service roads or constructing parallel routes to the Interstate could reduce the out of distance traveled for some locations. This evaluation did not study whether upgrading the Level B would be economically viable, but this should be considered in further studies.

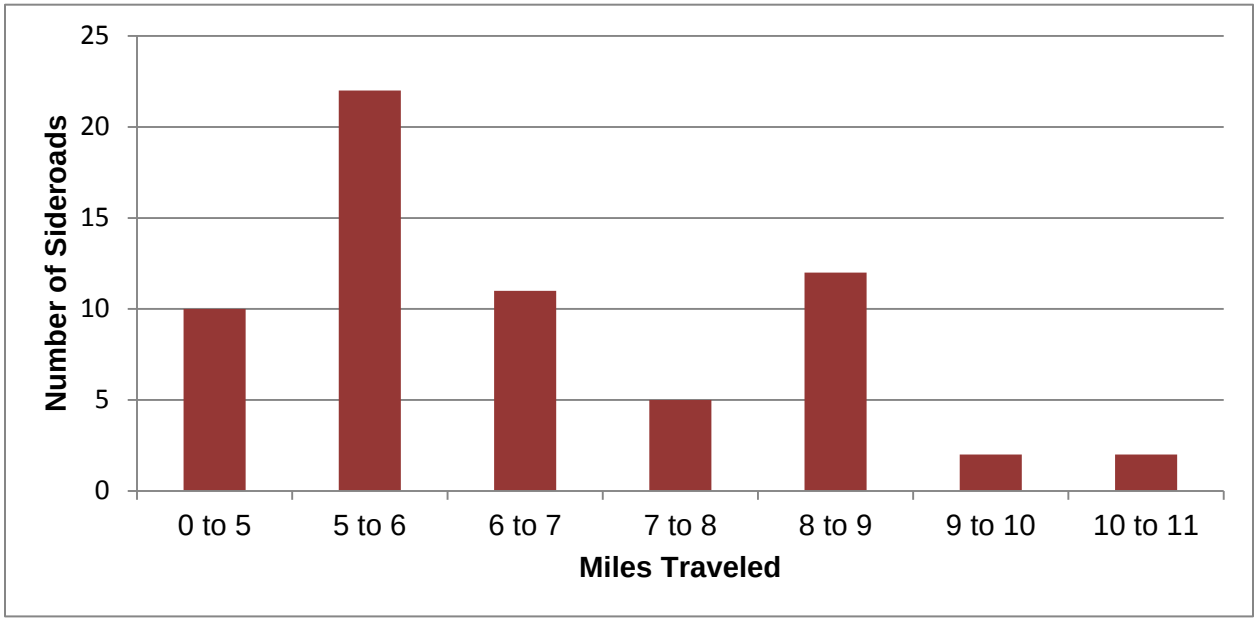
8. MAXIMUM OUT DISTANCT TRAVEL

Figure 5 illustrates the distribution of the number of county roads with a maximum out of distance travel for the ranges shown. The figure puts frequency and minimum out of distance travel in perspective; about 1/3 of the overhead structures analyzed are for county roads with a maximum out distance traveled of less than 6.0 miles. See table 5 for statistics that were calculated from the data.

Table 5. MAXIMUM OUT DISTANCE TRAVEL

Minimum (miles)	Maximum (miles)	Average (miles)	Median miles)
3.90	10.90	6.64	6.05

Figure 5. MAXIMUM OUT OF DISTANCE TRAVEL



9. RESULTS

Results from the analysis are shown in Table 6. The result show the final or average replacement priority based upon ADT, and minimum and maximum out of distance travel. Structures highlighted in yellow are a low to lowest priority to replace.

Table 6. REPLACEMENT PRIORITY FOR OVERHEAD STRUCTURES

No.	Final Replacement Priority	District	County	Milepost	Local Road	Approximate ODT Min (miles)	ODT Min Priority	Approximate ODT Max (miles)	ODT Max Priority	County Road ADT	ADT Priority
1	3	4	Pottawattamie	11.7	Hanie Ave	0.7	4	5.1	5	170	1
2	3	4	Pottawattamie	13.1	Idlewood Road	1.5	2	5.1	5	120	2
3	3	4	Pottawattamie	13.1	Idlewood Road	1.5	2	5.1	5	120	2
4	2	4	Pottawattamie	15.2	Juniper Road	1.3	2	6.1	3	170	1
5	2	4	Pottawattamie	18.8	Mahogany Road	6.7	1	8.2	2	110	2
6	2	4	Pottawattamie	18.8	Mahogany Road	6.7	1	8.2	2	110	2
7	3	4	Pottawattamie	22	290th Street	1	3	7.4	2	40	5
8	3	4	Pottawattamie	32.8	370th Street	4.5	1	8.4	2	30	5
9	2	4	Pottawattamie	36.8	410th Street	2.5	1	10	1	60	4
10	4	4	Pottawattamie	42.7	470th Street	0.5	4	6	4	50	4
11	4	4	Pottawattamie	42.7	470th Street	0.5	4	6	4	50	4
12	4	4	Pottawattamie	44.7	490th Street	1.1	3	6	4	60	4
13	3	4	Pottawattamie	48.7	530th Street	1	3	7.7	2	50	4
14	5	4	Cass	52.6	570th Street	0	5	3.9	5	15	5
15	5	4	Cass	52.6	570th Street	0	5	4	5	15	5
16	3	4	Cass	56.6	Buck Creek Road	1.75	2	6	4	60	4
17	3	4	Cass	56.6	Buck Creek Road	1.75	2	6	4	60	4
18	2	4	Cass	62.4	670th Street	4.4	1	8.6	1	70	3
19	4	4	Cass	66.3	710th Street	1	3	6.6	3	40	5

20	4	4	Cass	69.3	740th Street	0.5	4	5.1	5	140	2
21	4	4	Cass	72.1	770th Street	0	5	8.4	2	15	5
22	4	4	Cass	72.2	770th Street	0	5	8.4	2	15	5
23	4	4	Adair	79.4	Gibbon Avenue	0.75	4	6	4	25	5
24	4	4	Adair	80.4	Fontanelle Road	0.1	5	6	4	80	3
25	3	4	Adair	90.3	Riverside Avenue	1.5	2	5.9	4	60	4
26	3	4	Adair	92.3	Trenton Avenue	1.3	2	4.5	5	110	2
27	4	4	Adair	96.2	York Avenue	1	3	4	5	40	5
28	3	4	Madison	96.2	Creamery Road	2	1	4.75	5	60	4
29	3	4	Dallas	99.5	Durango Way	1.8	2	4.5	5	120	2
30	2	4	Dallas	108.9	347th Street	2.9	1	5.7	4	100	2
31	2	4	Dallas	112.2	Old Portland Road	0.3	4	10.9	1	120	2
32	2	4	Dallas	114.5	S Avenue	2.5	1	7.3	2	90	3
33	2	1	Polk	144.9	NE 62nd Street	0.9	3	7	2	430	1
34	3	1	Polk	146.9	NE 96th Street	0.3	4	6	4	250	1
35	5	1	Jasper	149.9	NE 120th Street	0.3	4	4.2	5	10	5
36	5	1	Jasper	149.9	NE 120th Street	0.3	4	4.2	5	10	5
37	3	1	Jasper	152.4	West 128th Street	0.1	5	6.9	2	120	2
38	3	1	Jasper	161	West 62nd Street	0.25	5	6.7	3	280	1
39	3	1	Jasper	162.3	West 52nd Street	1.1	3	6.9	2	50	4
40	4	1	Jasper	171.3	East 84th Street	0.2	5	6	4	140	2
41	4	1	Jasper	174.5	12th Avenue E	1.1	3	4.1	5	35	5
42	2	1	Poweshiek	184.7	50th Street	2.3	1	8.5	1	80	3
43	2	1	Poweshiek	184.7	50th Street	2.3	1	8.5	1	80	3
44	3	1	Poweshiek	187.7	County Road T58	0.25	5	5.2	4	210	1
45	3	1	Poweshiek	189.9	100th Street	0.5	4	6.5	3	130	2
46	4	1	Poweshiek	194.2	145th Street	0	5	7	2	45	4

47	2	1	Poweshiek	199.8	200th Street	2.7	1	8.8	1	50	4
48	4	1	Poweshiek	203.8	240th Street	0.25	5	6	4	70	3
49	4	6	Poweshiek	207.8	D Avenue	0	5	6	4	60	4
50	3	6	Iowa	213.9	J Avenue	1	3	10.2	1	50	4
51	3	6	Iowa	221.9	R Avenue	0.5	4	8	2	140	2
52	2	6	Iowa	228	Y Avenue	1	3	8.7	1	80	3
53	2	6	Johnson	233	Eagle Avenue NW	1.5	2	8	2	190	1
54	2	6	Johnson	236.4	Half Moon Avenue	1.5	2	5.6	4	200	1
55	3	6	Johnson	250.6	Wapsi Avenue SE	1.5	2	5.1	5	210	1
56	3	6	Johnson	252.9	Lower West Branch Road	1	3	6	4	100	2
57	3	6	Cedar	256.7	Delta Avenue	0.25	5	6	4	250	1
58	4	6	Cedar	262	Inca Avenue	0.8	4	6.5	3	35	5
59	3	6	Cedar	268.9	Pine Road	0.8	4	8.8	1	90	3
60	2	6	Cedar	273.1	Taylor Avenue	1	3	9	1	570	1
61	3	6	Cedar	275.1	Vermont Avenue	1	3	7	2	50	4
62	4	6	Scott	278.1	Scott Cedar Road	1	3	5	5	80	3
63	3	6	Scott	282.6	220th Street	2.5	1	6.75	3	60	4
64	1	6	Scott	286.5	80th Avenue	2	1	10	1	150	1

Table 1. REPLACEMENT PRIORITY AND NUMBER STRUCTURES

Replacement Priority	Number of Overhead Structures	
1	1	Highest to moderate priority to replace. These structures will cause local hardship if the structures are eliminated from the system
2	16	
3	26	Average priority to replace. Some local hardship if the structures are eliminated from the system.
4	17	Low to lowest priority to replace. These are for localized needs and hardship will be limited if they are eliminated from the system.
5	4	

10. COST

A cost analysis was done to determine how many users of a road were needed to recover the cost of replacing a bridge.

Bridge Replacement Cost

Below are cost estimates to replace a typical overhead structure.

- County road over Interstate 80:
  - 6-lanes on Interstate 80 $1.3 million
- Interstate 80 over county road:
  - 6-lanes on Interstate 80 $1.9 million

These estimates only include the cost of the bridge. Pavement, earthwork, and other construction materials, additional right-of-way, relocating utilities, and the complexity to manage traffic to reconstruct the bridge are costs associated with each specific bridge. However, the cost of the bridge can be used as a minimum cost approach and serve as a basis to determine a user cost comparison.

User Cost

The major state funding source for the construction and maintenance of bridges is the Road Use Tax Fund (RUTF). The per-user RUTF contribution for a licensed driver in Iowa is approximately $700 annually.

Local residents primarily use low volume county roads. Assuming the residents make a home-to-work trip and then a work-to-home trip on a daily basis, the average daily traffic for local road can be used to determine the number of users for a local road. For example, a local road with 60 ADT would equate to 30 users assuming the user makes one trip a day.

The planned service life for a newly constructed bridge is 75 years or greater. Table 8 shows number users and county road ADT needed to recover the cost to replace a county road or Interstate 80 overhead structure.

Table 8. BRIDGE REPLACEMENT COST

Bridge replacement cost ($)	Bridge life (years)	Average user cost ($)	Number of users	ADT (vpd)
$1,300,000	75	700	25	50
$1,900,000	75	700	37	74

The analysis shows a county road over the Interstate with less than 50 vehicles per day may not recover the cost to replace a bridge over its planned service life. 74 vehicles per day are needed to replace Interstate bridges over a county road. The analysis did not consider annual maintenance costs or the additional material and right-of-way needed to replace a bridge. These other costs would increase the cost of a bridge and show more road users are needed to recover the cost to replace the bridge.

11. CONCLUSION

The analysis showed about 1/3 of the overhead structures meeting the evaluation criteria seem to serve more of a convenience for local travel needs rather than access and connectivity needs of the statewide system.

- The following summarizes several assumptions, expectations, and findings of this analysis:
- Iowa's population is continuing to migrate toward the state's metropolitan areas.
- Iowa's metropolitan population is expected to account for nearly 60 percent of the state's total population by 2040.
- Increased population in metropolitan areas will likely continue to create congestion and capacity issues the state will need address with improvements to the existing systems within metropolitan areas.
- 31 of the 64 overhead structures analyzed currently have an existing ADT less than 50.
- 37 of the 64 overhead structures analyzed would have minimum out of distance travel of less than 1 mile.
- 43 of the 64 overhead structures analyzed would have a maximum out of distance travel of less than 7 miles.
- County roads with an ADT greater than 50 are needed to recover the cost to replace a county road bridge over the Interstate.
- County roads with an ADT greater than 74 are needed to recover the cost to replace an Interstate bridge over a county road.

12. RECOMMENDATIONS

- Overhead structures with a replacement score of 1 or 2 are high priority to the statewide system. These structures should be replaced as improvements to Interstate 80 are made.
- Overhead structures with an average replacement scoring of 3 are of moderate need to serve statewide connectivity and access needs. It is understood that local needs sometimes reflect different priorities than statewide goals or needs. Structures with this priority scoring should be considered for replacement should local jurisdictions voice that a particular structure is a priority need and also agree to fund a portion of the replacement costs.
- Overhead structures with a replacement scoring of 4 or 5 are a low priority to replace. These structures should not be replaced unless there is cost-sharing agreement between the State and County.

- As future improvements to Interstate 80 are considered and evaluated, the analysis within this memorandum should be used to begin discussions with locals about replacing the structures and/or sharing the cost replace it.

Table 9 is a list the structures and the respective priority score group by priority:

Table 9. LIST OF STRUCTURES AND REPLACEMENT PRIORITY

Replacement Priority	District	County	Interstate 80 or County Road Overhead Structure	Milepost	Local Road
Lowest priority to replace					
5	4	Cass	COUNTY ROAD	52.6	570th Street
5	4	Cass	COUNTY ROAD	52.6	570th Street
5	1	Jasper	INTERSTATE 80	149.9	NE 120th Street
5	1	Jasper	INTERSTATE 80	149.9	NE 120th Street
Low priority to replace					
4	4	Pottawattamie	INTERSTATE 80	42.7	470th Street
4	4	Pottawattamie	INTERSTATE 80	42.7	470th Street
4	4	Pottawattamie	COUNTY ROAD	44.7	490th Street
4	4	Cass	COUNTY ROAD	66.3	710th Street
4	4	Cass	COUNTY ROAD	69.3	740th Street
4	4	Cass	INTERSTATE 80	72.1	770th Street
4	4	Cass	INTERSTATE 80	72.2	770th Street
4	4	Adair	COUNTY ROAD	79.4	Gibbon Avenue
4	4	Adair	COUNTY ROAD	80.4	Fontanelle Road
4	4	Adair	COUNTY ROAD	96.2	York Avenue
4	1	Jasper	COUNTY ROAD	171.3	East 84th Street
4	1	Jasper	COUNTY ROAD	174.5	12th Avenue E
4	1	Poweshiek	COUNTY ROAD	194.2	145th Street
4	1	Poweshiek	COUNTY ROAD	203.8	240th Street
4	6	Poweshiek	COUNTY ROAD	207.8	D Avenue
4	6	Cedar	COUNTY ROAD	262	Inca Avenue
4	6	Scott	COUNTY ROAD	278.1	Scott Cedar Road
Average priority to replace					
3	4	Pottawattamie	COUNTY ROAD	11.7	Hanie Ave
3	4	Pottawattamie	INTERSTATE 80	13.1	Idlewood Road
3	4	Pottawattamie	INTERSTATE 80	13.1	Idlewood Road
3	4	Pottawattamie	COUNTY ROAD	22	290th Street
3	4	Pottawattamie	COUNTY ROAD	32.8	370th Street
3	4	Pottawattamie	COUNTY ROAD	48.7	530th Street
3	4	Cass	INTERSTATE 80	56.6	Buck Creek Road

3	4	Cass	INTERSTATE 80	56.6	Buck Creek Road
3	4	Adair	COUNTY ROAD	90.3	Riverside Avenue
3	4	Adair	COUNTY ROAD	92.3	Trenton Avenue
3	4	Madison	COUNTY ROAD	96.2	Creamery Road
3	4	Dallas	COUNTY ROAD	99.5	Durango Way
3	1	Polk	COUNTY ROAD	146.9	NE 96th Street
3	1	Jasper	COUNTY ROAD	152.4	West 128th Street
3	1	Jasper	COUNTY ROAD	161	West 62nd Street
3	1	Jasper	COUNTY ROAD	162.3	West 52nd Street
3	1	Poweshiek	COUNTY ROAD	187.7	County Road T58
3	1	Poweshiek	COUNTY ROAD	189.9	100th Street
3	6	Iowa	COUNTY ROAD	213.9	J Avenue
3	6	Iowa	COUNTY ROAD	221.9	R Avenue
3	6	Johnson	COUNTY ROAD	250.6	Wapsi Avenue SE
3	6	Johnson	COUNTY ROAD	252.9	Lower West Branch Road
3	6	Cedar	COUNTY ROAD	256.7	Delta Avenue
3	6	Cedar	COUNTY ROAD	268.9	Pine Road
3	6	Cedar	COUNTY ROAD	275.1	Vermont Avenue
3	6	Scott	COUNTY ROAD	282.6	220th Street
Moderate priority to replace					
2	4	Pottawattamie	COUNTY ROAD	15.2	Juniper Road
2	4	Pottawattamie	INTERSTATE 80	18.8	Mahogany Road
2	4	Pottawattamie	INTERSTATE 80	18.8	Mahogany Road
2	4	Pottawattamie	COUNTY ROAD	36.8	410th Street
2	4	Cass	COUNTY ROAD	62.4	670th Street
2	4	Dallas	COUNTY ROAD	108.9	347th Street
2	4	Dallas	COUNTY ROAD	112.2	Old Portland Road
2	4	Dallas	COUNTY ROAD	114.5	S Avenue
2	1	Polk	COUNTY ROAD	144.9	NE 62nd Street
2	1	Poweshiek	INTERSTATE 80	184.7	50th Street
2	1	Poweshiek	INTERSTATE 80	184.7	50th Street
2	1	Poweshiek	COUNTY ROAD	199.8	200th Street
2	6	Iowa	COUNTY ROAD	228	Y Avenue
2	6	Johnson	COUNTY ROAD	233	Eagle Avenue NW
2	6	Johnson	COUNTY ROAD	236.4	Half Moon Avenue
2	6	Cedar	COUNTY ROAD	273.1	Taylor Avenue
Highest priority to replace					
1	6	Scott	COUNTY ROAD	286.5	80th Avenue

13. RESOURCES

Iowa in Motion – Planning Ahead (May 8, 2012)

http://www.iowadot.gov/iowainmotion/files/IowaInMotion_final.pdf