Chicago Metropolitan
Agency for Planning

233 S. Wacker Drive, Suite 800
Chicago, IL 60606

www.cmap.illinois.gov

Bridge Conditions In the CMAP Region

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CMAP Congestion Management Process
Author: Dan Rice

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BRIDGE CONDITIONS IN THE CMAP REGION

1 Introduction

Bridges provide important linkages that facilitate economic activity and overall regional mobility in Northeastern Illinois. As a result, the physical condition of bridges is a vital consideration for system preservation in terms of both public safety and in regards to the programming of local, state and federal funds.

The purpose of this report is to provide a description of system characteristics and an overview of bridge conditions in the CMAP region. Since CMAP does not maintain staff for regional bridge inspection, it was necessary to download Illinois state-level data from the USDOT National Bridge Inventory (NBI). CMAP staff extracted data for the CMAP region in order to develop a Microsoft Access database for analysis purposes, and to generate preliminary GIS applications.

2 The National Bridge Inventory

The National Bridge Inspection Standard (NBIS) and the associated National Bridge Inventory (NBI) was established as part of the Federal-Aid Highway Act of 1970, due in part to the national concerns raised by the 1967 collapse of the Silver Bridge that spanned the Ohio River between West Virginia and Ohio. Today, the NBI is a FHWA maintained database that contains over 90 data items for approximately 600,000 condition-rated bridges nationwide. The individual states are required to report the information which includes data such as structure type, age, geometrics, and condition ratings and appraisals for bridges over 20 feet long that carry public roadways.

The NBI is considered the world's most comprehensive database of bridge information and in particular, bridge condition ratings and deficiency status. The primary uses for the NBI database relate to the allocation of federal funding, by way of the Highway Bridge Replacement and Rehabilitation Program (HBRRP), and to provide data for the bi-annual USDOT *Conditions and Performance Reports to Congress (C&P Reports).*

The NBI is publically available as an end of the year data report, and does not serve as a "real-time" database. Some descriptive data items pertaining to design characteristics are provided in summary level. As noted by the USDOT FY2008 *Performance and Accountability Report*, as with any dynamic national database, there are always issues regarding data use, data quality and coding consistency.

The NBI is a primary source for national bridge condition for biannual *C&P Report*, which is intended to provide Congress with an objective national appraisal of the physical conditions and operational performance of highways and bridges. This report applies a similar perspective to the bridge in the CMAP region.

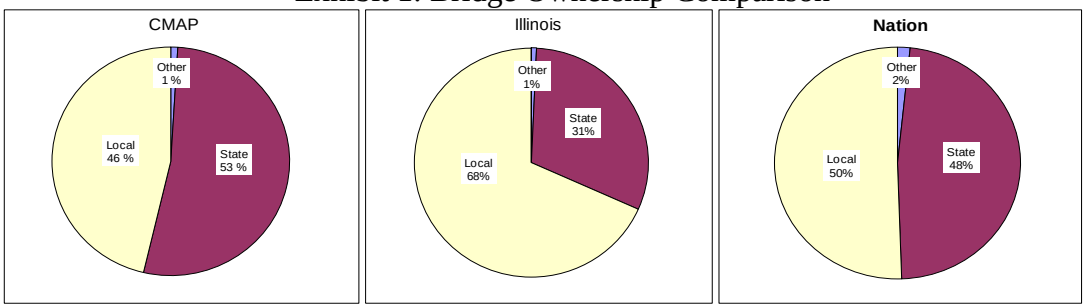
3 Regional Bridge System Characteristics

Key data items discussed in the *C&P Report* relate to bridge ownership, year built, functional class of roadway carried, and average daily traffic (ADT) carried, with a particular focus on bridges that carry National Highway System (NHS) routes.

3.1 Bridge Ownership

The bridge *owner* data field (NBI data item 22) includes almost 30 owner agency categories, which are commonly collapsed into federal, state (DOT and other state agencies), local agencies (county, township, and municipal), and other (railroad, Private, unclassified or unknown).

Exhibit 1: Bridge Ownership Comparison

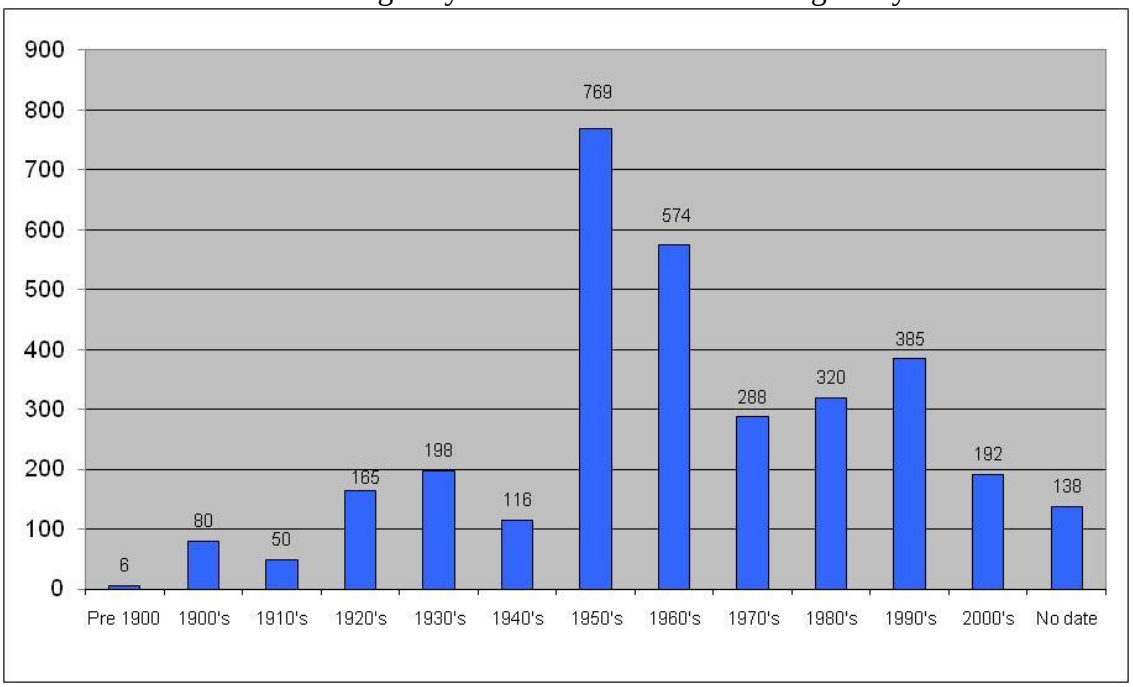


As shown in Exhibit 1, bridge ownership trends in the CMAP region more closely resembles the national ownership pattern, with an approximate 50/50 split between state and local agency ownership. Statewide, 68% of Illinois bridges are owned by local agencies while state agencies own only 31% of bridges in the state. Since the owner agency retains responsibility for bridge conditions, even in the event that a secondary agency is contracted for maintenance, it is important to note that local agencies bear substantial responsibility in both the CMAP region as well as statewide.

3.2 Age of Bridges

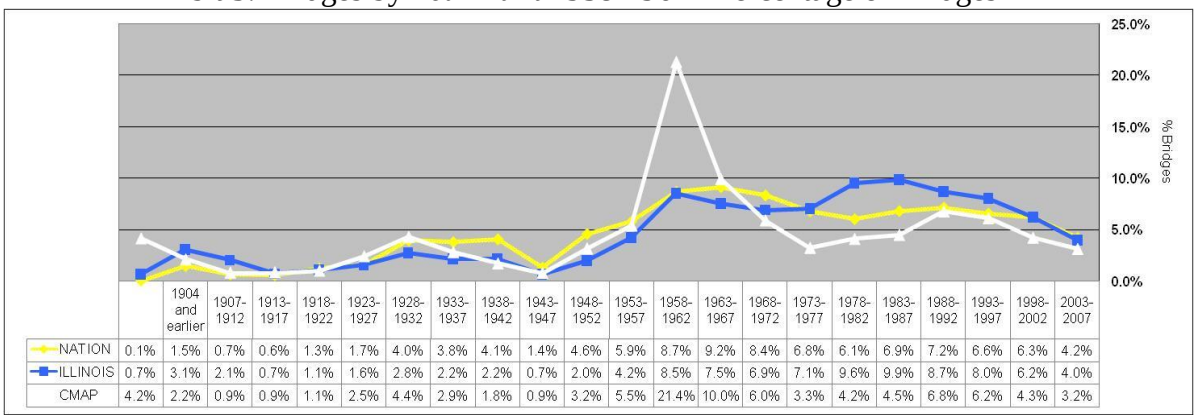
The *year built* data field (NBI data item 27) indicates the year that bridge construction was completed. The FY 2006 *C&P Report* identified 1964 as the average year built for all U.S. bridges. Based on CMAP analysis of the Illinois portion of the NBI dataset, the average year built for Illinois was 1968, and 1964 for the CMAP region. Furthermore, as illustrated in Exhibit 2, the NBI indicates that 1,343 (41%) of bridges in the CMAP region were built between 1950 and 1970.

Exhibit 2: Bridges by *Year Built* in the CMAP region by Decade



A five year breakdown of bridge construction is shown in Exhibit 3. This table indicates that 21% (700) bridges in CMAP region were completed between 1958 and 1962, which basically correlates to the bridge construction boom related to the development of Interstate Highway System. During the same period, less than 10% of national and Illinois bridges were built.

Exhibit 3: Bridges by *Year Built* 1958-1962 - Percentage of Bridges



	1904 and earlier	1907-1912	1913-1917	1918-1922	1923-1927	1928-1932	1933-1937	1938-1942	1943-1947	1948-1952	1953-1957	1958-1962	1963-1967	1968-1972	1973-1977	1978-1982	1983-1987	1988-1992	1993-1997	1998-2002	2003-2007
NATION	0.1%	1.5%	0.7%	0.6%	1.3%	1.7%	4.0%	3.8%	4.1%	1.4%	4.6%	5.9%	8.7%	9.2%	8.4%	6.8%	6.1%	6.9%	7.2%	6.6%	6.3%	4.2%
ILLINOIS	0.7%	3.1%	2.1%	0.7%	1.1%	1.6%	2.8%	2.2%	2.2%	0.7%	2.0%	4.2%	8.5%	7.5%	6.9%	7.1%	9.6%	9.9%	8.7%	8.0%	6.2%	4.0%
CMAP	4.2%	2.2%	0.9%	0.9%	1.1%	2.5%	4.4%	2.9%	1.8%	0.9%	3.2%	5.5%	21.4%	10.0%	6.0%	3.3%	4.2%	4.5%	6.8%	6.2%	4.3%	3.2%

Generally speaking, bridge deck replacement is expected once a bridge reaches 40 to 50 years of life. Between 2008 and 2012, more than one in five bridges in the CMAP region will reach the critical age of 50 years.

3.3 Functional Classification

The *functional class of inventory route* data field (NBI data item 26) indicates the functional class of the roadway carried by bridges in the NBI database. As shown in Exhibit 4, bridges that carry vital Interstate routes account for approximately 9% of

bridges across the nation and Illinois. Based on CMAP analysis of the Illinois portion of the NBI dataset, 21% of the bridges in the CMAP region carry Interstate routes, and another 41% of regional bridges carry arterial routes, many of which are on the National Highway System (NHS).

Exhibit 4: NBI Functional Class of Roadway Carried

Bridges Count by Functional System, 2007				*Bridge % by Functional System, 2007*			
Functional Classification	**Nation 2007(1)**	**Illinois 2007(1)**	**CMAP 2007(2)**	**Functional Classification**	**Nation 2007 (1)**	**Illinois 2007 (1)**	**CMAP 2007 (2)**
Interstate	56,110	2,239	690	Interstate	9.4%	8.6%	21.1%
Other Arterial	144,271	5,050	1,352	Other Arterial	24.1%	19.4%	41.3%
Collector	160,544	5,352	485	Collector	26.8%	20.6%	14.8%
Local	238,852	13,371	747	Local	39.8%	51.4%	22.8%
Total Bridges	**599,777**	**26,012**	**3,274**				

Sources: (1) FHWA summary tables, and (2) CMAP staff analysis.

Another facet of functional class involves the urban and rural classification. Rural roadways and bridges generally carry lower traffic volumes. The higher traffic volumes carried on urban roadways and bridges tend to increase the overall rate of bridge deterioration, and tend to increase the likelihood for bridges to meet the criteria for functionally obsolete classifications. As shown in Exhibit 5, more than 75% of national and Illinois bridges were classified as rural. Statewide, 77.2% of Illinois bridges carry rural roadways, while 90% of the bridges in CMAP region carry urban roadways.

Exhibit 5: Functional Class Rural/Urban Split.

Bridges Count by Functional System, 2007				*Bridge % by Functional System, 2007*			
Functional Classification	**Nation 2007(1)**	**Illinois 2007(1)**	**CMAP 2007(2)**	**Functional Classification**	**Nation 2007(1)**	**Illinois 2007(1)**	**CMAP 2007 (2)**
Rural				**Rural**			
Interstate	27,913	938	8	Interstate	4.7%	3.6%	0.2%
Other Arterial	77,190	2,352	40	Other Arterial	12.9%	9.0%	1.2%
Collector	144,847	4,539	84	Collector	24.2%	17.4%	2.6%
Local	210,644	12,244	172	Local	35.1%	47.1%	5.2%
Subtotal Rural	**460,594**	**20,073**	**304**	**Subtotal Rural**	**76.8%**	**77.2%**	**9.3%**
Urban				**Urban**			
Interstate	28,197	1,301	682	Interstate	4.7%	5.0%	20.8%
Other Arterial	67,081	2,698	1,312	Other Arterial	11.2%	10.4%	40.1%
Collector	15,697	813	401	Collector	2.6%	3.1%	12.2%
Local	28,208	1,127	575	Local	4.7%	4.3%	17.6%
Subtotal Urban	**139,183**	**5,939**	**2,970**	Subtotal Urban	**23.2%**	**22.8%**	**90.7%**
Total Bridges	**599,777**	**26,012**	**3,274**				

Sources: (1) FHWA summary tables, and (2) CMAP staff analysis.

3.4 National Highway System Bridges

The *highway system of inventory route* field (NBI data item 104) indicates bridges that carry National Highway System (NHS) routes. As shown in exhibit 6, bridges that carry NHS routes account for approximately 19% of national and 14% of Illinois bridges. Based on CMAP analysis of the Illinois portion of the NBI dataset, 36% of the bridges in the CMAP region carry NHS routes, and about half of the CMAP region's NHS bridges are Interstate routes which are also the backbone of the Department of Defense's (DoD) STRAHNET system.

Exhibit 6: Bridges that Carry NHS Routes

	NHS Bridges	All Bridges	% NHS
Nation	116,145	599,766	19.4%
Illinois	3,627	25,998	14.0%
CMAP	1,196	3,274	36.5%

The NHS consists of the Interstate system, principal arterials and intermodal connectors, and the Strategic Highway Network (STRAHNET) and its connectors. According to the FY2006 C&P Report, while the NHS makes up only 4% of total US mileage, the NHS carried more than 44% of total U.S. travel in 2004. Although approximately only 20 % of all US bridges carried NHS routes, these bridges had almost 50% of total deck area on all bridges, and carried more than 70% of total bridge traffic in 2004. As a result, FHWA has emphasized bridges that carry the NHS with regards to national performance measures. Frequently these performance measures are defined in terms of the number of deficient bridges, sometimes only in terms of structurally deficient bridges, and in some cases FHWA performance measures include reference to total bridge deck area and traffic volumes carried.

4 NBI Bridge Condition Categories

In the *C&P Reports*, bridge performance is usually discussed in terms of bridges that are "deficient" and bridges that are "not deficient". The NBI coding manual specifies criteria for two types of deficient bridges, either structurally deficient or functionally obsolete; and all bridges that do not meet either criteria are classified as bridges that are not deficient. The NBI *status* data field contains the bridge condition rating.

Bridge inspections are typically conducted on a bi-annual basis, with *fracture critical* bridges (bridge designs with non-redundant structural elements) inspected annually. Also, FHWA may permit 4 year inspection cycles for some recently built and highly rated bridges. Bridge owners are required to report inspection and condition information (annually at a minimum). Condition ratings range from a low of 0 up to 9 and are used to determine the final bridge condition *status* rating.

4.1 Structurally Deficient Bridges

The structurally deficient (SD) rating refers to bridges with one or more structural defects that require attention. While a bridge classified as SD is the most severe condition, it does not necessarily mean that a bridge is unsafe; although the posting of vehicle weight restrictions may be required. NBI criteria for a structurally deficient bridge rating are shown in Exhibit 7. Additional information on appraisal rating codes is included in section 4.3.

Exhibit 7: Criteria for Structurally Deficient Classification

Source: FHWA FAPG 23 CFR 650, Subpart D Non-Regulatory Supplement

A condition rating of 4 or less for any of the following data items:	Or a condition appraisal rating of 2 or less for any of the following data items:
• Item 58 Deck Rating, or • Item 59 Superstructure Rating, or • Item 60 Substructure Rating, or • Item 62 Culvert & Retaining Wall Rating	• Item 67 Structural Evaluation, or • Item 71 Waterway Adequacy

A full listing of condition ratings as described in the NBI Coding manual is shown below:

9 EXCELLENT CONDITION
8 VERY GOOD CONDITION - no problems noted.
7 GOOD CONDITION - some minor problems.
6 SATISFACTORY CONDITION - structural elements show some minor deterioration.
5 FAIR CONDITION - all primary structural elements are sound but may have minor section loss, cracking, spalling or scour.
4 POOR CONDITION - advanced section loss, deterioration, spalling or scour.
3 SERIOUS CONDITION - loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.
2 CRITICAL CONDITION - advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.

1 "IMMINENT" FAILURE CONDITION - major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put back in light service.

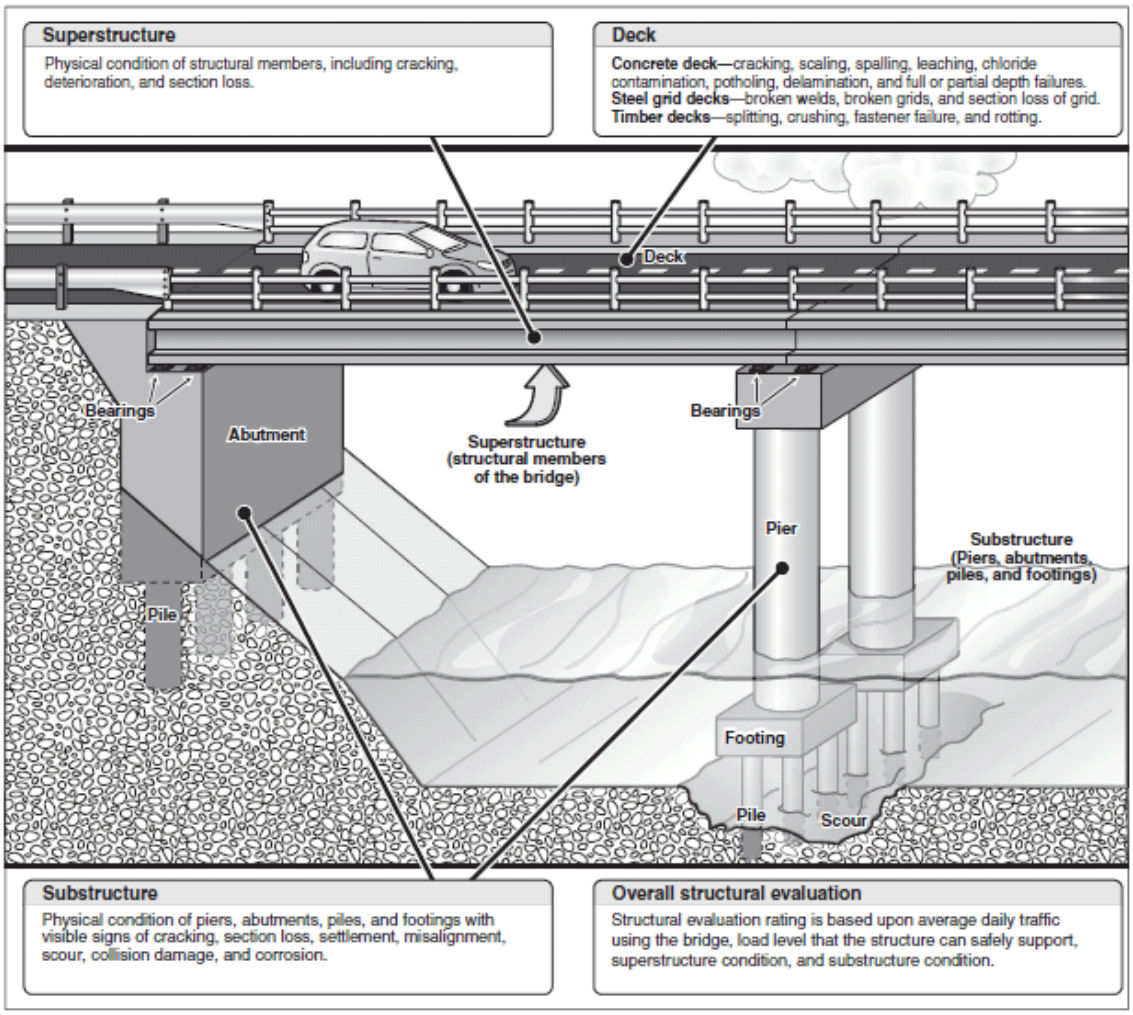
0 FAILED CONDITION - out of service - beyond corrective action.

Exhibit 8 provides a graphic example of key factors affecting SD classification, and also provides examples of some of the most common types of deterioration that impact bridge condition.

Exhibit 8: Key Factors for Classification as Structurally Deficient Bridge

Source: GAO-08-1043, pg13, September 2008

Figure 1: Key Factors That May Contribute to a Bridge's Classification as Structurally Deficient



Source: GAO.

4.2 Functionally Obsolete Classification

The functionally obsolete (FO) rating refers to brides with existing geometric issues that do not meet current design standards based on current traffic demands. While these bridges are considered deficient, a bridge classified as FO does not necessarily

mean that a bridge is unsafe. NBI criteria for a functionally obsolete bridge rating are shown in Exhibit 9.

Exhibit 9: Criteria for Functionally Obsolete Classification

Source: FHWA FAPG 23 CFR 650 Subpart D, Non-Regulatory Supplement

A condition rating of 3 or less for any of the following data items:	Or a condition appraisal rating of 3 or less for any of the following data items:
• Item 68 Deck Geometry Rating, or • Item 69 Underclearance Rating, or • Item 72 Approach Roadway Alignment Rating	• Item 67 Structural Evaluation, or • Item 71 Waterway Adequacy

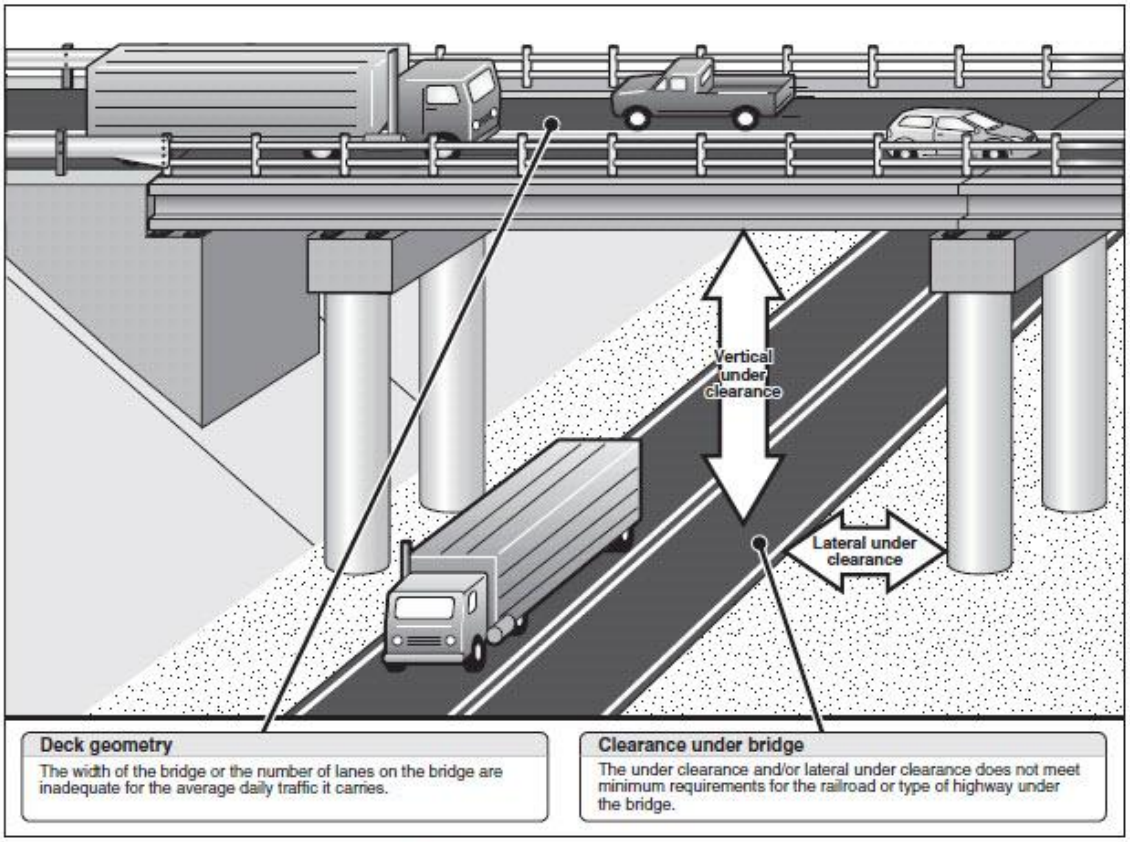
The same condition descriptions described in the previous section also apply to the functionally obsolete bridge classification. Additional detail regarding the appraisal rating descriptions will be included in section *4.3 Structural Evaluation*.

Exhibit10 provides a graphic example of key factors affecting FO classification, which also provides examples of some of the most common types of deterioration that impact bridge condition.

Exhibit 10: Key Factors for Classification as Functionally Obsolete Bridge

Source: GAO-08-1043, pg 15, September 2008

Figure 2: Key Factors That May Contribute to a Bridge's Classification as Functionally Obsolete



Source: GAO.

It is possible for a bridge to meet the criteria for both SD and FO, in which case the bridge is considered Structurally Deficient.

4.3 Structural Evaluation

The *structural evaluation* data field (NBI data item 67) is an appraisal rating that describes bridge condition relative to current design criteria, and identifies bridges requiring priority treatment.

The structural evaluation data item is calculated based on reported condition ratings from the field inspection report. A full listing of the range of condition appraisal ratings as described in the NBI Coding manual is shown below:

9 Superior to present desirable criteria
8 Equal to present desirable criteria
7 Better than present minimum criteria
6 Equal to present minimum criteria
5 Somewhat better than minimum adequacy to tolerate being to be left in place as is
4 Meets minimum tolerable limits to be left in place as is
3 Basically intolerable requiring high priority of corrective action
2 Basically intolerable requiring high priority of replacement
1 This value of rating code not used
0 Bridge closed

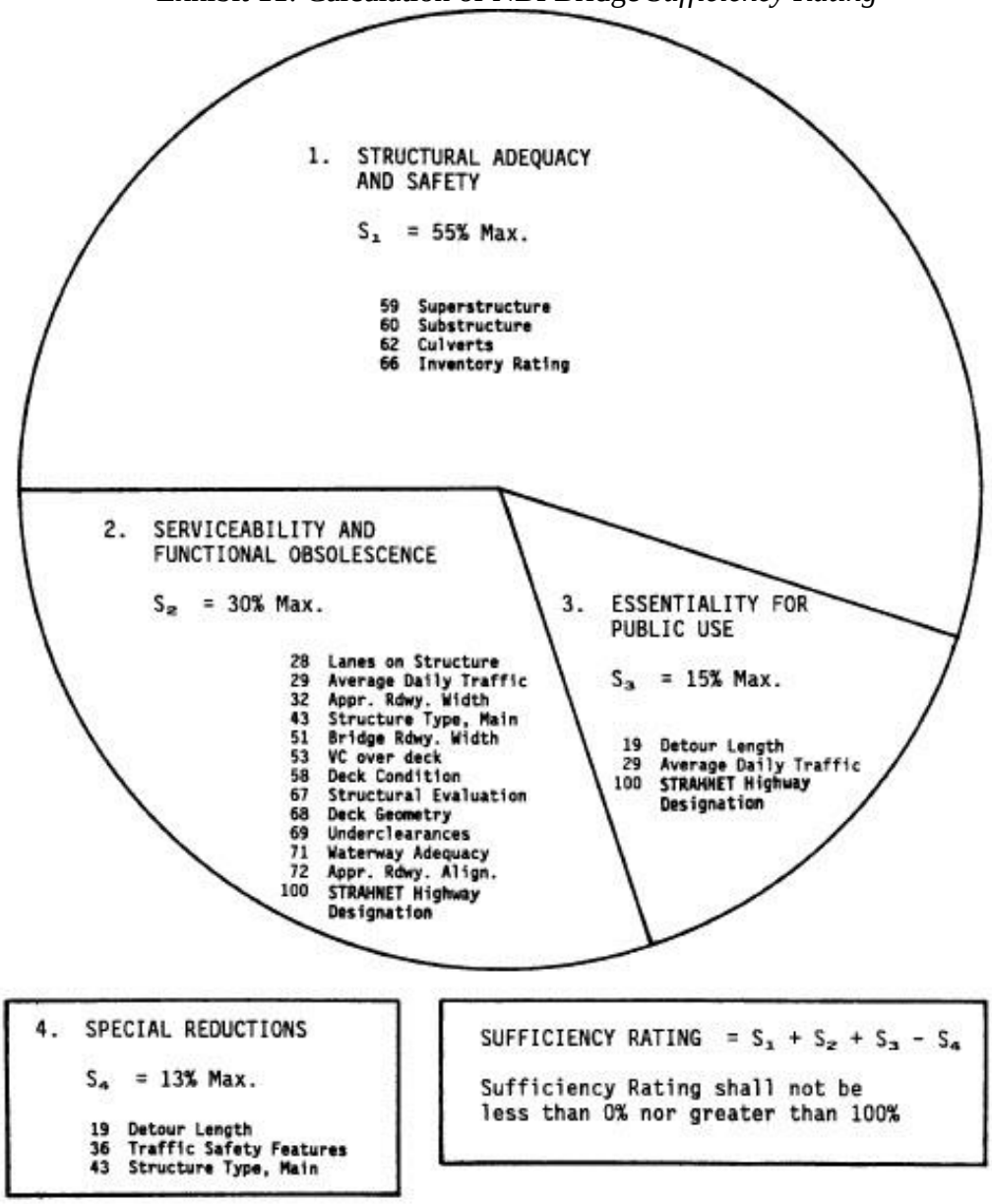
The *structural evaluation* data item rates bridges relative to current design criteria, adds a prioritization perspective, and is considered by some to be the truest measure of the structural fitness of a bridge. This data item provides an overall rating of bridge condition based on the separately rated structural components of the bridge.

Forecasting the rate of bridge deteriorization is a complex issue that involves a wide range of considerations including local climate, bridge design type and materials, bridge length, various detailed bridge characteristics, as well as overall traffic and truck volumes. Predictive models, such as Pontis, are usually involved in the forecast process as part of statewide bridge management systems. For additional information regarding national initiatives regarding prioritizing bridge replacement and rehabilitation, see House Report 110-750 - National Highway Bridge Reconstruction and Inspection Act of 2007, which promoted the need to develop an improved risk-based and data driven process for states to assign priority for the replacement and rehabilitation of all federal-aid bridges.

4.4 Sufficiency Rating

Sufficiency Rating (SR) represents a measure of a bridge's sufficiency to remain in service. The Sufficiency Rating (SR) formula is a method of evaluating highway bridge data by calculating four separate factors to obtain a numeric value which is indicative of bridge sufficiency to remain in service. This data item ranges from a low value of 0 to a high value of 100. The SR data item is determined through the complicated calculation process illustrated in Exhibit 11, and the calculation of this data item is described in a six page appendix in the NBI coding manual, Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, FHWA 1995. .

Exhibit 11: Calculation of NBI Bridge *Sufficiency Rating*



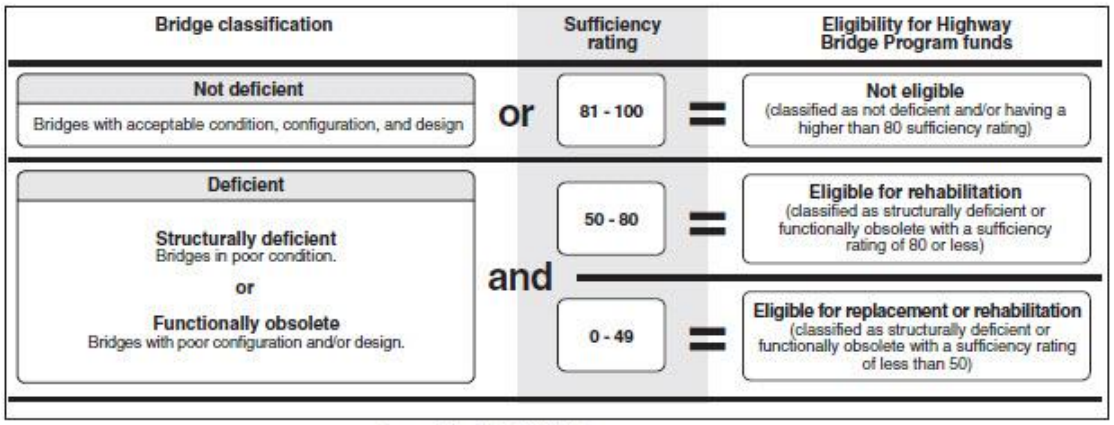
Source: Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, FHWA, 1995

The Sufficiency Rating is used to establish the Federal Eligible Bridge list, which then is used to calculate the annual Highway Bridge Replacement and Rehabilitation Program (HBRRP) apportionment at the state level. If a bridge has a sufficiency rating less than 81 and it is classified as a deficient bridge (either structurally deficient or functionally obsolete) then it becomes eligible for HBRRP funding, as shown in Exhibit 12.

Exhibit 12: Sufficiency Rating Criteria for HBRRP Funding Eligibility

Source: GAO-08-1043, pg 16, September 2008

Figure 3: Process for Designating Bridges as Eligible for HBP Funding

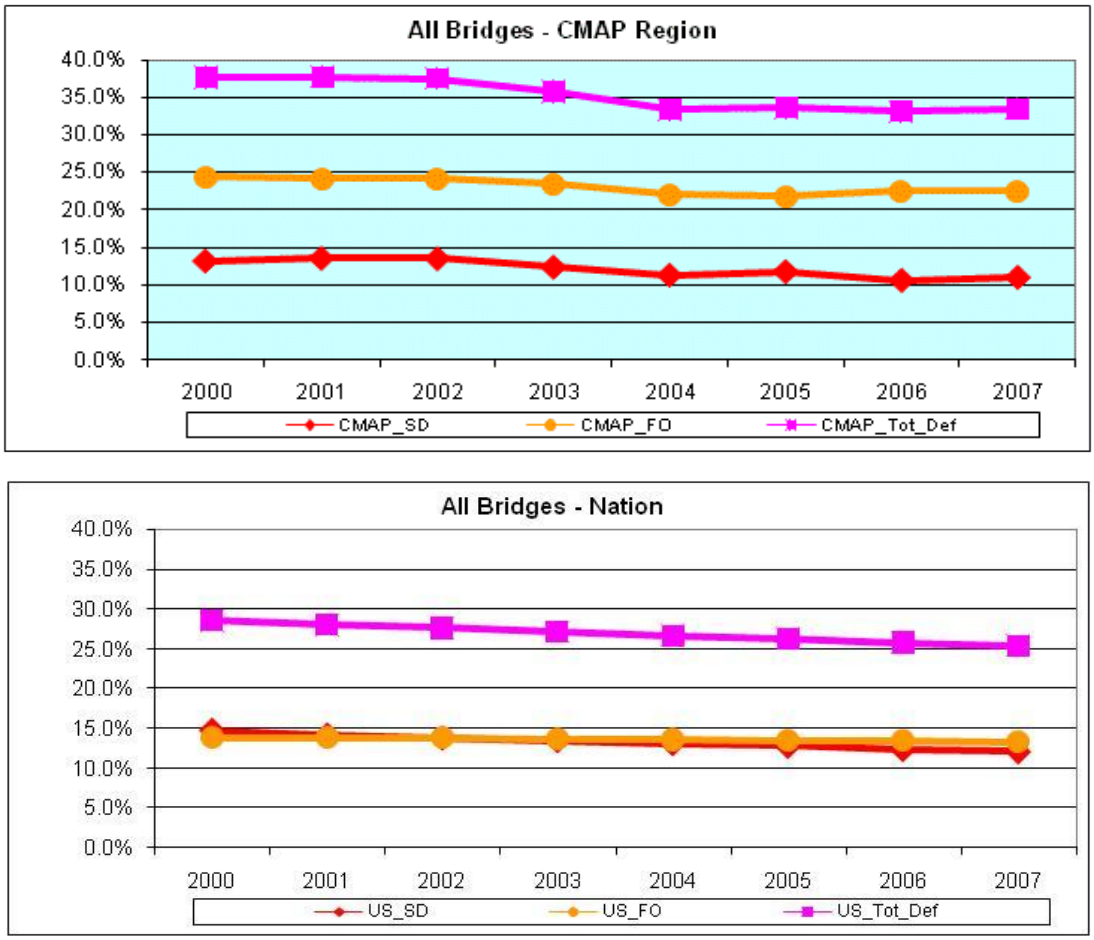


Sources: GAO analysis of FHWA data.

5 Bridge Conditions: Historical Trends and 2007 Conditions

According to NBI data, there has been almost a 40% decline in the number of structurally deficient bridges over the period 1992 through 2007. The NBI reported over 120,000 structurally deficient bridges across the nation in 1992, compared to approximately 72,500 in 2007. Over the same time period structurally deficient bridges in Illinois declined by 43%, and 35% within the CMAP region. These improvements were achieved despite significant increases in traffic volumes over the same period.

Exhibit 13: Historic Trends: CMAP Region and the Nation



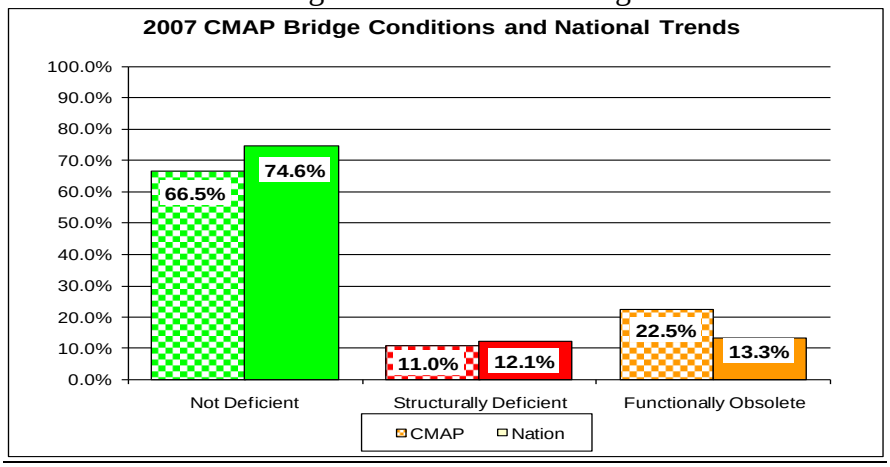
SD = Structurally Deficient FO = Functionally Obsolete Tot_Def = SD + FO

As shown in Exhibit 13, bridge conditions in the CMAP region show similar overall progress, but there is a significant difference related to the large component of functionally obsolete bridges in the CMAP region. The percentage of structurally deficient bridges for both the CMAP region and nation were similar, and have both generally declined from 15% to 10%. The percentage of functionally obsolete bridges also declined for the CMAP region, although the regional rate is shown to be almost double the national rate.

A comparison of 2007 bridge condition between the CMAP region and the nation is shown in Exhibit 14. Based on review of the 2007 NBI database the percentage of structurally deficient bridges (11.0%) in the CMAP region is actually lower than the

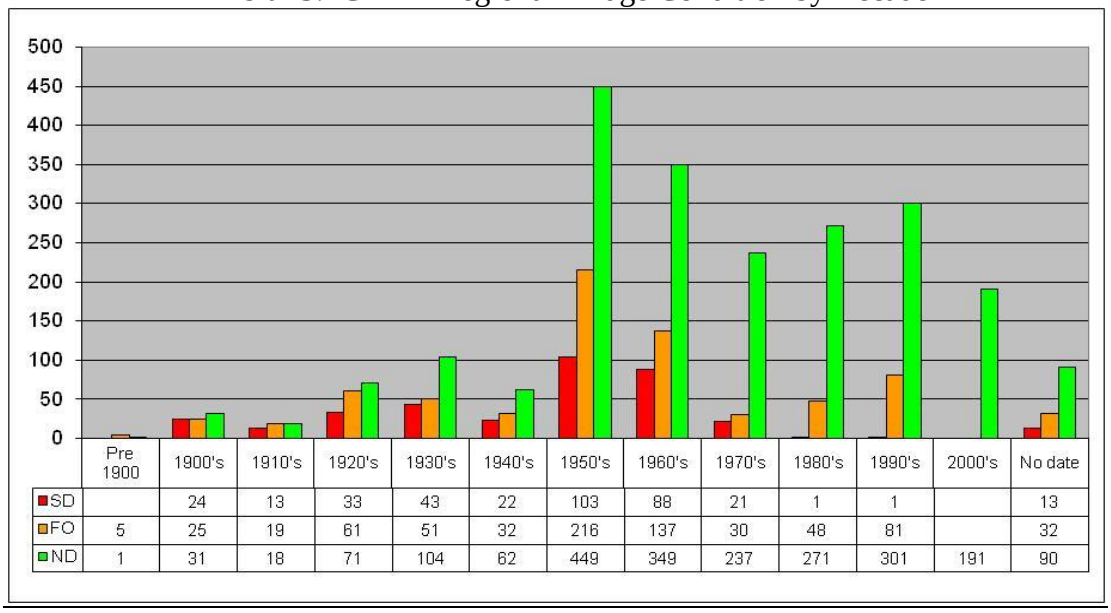
national percentage of 12.1%. However, 22.5% of bridges in the CMAP region have met the criteria for functionally obsolete bridges, compared to only 13.3% nationwide. Although the structurally deficient category is the most serious concern, functionally obsolete bridges are also considered deficient. As a result, 74.6% of the nation's bridges were reported as not deficient, while only 66.5% of bridges in the CMAP region were not deficient.

Exhibit 14: 2007 Bridge Condition: CMAP region and the Nation



Further review of NBI data shows a clear relationship between the age of bridges and the onset of deficient bridge conditions. As shown in Exhibit 15, the number bridges classified as deficient rise sharply with bridges built in the 1950's and 1960's. This is a critical issue for major bridge rehabilitation work, such as bridge deck replacement, which is expected once a bridge reaches 40 to 50 years of life. As discussed in section 3.2, in the time period between 2008 and 2012 more than one in five bridges in the CMAP region will reach the critical age of 50 years, with many of these already classified as deficient bridges.

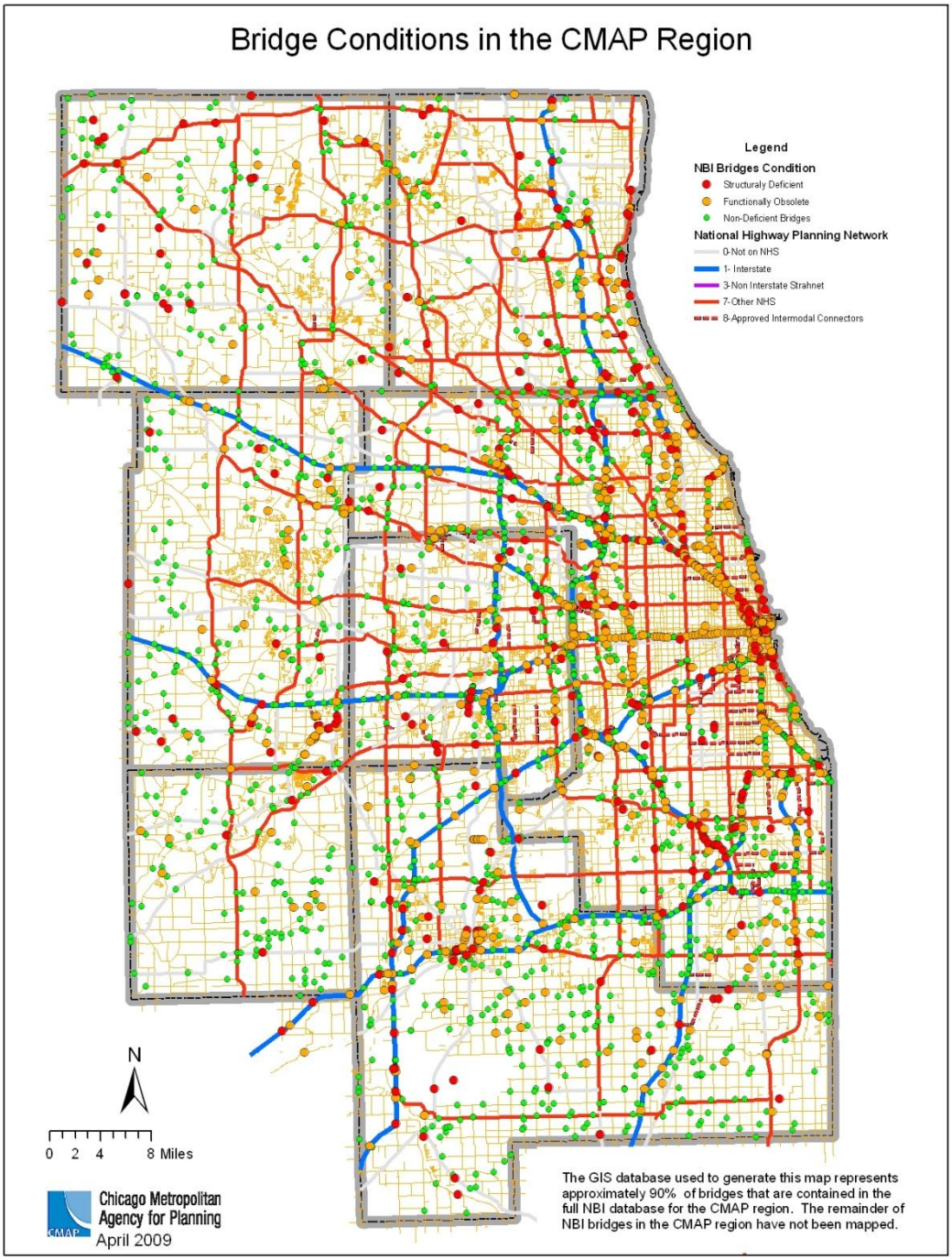
Exhibit 15: CMAP Regional Bridge Condition by Decade



	Pre 1900	1900's	1910's	1920's	1930's	1940's	1950's	1960's	1970's	1980's	1990's	2000's	No date
SD		24	13	33	43	22	103	88	21	1	1		13
FO	5	25	19	61	51	32	216	137	30	48	81		32
ND	1	31	18	71	104	62	449	349	237	271	301	191	90

CMAP staff developed a GIS coverage for NBI bridges for which location information was available. The map shown in Exhibit 16, along with others included in the Appendix, present a spatial distribution of NBI bridge conditions in the CMAP region. This GIS coverage includes about 90% of NBI bridges in the region.

Exhibit 16: Geographic Distribution of NBI Bridges in the CMAP Region

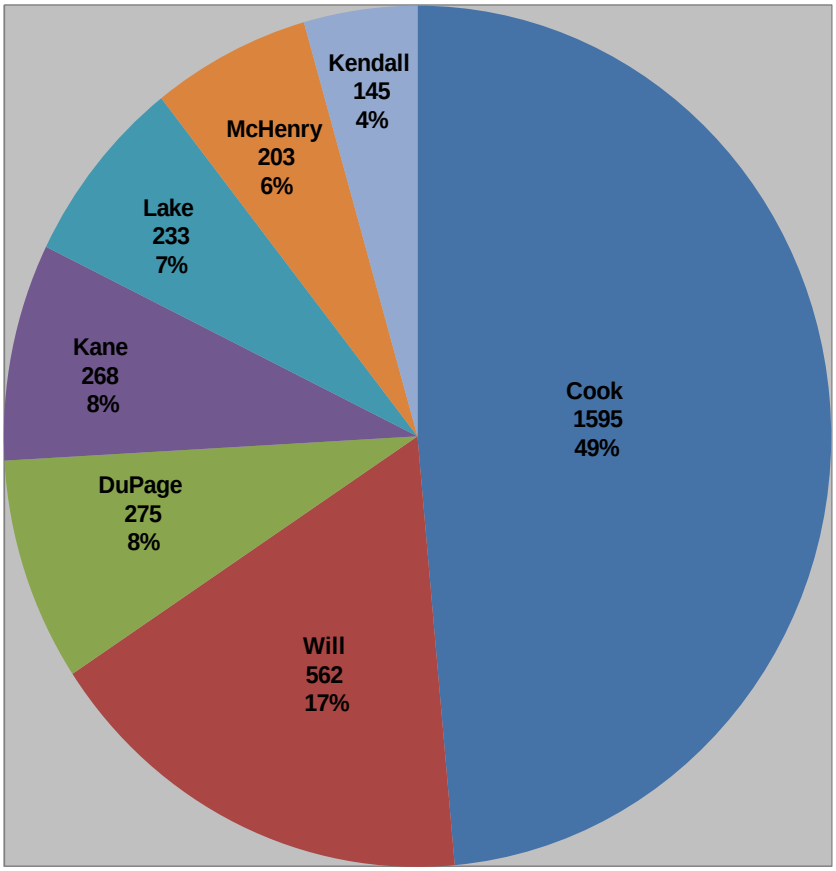


6 2007 Bridge Condition by County Geography

This section summarizes 2007 bridge condition based on county geography, and provides a spatial perspective on bridge conditions – with a focus on "where" bridges are located. For example, discussion of "Cook County" bridge conditions presents a summary of overall conditions within the county, and should not be interpreted to mean that the Cook County Highway Department owns or is responsible for all of these bridges.

The CMAP planning region consists of seven full counties: Cook, DuPage, Kane, Kendall, Lake, McHenry, and Will. One township in Grundy County (Aux Sable) has also been included in the CMAP transportation planning area, and for the purposes of this report, Aux Sable Township bridges will be included with Kendall County totals and averages. A distribution of bridges by county geography is shown in Exhibit 17.

Exhibit 17: NBI Bridges by County Geography



Section 6.1 summarizes the CMAP region from the perspective of county geographies based on information from Exhibit 18, and the individual county geographies are discussed in sections 6.2 through 6.8.

Exhibit 18: 2007 Bridge Condition Statistics by County Geography

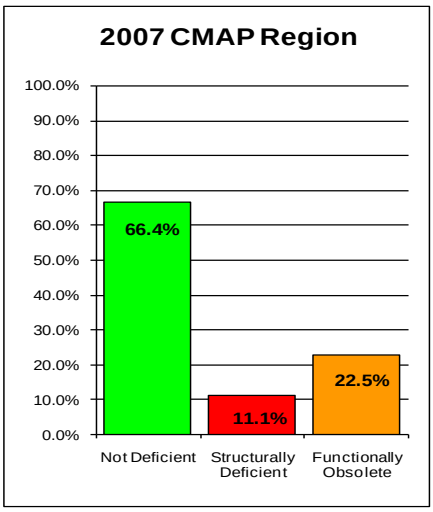
Number of Bridges	Cook	DuPage	Kane	Kendall*	Lake	McHenry	Will	CMAP Region
Structurally Deficient	191	30	22	5	38	20	56	362
Functionally Obsolete	476	38	45	13	46	23	96	737
Deficient	667	68	67	18	84	43	152	1,099
Not Deficient	923	207	200	127	149	160	409	2,175
Total NBI Bridges	1,590	275	267	145	233	203	561	3,274
% Regional NBI Bridges	**48.6%**	**8.4%**	**8.2%**	**4.4%**	**7.1%**	**6.2%**	**17.1%**	
High Priority Replacement	14	3	1	1	9	4	7	**39**
High Priority Corrective Action	26	8	0	0	6	6	6	**52**
Meets Minimum Tolerable Limits	101	16	18	4	18	20	30	**207**
Carries NHS	769	120	60	12	74	38	123	**1,196**
Carries Strahnet System	424	65	19	4	18	2	69	**601**

Percentage of County	Cook	DuPage	Kane	Kendall*	Lake	McHenry	Will	CMAP Region
Structurally Deficient	12.0%	10.9%	8.2%	3.4%	16.3%	9.9%	10.0%	**11.1%**
Functionally Obsolete	29.9%	13.8%	16.9%	9.0%	19.7%	11.3%	17.1%	**22.5%**
Not Deficient	58.1%	75.3%	74.9%	87.6%	63.9%	78.8%	72.9%	**66.4%**
High Priority Replacement	0.9%	1.1%	0.4%	0.7%	3.9%	2.0%	1.2%	**1.2%**
High Priority Corrective Action	1.6%	2.9%	0.0%	0.0%	2.6%	3.0%	1.1%	**1.6%**
Meets Minimum Tolerable Limits	6.4%	5.8%	6.7%	2.8%	7.7%	9.9%	5.3%	**6.3%**
Carries NHS	48.4%	43.6%	22.5%	8.3%	31.8%	18.7%	21.9%	**36.5%**
Carries Strahnet System	26.7%	23.6%	7.1%	2.8%	7.7%	1.0%	12.3%	**18.4%**

County Averages	Cook	DuPage	Kane	Kendall*	Lake	McHenry	Will	CMAP Region
Sufficiency rating	80.2	83.11	82.48	89.79	79.59	80.72	85.63	**81.9**
Year Built	1960.1	1969.2	1964	1978.9	1962.2	1965.8	1970	**1964.3**
ADT	36,662	35,137	10,848	3,737	14,210	5,112	10,157	**24,884**
% Trucks	8.25%	6.87%	7.74%	6.68%	5.15%	8.42%	7.53%	**7.69%**

Kendall* includes bridges in Kendall County and from Aux Sable Township in Grundy County.

6.1 CMAP Region by County Geography



#	%	Bridge Category
362	11.1%	Structurally Deficient
737	22.5%	Functionally Obsolete
2,175	66.4%	Not Deficient
3,274		Total NBI Bridges
39	1.2%	High Priority Replacement
52	1.6%	High Priority Corrective Action
207	6.3%	Meets Minimum Tolerable Limits
1,196	36.5%	Carries National Highway System
601	18.4%	Carries Strahnet System
81.88		Sufficiency Rating (Average)
1964.3		Year Built (Average)
24,884		ADT (Average)
7.69%		% Trucks (Average)

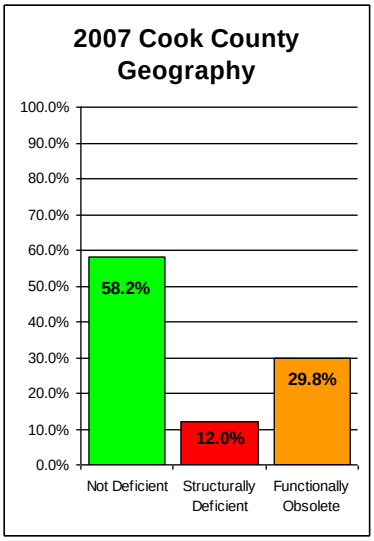
The 2007 NBI reported that 3,274 bridges were geographically located within in the CMAP region. The average bridge was built in 1964, with a 2007 average Sufficiency rating of 81.9. Within the CMAP region a total of 362 bridges (11.1 %) were classified as structurally deficient, and another 737 (22.5%) as functionally obsolete. Region-wide, based on the structural evaluation field (NBI data item 67), there were 39 (1.2%) bridges identified as "high priority for replacement,"52 (1.6%) "High Priority for Corrective Action," and another 207 (6.3%) bridges that "meet minimum tolerable limits to be left in place as is."

Observations regarding bridges within the CMAP Region by county geography include:

- Structurally Deficient Bridges: 362 (11.1%) of bridges in the region were classified as structurally deficient. Approximately 80 % of SD bridges were located within 3 Counties: Cook 53%, Will 16% and Lake 11%.
- Functionally Obsolete Bridges: 737 (22.5%) of bridges in the region were classified as Functionally Obsolete. Almost 80% were located within 2 Counties: Cook 65% and Will 13%.
- High Priority for Replacement: 39 (1.2%) of bridges in the region were identified as HP Replacement. More than 75% of these bridges were located within 3 Counties: Cook 36%, Lake 23%, and Will 18%.
- High Priority for Corrective Action: 52 (1.6%) of bridges in the region were identified as HP Corrective Action Bridges. 50% of these bridges were located with Cook County. There was a relatively even split of the other 50% between DuPage, Lake, McHenry and Will Counties.
- Minimum Tolerable: 207 (6.3%) of bridges in the region were identified as minimum tolerable bridges. Nearly 65% of these bridges were located within 2 Counties: Cook 49% and Will 14%.
- NHS Bridges: 1,196 (36.5%) of bridges in the region carry NHS routes. Almost 85% of NHS bridges were located within 3 counties: Cook 64%, Will 10%, and DuPage 10%.

- Year Built: the average bridge in the region was built in 1964. Region-wide, county averages range from 1960 in Cook County to 1978 in Kendall County.
- Sufficiency Rating: the regional 2007 average bridge sufficiency rating was 81.9. Region-wide county averages ranged between low ratings of 79.6 in Lake and 80.0 in Cook Counties up to 89.8 in Kendall County.
- STRAHNET Bridges: 601 (18.4%) of bridges in the region carried STRAHNET routes. More than 90% of STRAHNET bridges were located in 3 Counties: Cook 70%, Will 12% and DuPage 11%.
- ADT Carried: the average bridge in the region carried an ADT of 24,884. ADT ranges as high as 300,000 vehicles per day; and 137 (4%) of bridges carried more than 100,000 vehicles per day. More than 97% of these bridges were located within 2 Counties: Cook 85% and DuPage 13%. 1,459 bridges, 45% of total regional bridges, carried traffic levels below 10,000 ADT.
- % Truck Traffic Carried: the average bridge in the region carried an average of 7.7% truck traffic, which calculates to an average of 1,900 Truck ADT per bridge. Based on 2007 NBI data, there were 140 bridges that carried average truck volumes in excess 10,000 trucks per day, with 80% reported within Cook County with another 11% in DuPage County.
- Fracture Critical Bridges: 100 (3.1%) of bridges in the region were classified as fracture critical bridges. More than 90% of these *fracture critical* bridges were located within Cook (78%) and Will (13%) Counties.
- Navigation Control Required: 116 (3.5%) of bridges in the region were classified as requiring *navigational control* on a waterway. All 116 of these bridges were located within Cook and Will Counties, with 102 and 14 respectively.

6.2 Cook County



#	%	Bridge Category
191	12.0%	Structurally Deficient
476	29.9%	Functionally Obsolete
923	58.1%	Not Deficient
1,590		Total NBI Bridges
14	0.9%	High Priority Replacement
26	1.6%	High Priority Corrective Action
101	6.4%	Meets Minimum Tolerable Limits
769	48.4%	Carries National Highway System
424	26.7%	Carries Strahnet System

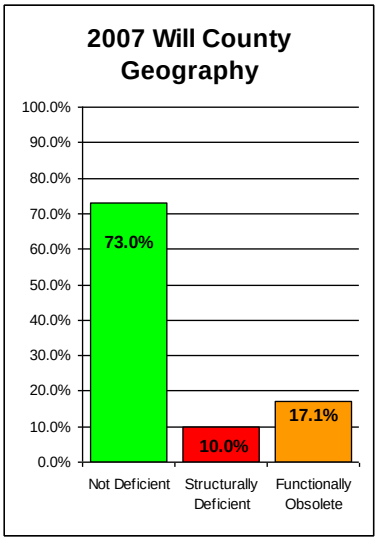
80.2	Sufficiency Rating (Average)
1960.1	Year Built (Average)
36,662	ADT (Average)
8.25%	% Trucks (Average)

The 2007 NBI reported that 1,590 bridges, 48.6% of bridges in the CMAP region, were geographically located within Cook County. The average bridge in Cook County was built in 1960, with a 2007 average sufficiency rating of 80.2. A total of 191 bridges (12.0%) were classified as structurally deficient, and another 476 (29.9%) as functionally obsolete. Based on the structural evaluation field (NBI data item 67), there were 14 (0.9%) bridges identified as "high priority for replacement,"26 (1.6%) "high priority for corrective action," and another 101 (6.4 %) bridges that "meet minimum tolerable limits to be left in place as is."

Major observations regarding bridges within Cook County include:

- The average bridge in Cook County was built in 1960, which was 4 years older than the regional average. At the county level of geography, Cook County bridges were the oldest in the region.
- The average bridge sufficiency rating was the 2nd worst in the region. The average bridge in Cook County met the sufficiency rating criteria for HBRRP funding eligibility.
- The Cook County rate for structurally deficient was the 2nd worst, functionally obsolete was the worst, and for total deficient bridges was the worst in the CMAP region. Approximately 42% of the bridges in Cook County were classified as deficient.
- Cook County bridges carried the highest ADT in the CMAP Region.
- 64% of bridges that carry NHS routes, and 72% of bridges that carry expressways are geographically within Cook County.

6.3 Will County



#	%	Bridge Condition
56	10.0%	Structurally Deficient Bridges
96	17.1%	Functionally obsolete Bridges
409	72.9%	Not Deficient Bridges
561		Total Bridges
7	1.2%	High Priority Replacement
6	1.1%	High Priority Corrective Action
30	5.3%	Minimum Tolerable Condition
123	21.9%	NHS
69	12.3%	Strahnet

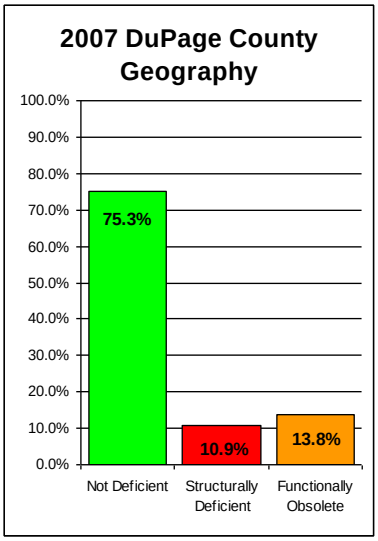
85.63	Sufficiency Rating (Average)
1970	Year Built (Average)
10,157	ADT (Average)
7.53%	% Trucks (Average)

The 2007 NBI reported that 561 bridges, 17.1% of bridges in the CMAP region, were geographically located within Will County. The average Will County bridge was built in 1970, with a 2007 average sufficiency rating of 85.6. A total of 56 bridges (10.0%) were classified as structurally deficient, 96 (17.1%) as functionally obsolete. Based on the structural evaluation field (NBI data item 67), there were 7 (1.2%) bridges identified as "high priority for replacement,"6 (1.1%) "high priority for corrective action," and another 30 (5.3%) bridges that "meet minimum tolerable limits to be left in place as is."

Major observations regarding bridges within Will County include:

- The average bridge in Will County was built in 1970, which 6 years younger than the regional average.
- The average bridge Sufficiency Rating was the 2nd best in the region.
- The Will County rate for structurally deficient was the regional median, functionally obsolete was the 3rd worst and for total deficient bridges was the 3rd worst in the CMAP region.
- Will County bridges carried the 3rd lowest ADT in the CMAP region.
- 10% of bridges that carry NHS routes, and 11% of bridges that carry expressway are geographically within Will County.

6.4 DuPage County



#	%	Bridge Category
30	10.9%	Structurally Deficient
38	13.8%	Functionally Obsolete
207	75.3%	Not Deficient
275		Total NBI Bridges
3	1.1%	High Priority Replacement
8	2.9%	High Priority Corrective Action
16	5.8%	Meets Minimum Tolerable Limits
120	43.6%	Carries National Highway System
65	23.6%	Carries Strahnet System

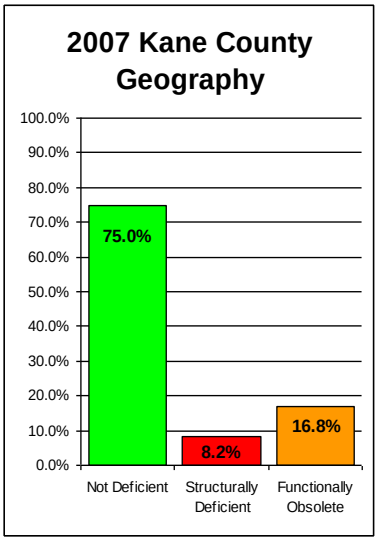
83.11	Sufficiency Rating (Average)
1969.2	Year Built (Average)
35,137	ADT (Average)
6.87%	% Trucks (Average)

The 2007 NBI reported that 275 bridges, 8.4% of bridges in the CMAP region, were geographically located within DuPage County. The average DuPage County bridge was built in 1969, with a 2007 average sufficiency rating of 83.1. A total of 30 bridges (10.9%) were classified as structurally deficient, and another 38 (13.8%) as functionally obsolete. Based on the structural evaluation field (NBI data item 67), there were 3 (1.1%) bridges identified as "high priority for replacement,"8 (2.9%) "high priority for corrective action," and another 16 (5.8%) bridges that "meet minimum tolerable limits to be left in place as is."

Major observations regarding bridges within DuPage County include:

- The average bridge in DuPage County was built in 1969, which 5 years younger than regional average.
- The average bridge sufficiency rating was the 3rd best in the region.
- The DuPage County rate for structurally deficient was the 3rd worst, functionally obsolete was the 3rd best and for total deficient bridges was the 3rd best in the CMAP region.
- DuPage County bridges carried the 2nd highest ADT in the CMAP region.
- 10% of bridges that carry NHS routes, and 11% of bridges that carry expressway are geographically within DuPage County.

6.5 Kane County



#	%	Bridge Category
22	8.2%	Structurally Deficient
45	16.9%	Functionally Obsolete
200	74.9%	Not Deficient
267		Total NBI Bridges
1	0.4%	High Priority Replacement
0	0.0%	High Priority Corrective Action
18	6.7%	Meets Minimum Tolerable Limits
60	22.5%	Carries National Highway System
19	7.1%	Carries Strahnet System

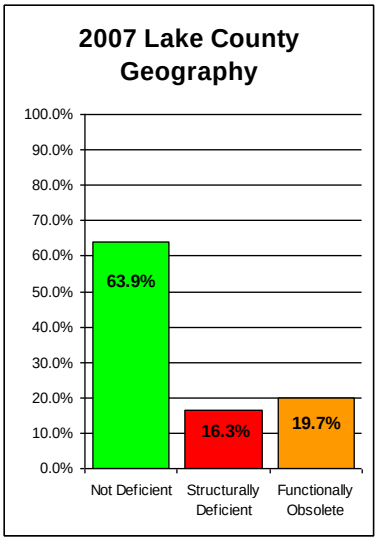
82.48	Sufficiency Rating (Average)
1964	Year Built (Average)
10,848	ADT (Average)
7.74%	% Trucks (Average)

The 2007 NBI reported that 267 bridges, 8.2% of bridges in the CMAP region, were geographically located within Kane County. The average Kane County bridge was built in 1964, with a 2007 average sufficiency rating of 82.5. A total of 22 bridges (8.2%) were classified as structurally deficient, and another 45 (16.9%) as functionally obsolete. Based on the structural evaluation field (NBI data item 67), there was 1 (0.4%) bridges identified as "high priority for replacement,"0 (0.0 %) "high priority for corrective action," and another 18 (6.7%) bridges that "meet minimum tolerable limits to be left in place as is."

Major observations regarding bridges within Kane County include:

- The average bridge in Kane County was built in 1964, which matched the regional average.
- The average bridge sufficiency rating was slightly above the average for the CMAP region.
- The Kane County rate for structurally deficient was the 2nd best, with median rates for functionally obsolete and for total deficient bridges in the CMAP region.

6.6 Lake County



#	%	Bridge Category
38	16.3%	Structurally Deficient
46	19.7%	Functionally Obsolete
149	63.9%	Not Deficient
233		Total NBI Bridges
9	3.9%	High Priority Replacement
6	2.6%	High Priority Corrective Action
18	7.7%	Meets Minimum Tolerable Limits
74	31.8%	Carries National Highway System
18	7.7%	Carries Strahnet System

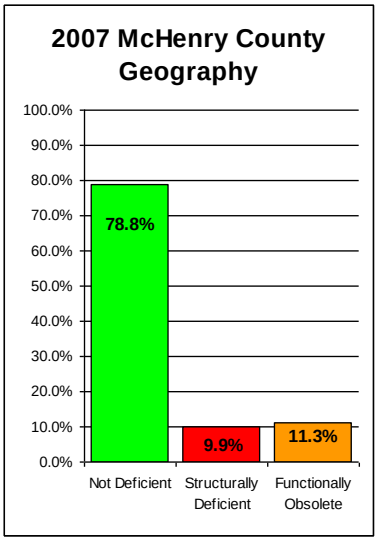
79.59	Sufficiency Rating (Average)
1962.2	Year Built (Average)
14,210	ADT (Average)
5.15%	% Trucks (Average)

The 2007 NBI reported that 233 bridges, 7.1% of bridges in the CMAP region, were geographically located within Lake County. The average Lake County bridge was built in 1962, with a 2007 average sufficiency rating of 79.5. A total of 38 bridges (16.3%) were classified as structurally deficient, and another 46 (19.7%) as functionally obsolete. Based on the structural evaluation field (NBI data item 67), there were 9 (3.9%) bridges identified as "high priority for replacement,"6 (2.6%) "high priority for corrective action," and another 18 (7.7%) bridges that "meet minimum tolerable limits to be left in place as is."

Major observations regarding bridges within Lake County include:

- The average bridge in Lake County was built in 1962, which was 2 years older than the regional average, and 2nd worst in the CMAP region.
- The average bridge sufficiency rating was the worst in the CMAP region. The average bridge in Lake County met the sufficiency rating criteria for HBRRP funding eligibility. More than 33% of bridges within Lake County were classified as deficient.
- The Lake County rate for structurally deficient was the worst, functionally obsolete was the 2nd worst and for total deficient bridges was the 2nd worst in the CMAP region.

6.7 McHenry County



#	%	Bridge Category
20	9.9%	Structurally Deficient
23	11.3%	Functionally Obsolete
160	78.8%	Not Deficient
203		Total NBI Bridges
4	2.0%	High Priority Replacement
6	3.0%	High Priority Corrective Action
20	9.9%	Meets Minimum Tolerable Limits
38	18.7%	Carries National Highway System
2	1.0%	Carries Strahnet System

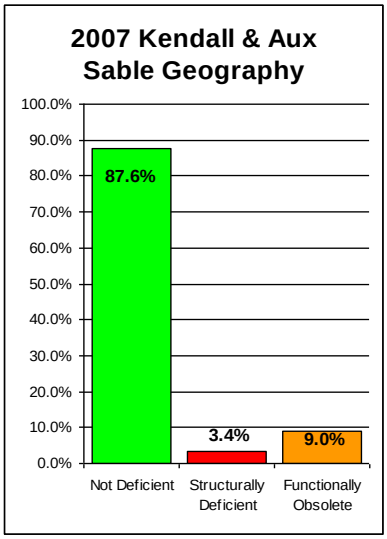
80.72	Sufficiency Rating (Average)
1965.8	Year Built (Average)
5,112	ADT (Average)
8.4%	% Trucks (Average)

The 2007 NBI reported that 203 bridges, 6.2% of bridges in the CMAP region, were geographically located within McHenry County. The average McHenry County bridge was built in 1965, with a 2007 average sufficiency rating of 80.7. A total of 20 bridges (9.9%) were classified as structurally deficient, and another 23 (11.3%) as functionally obsolete. Based on the structural evaluation field (NBI data item 67), there were 4 (2.0%) bridges identified as "high priority for replacement,"6 (3.0%) "high priority for corrective action," and another 20 (9.9%) bridges that "meet minimum tolerable limits to be left in place as is."

Major observations regarding bridges within McHenry County include:

- The average bridge in McHenry County was built in 1965, slightly younger than the regional average.
- The average bridge sufficiency rating was the 3rd worst in the CMAP region. The average bridge in McHenry County met the sufficiency rating criteria for HBRRP funding eligibility.
- The McHenry County rates for structurally deficient was the 3rd best, functionally obsolete 2nd best and for total deficient bridges were the 2nd best in the CMAP region.
- McHenry County bridges carried the 2nd lowest ADT in the CMAP region.

6.8 Kendall County



#	%	Bridge Category
5	3.4%	Structurally Deficient
13	9.0%	Functionally Obsolete
127	87.6%	Not Deficient
145		Total NBI Bridges
1	0.7%	High Priority Replacement
0	0.0%	High Priority Corrective Action
4	2.8%	Meets Minimum Tolerable Limits
12	8.3%	Carries National Highway System
4	2.8%	Carries Strahnet System

89.79	Sufficiency Rating (Average)
1978.9	Year Built (Average)
3,737	ADT (Average)
6.68%	% Trucks (Average)

The 2007 NBI reported that 145 bridges, 4.4% of bridges in the CMAP region, were geographically located within Kendall County. The average Kendall County bridge was built in 1978, with a 2007average sufficiency rating of 89.8. A total of 5 bridges (3.4%) were classified as structurally deficient, and another 13 (9.0%) as functionally obsolete. Based on the structural evaluation field (NBI data item 67), there were 1 (0.7%) bridges identified as "high priority for replacement," 0 (0.0%) "high priority for corrective action," and another 20 (9.9%) bridges that "meet minimum tolerable limits to be left in place as is."

Major observations regarding bridges within Kendall County include:

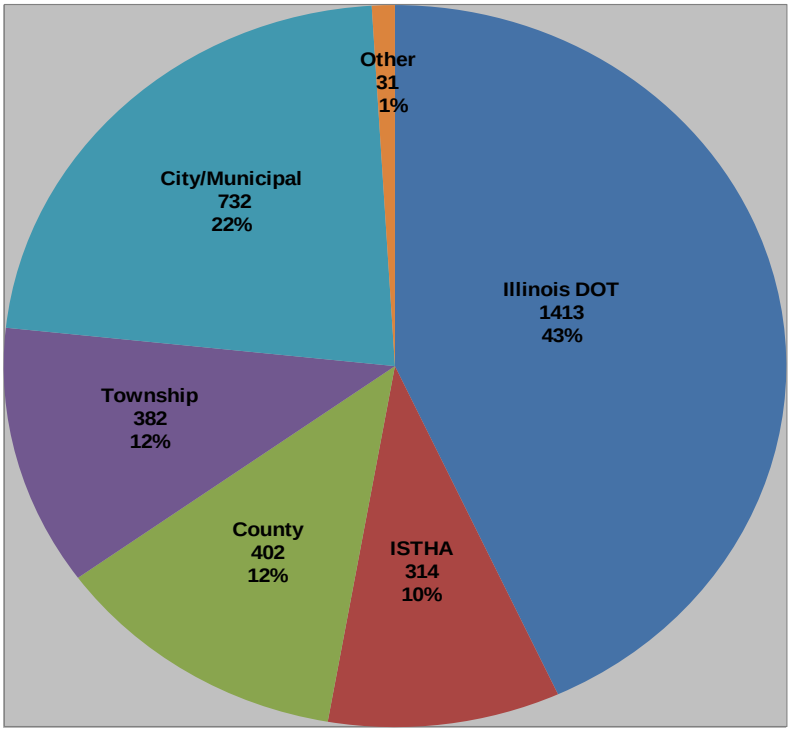
- The average bridge in Kendall County was built in 1978, which was 14 years younger than the regional average.
- The average bridge sufficiency ratings in Kendall County were the best in the CMAP region.
- The Kendall County rates for structurally deficient, functionally obsolete and total deficient bridges were the best in the CMAP region.
- Kendall County bridges carried the lowest ADT volumes in the CMAP region.

7 2007 Bridge Condition by Ownership

This section summarizes 2007 bridge condition based on ownership categories, and provides a ownership perspective on bridge conditions – with a focus on "who" owns the bridges. For example, discussion of County bridge conditions presents a summary of overall conditions for all bridges owned by a county. As noted in section 3.1, the owner agency retains responsibility for bridge condition, even in the event that a secondary agency was contracted for bridge maintenance. The individual county ownership responsibilities are not discussed in this section.

For the purposes of this report, the CMAP planning region is considered with the following ownership categories: Illinois Department of Transportation (IDOT), Illinois State Toll Highway Authority (ISTHA), county (county DOTs combined), townships (combined), municipalities (combined), and other owners (federal, railroad, private). IDOT and ISTHA are actually individual bridge owner agencies. The "Other" category is omitted from this analysis, since this group is responsible for only 1% of the regional bridges. **As a result, the summaries presented in the following sections will compare only these five (5) ownership categories.** A separate section was added to summarize conditions for bridges owned by the City of Chicago. Although already considered as part of municipal ownership, a query of the NBI database indicated that a significant share (8%) of bridges in the region were owned by the City of Chicago. A distribution of bridge ownership is shown in Exhibit 19.

Exhibit 19: NBI Bridges by Ownership Category



Section 7.1 summarizes the CMAP region from the perspective of bridge ownership based on information from Exhibit 20, and the individual ownership categories are discussed in sections 7.2 through 7.7. Please note that the 2007 NBI data used for these summaries is almost 2 years old, and the individual agencies (IDOT, ISTHA, and the City of Chicago) would be the definite source for current bridge conditions.

Exhibit 20: 2007 Bridge Condition Statistics by Ownership Category

Number of Bridges	IDOT	COUNTY	Township	Municipal	ISTHA	City of Chicago	CMAP Region (1)
Structurally Deficient	169	28	16	108	30	42	362
Functionally Obsolete	354	54	45	216	59	123	737
Deficient	523	82	61	324	89	166	1,099
Not Deficient	890	320	321	408	225	117	2,175
Total NBI Bridges	1,413	402	382	732	314	283	3,274

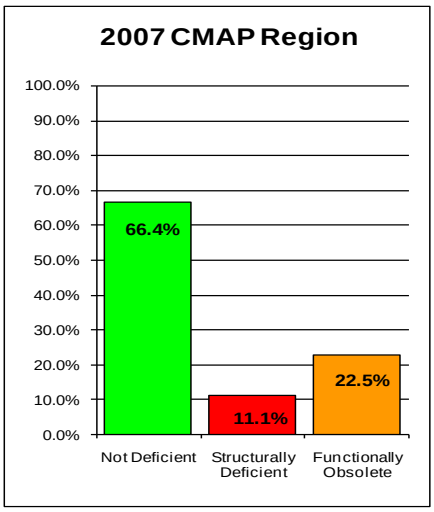
(1) CMAP regional totals. Chicago of Chicago bridges are also included under the Municipal category. A total of 31 bridges owned by other agencies are not broken out in this table.

High Priority Replacement	19	2	3	12	0	3	39
High Priority Corrective Action	27	4	3	17	0	5	52
Meets Minimum Tolerable Limits	74	30	13	68	15	29	207
Carries National Highway System	716	52	0	144	280	134	1,196
Carries Strahnet System	272	0	0	49	277	49	601

Percentage of Owner	IDOT	COUNTY	Township	Municipal	ISTHA	City of Chicago	CMAP Region
Structurally Deficient	12.0%	7.0%	4.2%	14.8%	9.6%	14.8%	11.1%
Functionally Obsolete	25.1%	13.4%	11.8%	29.5%	18.8%	43.5%	22.5%
Not Deficient	62.9%	79.6%	84.0%	55.7%	71.6%	41.7%	66.4%
High Priority Replacement	1.3%	0.5%	0.8%	1.6%	0.0%	1.1%	1.2%
High Priority Corrective Action	1.9%	1.0%	0.8%	2.3%	0.0%	1.8%	1.6%
Meets Minimum Tolerable Limits	5.2%	7.5%	3.4%	9.3%	4.8%	10.2%	6.3%
Carries National Highway System	50.7%	12.9%	0.0%	19.7%	89.2%	47.3%	36.5%
Carries Strahnet System	19.2%	0.0%	0.0%	6.7%	88.2%	17.3%	18.4%

Owner Averages	IDOT	COUNTY	Township	Municipal	ISTHA	City of Chicago	CMAP Region
Sufficiency rating (Average)	81.25	85.12	87.86	79.2	81.69	76.99	81.88
Year Built (Average)	1964.5	1970.9	1971.9	1958.1	1961.6	1951.6	1964.3
ADT (Average)	32,898	10,608	902	13,907	63,306	28,226	24,884
% Trucks (Average)	9.43%	6.89%	4.93%	5.37%	9.98%	9.10%	7.69%

7.1 CMAP Region by Ownership Category



#	%	Bridge Category
362	11.1%	Structurally Deficient
737	22.5%	Functionally Obsolete
2,175	66.4%	Not Deficient
3,274		Total NBI Bridges
39	1.2%	High Priority Replacement
52	1.6%	High Priority Corrective Action
207	6.3%	Meets Minimum Tolerable Limits
1,196	36.5%	Carries National Highway System
601	18.4%	Carries Strahnet System
81.88		Sufficiency Rating (Average)
1964.3		Year Built (Average)
24,884		ADT (Average)
7.69%		% Trucks (Average)

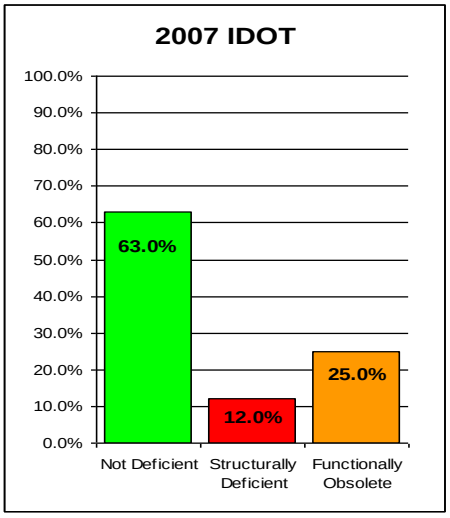
The 2007 NBI reported that 3,274 bridges were geographically located within in the CMAP region. The average bridge was built in 1964, with a 2007 average sufficiency rating of 81.9. Within the CMAP region a total of 362 bridges (11.1%) were classified as structurally deficient, and another 737 (22.5%) as functionally obsolete. Region-wide, based on the structural evaluation field (NBI data item 67), there were 39 (1.2%) bridges identified as "high priority for replacement,"52 (1.6%) "high priority for corrective action," and another 207 (6.3%) bridges that "meet minimum tolerable limits to be left in place as is."

Major observations comparing bridge ownership categories within the CMAP region include:

- Structurally Deficient Bridges: 362 (11.1%) of bridges in the region were classified as structurally deficient. More than 75% of SD bridges were owned by IDOT 47% and municipal agencies 30%.
- Functionally Obsolete Bridges: 737 (22.5%) of bridges in the region were classified as functionally obsolete. More than 75% were owned by IDOT 48% and municipal agencies 29%.
- High Priority for Replacement: 39 (1.2%) of bridges in the region were identified as HP replacement bridges. More than 80% of these bridges were owned by IDOT 49% and municipal agencies 31%.
- High Priority for Corrective Action: 52 (1.6%) of bridges in the region were identified as HP corrective action bridges. 85% of these bridges were owned by IDOT 52% and municipal agencies 33%.
- Minimum Tolerable: 207 (6.3%) of bridges in the region were identified as minimum tolerable bridges. Nearly 70% of these bridges were owned by IDOT 35% and municipal agencies 33%.
- NHS Bridges: 1,196 (36.5%) of bridges in the region carry NHS routes. More than 80% of NHS bridges were owned by IDOT 60% and ISTHA 23%.

- Year Built: the average bridge in the region was built in 1964. Region-wide owner averages range from 1958 for municipal agencies to 1971 for townships.
- Sufficiency Rating: the regional 2007 average bridge sufficiency rating was 81.9. Region-wide owner averages ranged between low ratings of 79.2 for municipal agencies to 87.9 for townships.
- STRAHNET Bridges: 601 (18.4%) of bridges in the region carried STRAHNET routes. More than 90% of STRAHNET bridges were owned by ISTHA 46% and IDOT 45%.
- ADT Carried: the average bridge in the region carried an ADT of 24,884. ADT ranges as high as 300,000 vehicles per day, and 137 (4%) bridges carried more than 100,000 vehicles per day. More than 85% of these bridges were owned by IDOT 65% and ISTHA 21%. 1,459 bridges, 45% of total regional bridges, carry traffic levels below 10,000 ADT.
- % Truck Traffic Carried: the average bridge in the region carried an average of 7.7% truck traffic, which calculates to an average of 1,900 truck ADT per bridge. Based on 2007 NBI data, there were 140 bridges that carried average truck volumes more than 10,000 trucks per day, with 58% of these owned by IDOT and another 41% for ISTHA.
- Fracture Critical Bridges: 100 (3.1%) of bridges in the region were classified as fracture critical bridges. Over 90% of these fracture critical bridges were owned by IDOT 58% and municipal agencies 34%.
- Navigation Control Required: 116 (3.5%) of bridges in the region were classified as requiring a navigation permit for waterway traffic traveling under the bridge. More than 90% of these bridges were owned by municipal agencies 54% and IDOT 39%.

7.2 IDOT



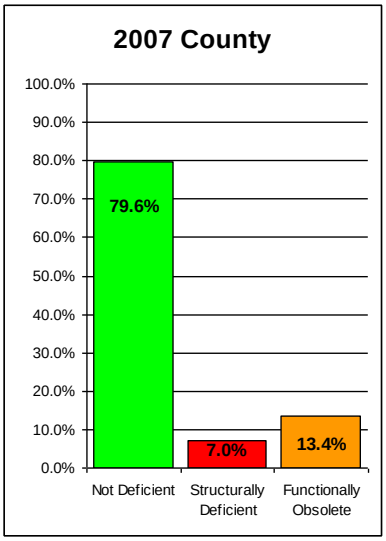
#	%	Bridge Category
169	12.0%	Structurally Deficient
354	25.1%	Functionally Obsolete
890	62.9%	Not Deficient
1,413		Total NBI Bridges
19	1.3%	High Priority Replacement
27	1.9%	High Priority Corrective Action
74	5.2%	Meets Minimum Tolerable Limits
716	50.7%	Carries National Highway System
272	19.2%	Carries Strahnet System
81.25		Sufficiency Rating (Average)
1964.5		Year Built (Average)
32,898		ADT (Average)
9.43%		% Trucks (Average)

The 2007 NBI reported that 1,413 bridges, 43.2% of bridges in the CMAP region, were owned by IDOT. The CMAP region consists of all of IDOT District 1, plus Kendall County and one township in Grundy County from District 3. The average IDOT bridge was built in 1964, with a 2007 average sufficiency rating of 81.3. A total of 169 IDOT bridges (12.0%) were classified as structurally deficient, and another 354 (25.1%) as functionally obsolete. Based on the structural evaluation field (NBI data item 67), there were 19 (1.3%) bridges identified as "high priority for replacement,"27 (1.9%) "high priority for corrective action," and another 74 (5.2%) bridges that "meet minimum tolerable limits to be left in place as is."

Major observations comparing IDOT owned bridges to other ownership categories include:

- The average IDOT bridge was built in 1964, which matched the regional average.
- The average bridge sufficiency rating was the 2nd worst for owners in the CMAP region.
- The IDOT rates for structurally deficient, functionally obsolete and for total deficient bridges were the 2nd worst in the CMAP region.
- IDOT bridges carried the 2nd highest ADT in the CMAP region.
- 60% of bridges that carry NHS routes, and 47% of bridges that carry expressway are owned by IDOT.

7.3 County



#	%	Bridge Category
28	7.0%	Structurally Deficient
54	13.4%	Functionally Obsolete
320	79.6%	Not Deficient
402		Total NBI Bridges
2	0.5%	High Priority Replacement
4	1.0%	High Priority Corrective Action
30	7.5%	Meets Minimum Tolerable Limits
52	12.9%	Carries National Highway System
-	0.0%	Carries Strahnet System

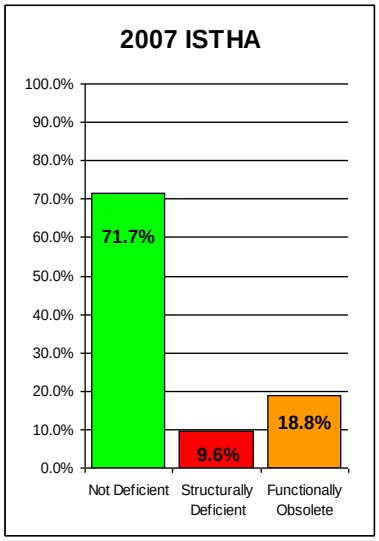
85.12	Sufficiency Rating (Average)
1970.9	Year Built (Average)
10,608	ADT (Average)
6.89%	% Trucks (Average)

The 2007 NBI reported that 402 bridges, 12.3% of bridges in the CMAP region, were owned by county DOTs. The average county DOT bridge was built in 1970, with a 2007 average sufficiency rating of 85.1. A total of 28 county bridges (7.0%) were classified as structurally deficient, and another 54 (13.4%) as functionally obsolete. Based on the structural evaluation field (NBI data item 67), there were 2 (0.5%) bridges identified as "high priority for replacement,"4 (1.0%) "high priority for corrective action," and another 30 (7.5%) bridges that "meet minimum tolerable limits to be left in place as is."

Major observations comparing county-owned bridges to other ownership categories include:

- The average county- owned bridge was built in 1970, which was the 2nd youngest of owners in the region.
- The average bridge sufficiency rating was the 2nd best of owners in the region.
- The county-owned rates for structurally deficient, functionally obsolete and for total deficient bridges were the 2nd best in the CMAP region.
- County-owned bridges carried the 2nd lowest ADT of owners in the region.

7.4 ISTHA



#	%	Bridge Category
30	9.6%	Structurally Deficient
59	18.8%	Functionally Obsolete
225	71.6%	Not Deficient
314		Total NBI Bridges
0	0.0%	High Priority Replacement
0	0.0%	High Priority Corrective Action
15	4.8%	Meets Minimum Tolerable Limits
280	89.2%	Carries National Highway System
277	88.2%	Carries Strahnet System

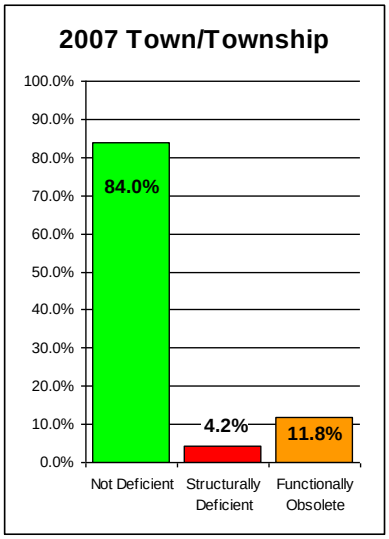
81.69	Sufficiency Rating (Average)
1961.6	Year Built (Average)
63,306	ADT (Average)
9.98%	% Trucks (Average)

The 2007 NBI reported that 314 bridges, 9.6% of bridges in the CMAP region, were owned by ISTHA. The average ISTHA bridge was built in 1961, with a 2007 average sufficiency rating of 81.7. A total of 30 ISTHA bridges (9.6%) were classified as structurally deficient, and another 59 (18.8%) as functionally obsolete. Based on the structural evaluation field (NBI data item 67), there were no bridges identified as "high priority for replacement," and no bridges for "high priority for corrective action." However, there were 15 (4.8%) bridges that did "meet minimum tolerable limits to be left in place as is."

Major observations comparing ISTHA-owned bridges to other ownership categories include:

- The average ISTHA-owned bridge was built in 1961, which was the 2nd oldest of owners in the region, 3 years older than the regional overage.
- The average bridge sufficiency rating was the median rating of owners in the region.
- The ISTHA-owned rates for structurally deficient, functionally obsolete and for total deficient bridges were the median for owners in the CMAP region.
- There were no ISTHA bridges were identified for HP replacement or HP corrective action.
- ISTHA-owned bridges carried the highest ADT in the CMAP region, almost double the average ADT for IDOT bridges.
- 23% of bridges that carry NHS routes, and 44% of bridges that carry expressway were owned by ISTHA.

7.5 Township



#	%	Bridge Category
16	4.2%	Structurally Deficient
45	11.8%	Functionally Obsolete
321	84.0%	Not Deficient
382		Total NBI Bridges
3	0.8%	High Priority Replacement
3	0.8%	High Priority Corrective Action
13	3.4%	Meets Minimum Tolerable Limits
-	0.0%	Carries National Highway System
-	0.0%	Carries Strahnet System

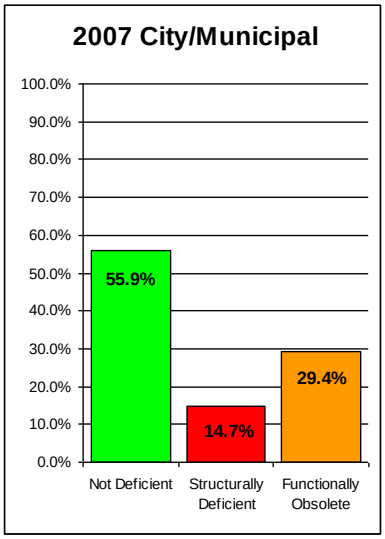
87.86	Sufficiency Rating (Average)
1971.9	Year Built (Average)
902	ADT (Average)
4.93%	% Trucks (Average)

The 2007 NBI reported that 382 bridges, 11.7% of bridges in the CMAP region, were owned by townships highway departments. The average township bridge was built in 1971, with a 2007 average sufficiency rating of 87.9. A total of 16 bridges (4.2%) were classified as structurally deficient, and another 45 (11.8%) as functionally obsolete. Based on the structural evaluation field (NBI data item 67), there were 3 (0.8%) bridges identified as "high priority for replacement,"3 (0.8%) for "high priority for corrective action," and another 13 (3.4%) bridges that "meet minimum tolerable limits to be left in place as is".

Major observations comparing township-owned bridges to other ownership categories include:

- The average township-owned was built in 1971, which was 7 years younger than the regional average.
- Bridge sufficiency ratings for township-owned bridges averaged the best for owners in the CMAP region.
- The township rates for structurally deficient, functionally obsolete and total deficient bridges were the lowest best of ownership categories in the CMAP region.
- Township-owned bridges carried the lowest ADT volumes for ownership categories in the CMAP region.

7.6 Municipal



#	%	Bridge Category
108	14.8%	Structurally Deficient
216	29.5%	Functionally Obsolete
408	55.7%	Not Deficient
732		Total NBI Bridges
12	1.6%	High Priority Replacement
17	2.3%	High Priority Corrective Action
68	9.3%	Meets Minimum Tolerable Limits
144	19.7%	Carries National Highway System
49	6.7%	Carries Strahnet System

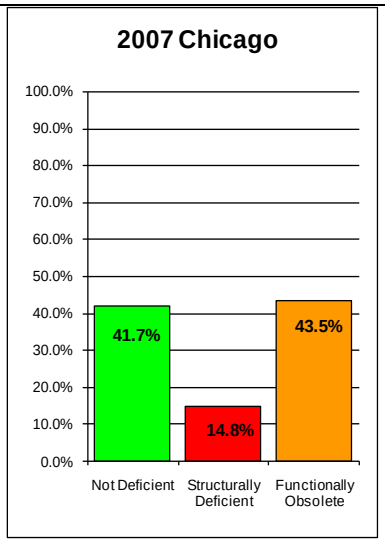
79.20	Sufficiency Rating (Average)
1958.1	Year Built (Average)
13,907	ADT (Average)
5.4%	% Trucks (Average)

The 2007 NBI reported that 732 bridges, 22.4% of bridges in the CMAP region, were owned by municipalities. The average municipal bridge was built in 1958, with a 2007 average sufficiency rating of 79.2. A total of 108 bridges (14.8%) were classified as structurally deficient, and another 216 (29.5%) as functionally obsolete. Based on the structural evaluation field (NBI data item 67), there were 12 (1.6%) bridges identified as "high priority for replacement,"17 (2.3%) "high priority for corrective action," and another 68 (9.3%) bridges that "meet minimum tolerable limits to be left in place as is."

Major observations comparing municipality-owned bridges to other ownership categories include:

- The average municipality-owned bridge was built in 1958, 6 years older than the regional average. At the ownership level, these bridges were the oldest in the region. Bridges owned by the City of Chicago will be discussed in a section 7.7.
- The average bridge sufficiency rating was the worst in the region. The average municipality-owned bridge met the sufficiency rating criteria for HBRRP funding eligibility.
- Municipality-owned rates for structurally deficient was the worst, functionally obsolete was the worst, and for total deficient bridges was the worst in the CMAP region. Almost 45% of these bridges were classified as deficient.
- Municipality-owned bridges carried the median ADT in the CMAP region.

7.7 City of Chicago



#	%	Bridge Category
42	14.8%	Structurally Deficient
123	43.5%	Functionally Obsolete
118	41.7%	Not Deficient
283		Total NBI Bridges
3	1.1%	High Priority Replacement
5	1.8%	High Priority Corrective Action
29	10.2%	Meets Minimum Tolerable Limits
134	47.3%	Carries National Highway System
49	17.3%	Carries Strahnet System

76.99	Sufficiency rating (Average)
1951.6	Year Built (Average)
28,226	ADT (Average)
9.10%	% Trucks (Average)

The 2007 NBI reported that 283 bridges, 8.6% of bridges in the CMAP region, were owned by City of Chicago. The average City of Chicago bridge was built in 1951, with a 2007 average sufficiency rating of 76.9. A total of 42 City of Chicago bridges (14.8%) were classified as structurally deficient, and another 123 (43.5%) as functionally obsolete. Based on the structural evaluation field (NBI data item 67), there were 3 (1.1%) bridges identified as "high priority for replacement,"5 (1.8%) "high priority for corrective action," and another 29 (10.2%) bridges that "meet minimum tolerable limits to be left in place as is."

Major observations comparing bridges owned by the City of Chicago compared to all ownership categories include:

- The average bridge owned by the City of Chicago was built in 1951, 13 years older than the regional average; and 7 years older than the average municipally-owned bridge. Of all ownership or geography levels reviewed in this report, City of Chicago-owned bridges were the oldest in the region.
- The average bridge sufficiency rating was the worst in the region. The average bridge owned by the City of Chicago met the sufficiency rating criteria for HBRRP funding eligibility. Of all ownership or geography level reviewed in this report, City of Chicago-owned bridges was the worst in the region.
- City of Chicago-owned rates for structurally deficient was the worst, functionally obsolete was the worst, and for total deficient bridges was the worst in the CMAP region. Almost 60% of these bridges were classified as deficient.
- City of Chicago-owned bridges carried the 3rd highest ADT in the CMAP region.

APPENDIX A

Exhibit A1: Structurally Deficient Bridges in the CMAP Region

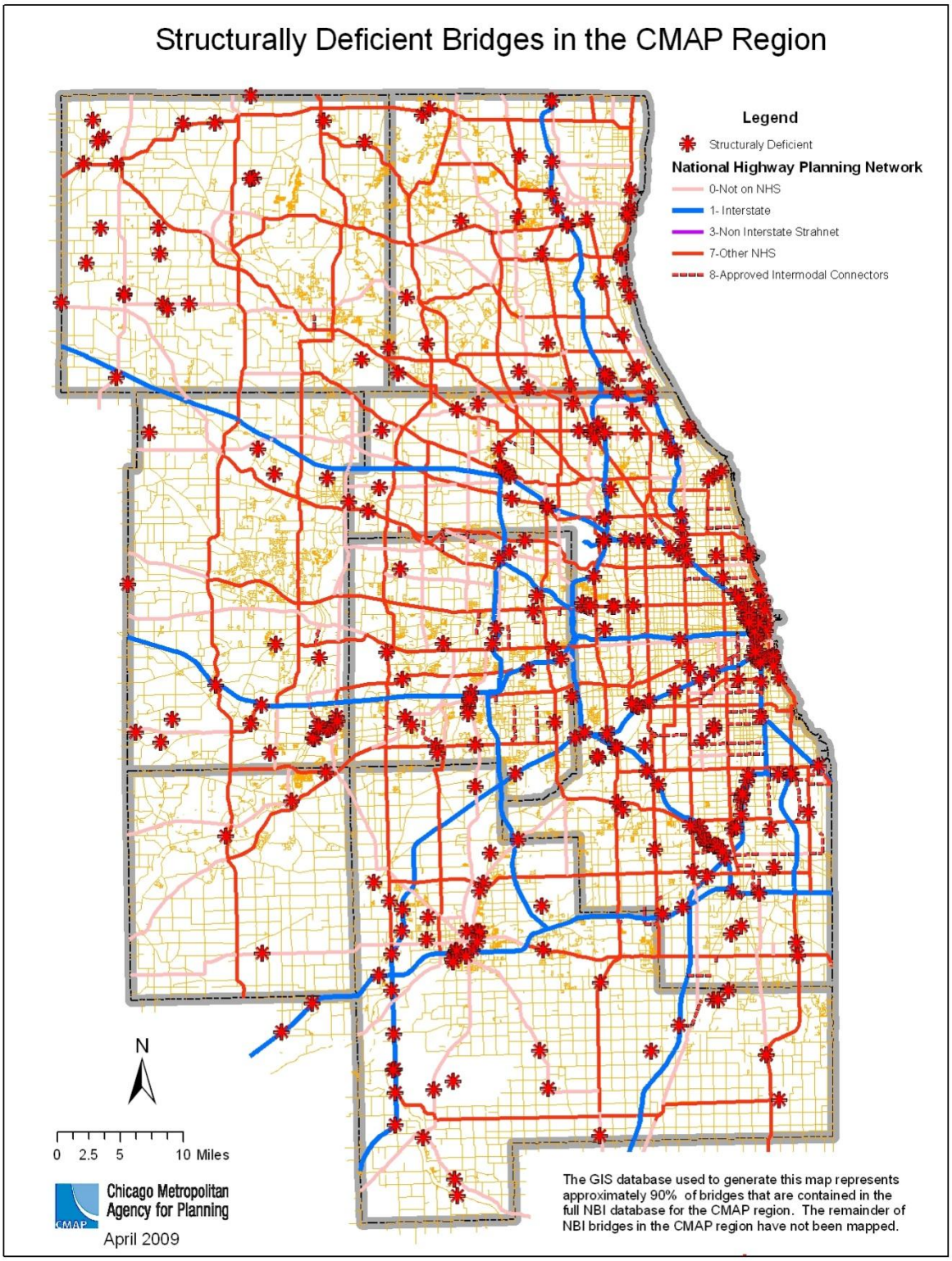


Exhibit A2: Functionally Obsolete Bridges in the CMAP Region

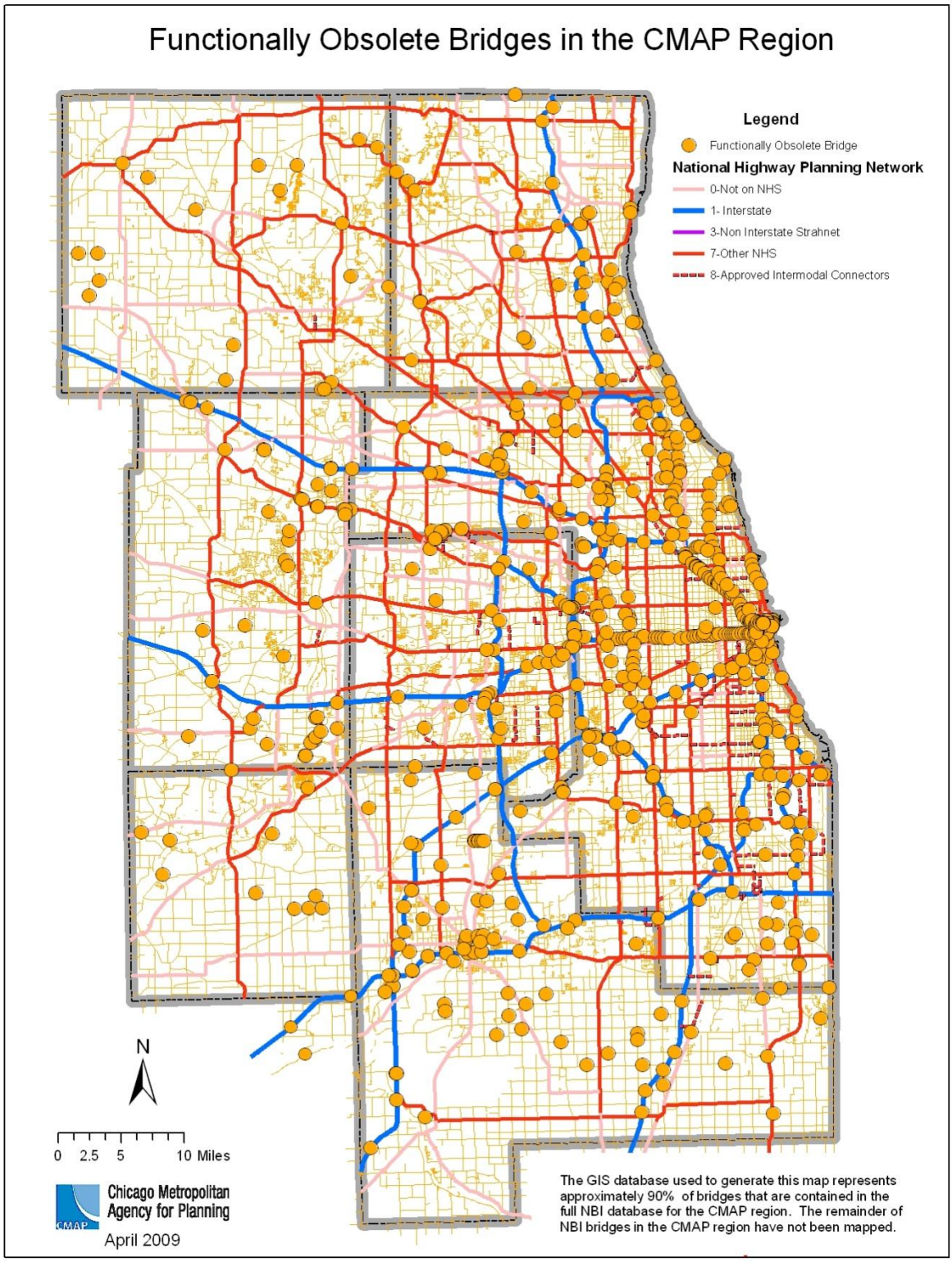


Exhibit A3: High Priority Bridges in the CMAP Region

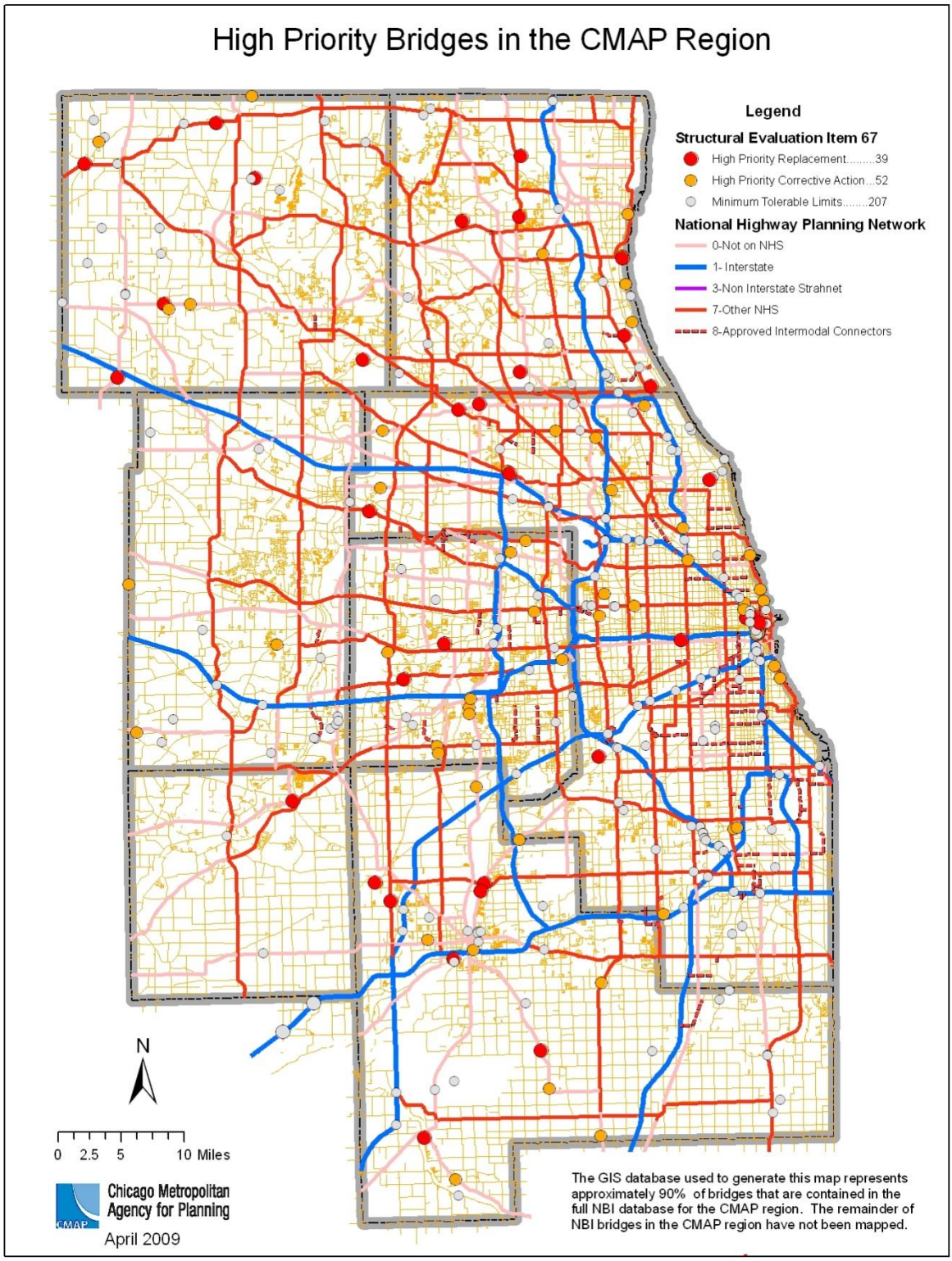


Exhibit A4: National Highway System Bridges in the CMAP Region

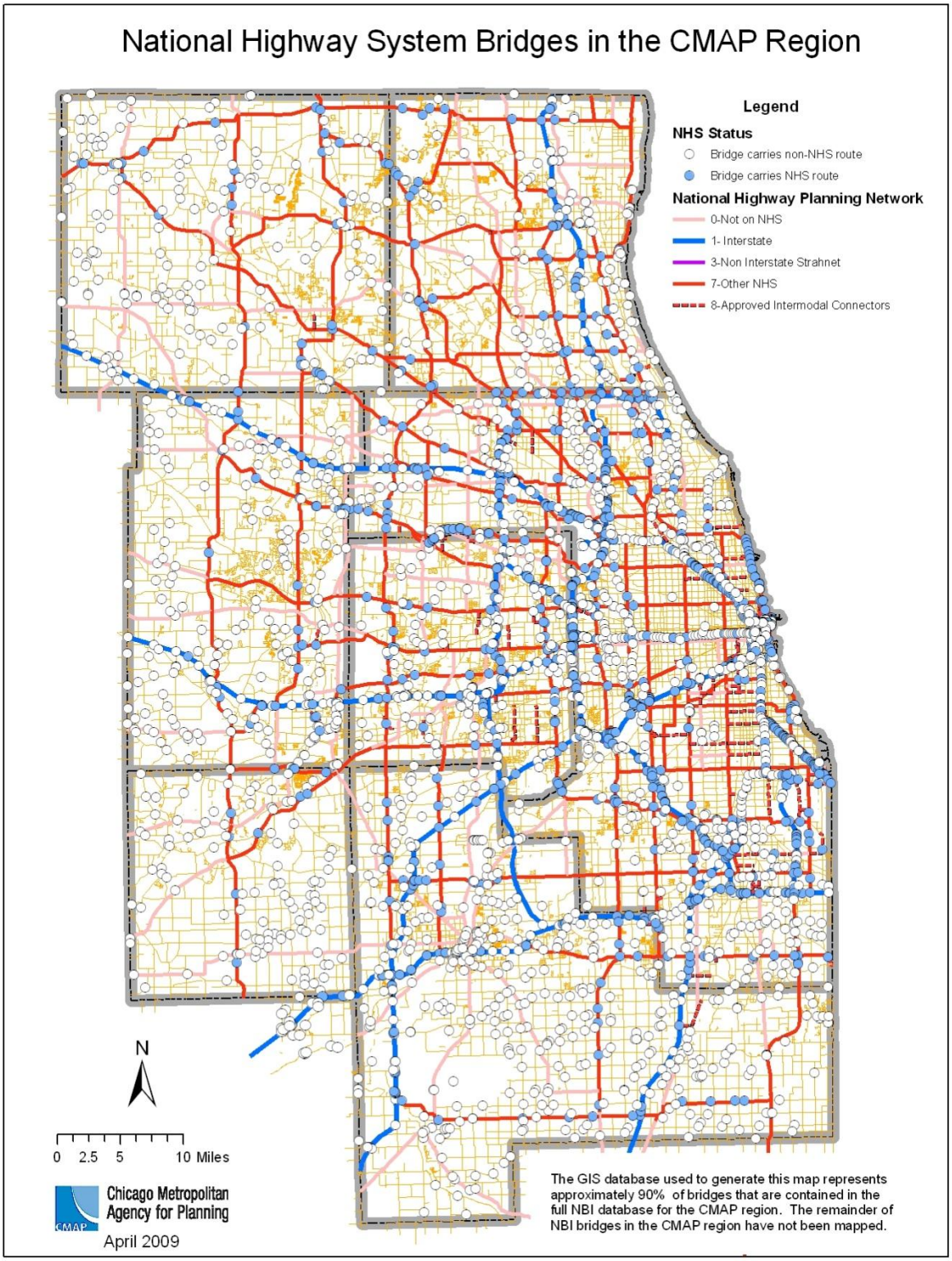


Exhibit A5: Historic Trends – National Highway System Bridge Conditions