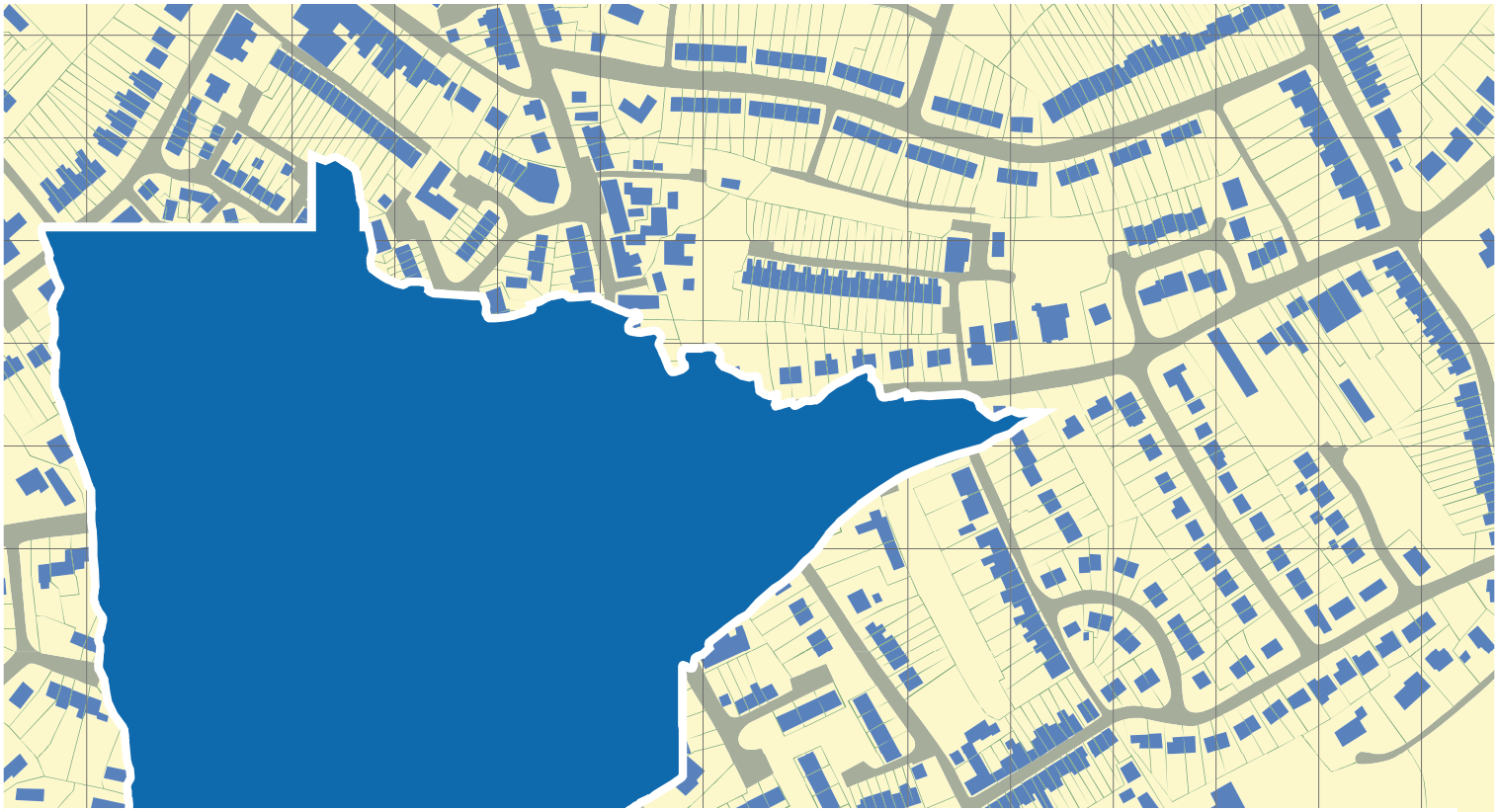

MN2050 | State of the Infrastructure

2015/2016 Survey

Key Findings and Recommendations

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Infrastructure planning, long term success

Minnesota Department of Transportation

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June 2016

PARTNERS

American Council of Engineering Companies of Minnesota (ACECMN)

Central States Water Environment Association

City Engineers Association of Minnesota (CEAM)

Metropolitan Airports Commission (MAC)

Minnesota Asphalt Pavement Association (MAPA)

Minnesota Chapter – APWA

Minnesota Council of Airports

Minnesota County Engineers Association (MCEA)

Minnesota Department of Transportation (MnDOT)

Minnesota Government Engineering Council (MGEC)

Minnesota Ports Association

Minnesota Rural Water Association (MRWA)

Minnesota Section – ASCE

Minnesota Section – AWWA

Minnesota Society of Professional Engineers

Minnesota Transportation Alliance

North-Central Section Institute of Transportation Engineers

MN2050 (mn2050.org) is a coalition of Minnesota engineering and public works organizations striving to educate citizens about the critical importance of investing in dependable infrastructure that will meet the needs of the 21st century.

The Minnesota Department of Transportation State Aid, at the request of MN2050, contracted with Wilder Research to complete a 'State of the Infrastructure' survey in 2015 and 2016 to gather information about the characteristics and management of Minnesota's city, county, and state infrastructure.

Minnesota engineers and public works professionals manage our infrastructure. These public assets include roads, bridges, transit, sewers, drinking water systems, waste water systems, traffic fixtures, storm ponds, buildings, airports, ports, railways, solid waste facilities, natural gas networks, parks, and fleet. Each of these assets has a lifecycle: it is planned, designed, constructed, maintained/operated, and replaced. Professional asset management measures each asset's characteristics in order to develop a strategy to extend an asset's useful life.

The study results reinforce that few local jurisdictions know the specific condition and value of their infrastructure and that no state level agency knows the aggregate characteristics of all of Minnesota's infrastructure. In addition, while there are many asset management approaches, there is little consistency in the tools and systems used by the state's asset managers.

The results of this survey will be used to better inform the public of the extent, condition, and value of our assets, and for professionals to consider best practices for managing them. The attached report includes an executive summary and the full report. For detailed responses to every survey question and a detailed description of the study methods check out the data book, which is located on the MN2050 website.

The widespread support that we have received from local, county, and state agencies indicates a strong commitment to good management of these critical public assets.

Respectfully,

Brad Henry and Tom Eggum, MN2050

Acknowledgements

Wilder Research would like to acknowledge our study partners from MN2050 and the Minnesota Department of Transportation (MnDOT) State Aid for their continued guidance throughout all phases of this study; their expertise and insight were and continue to be invaluable. MnDOT funded this study.

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Michael Thompson, City Engineers Association of Minnesota
Joel Ulring, MnDOT

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Finally, we would like to thank the 529 city and county engineers and other professionals who took the time to complete this survey in 2015 and/or 2016. Without them, this report would not be possible.

The following Wilder Research staff contributed to this study:

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MN2050 | State of the Infrastructure
2015/2016 Survey

Executive summary

The goals of the 'State of the Infrastructure' survey are: 1) to learn to what degree city, county, and state agencies are using asset management practices in Minnesota, and 2) to share collective knowledge regarding the wide range of infrastructure types in Minnesota and the characteristics of these infrastructure assets. In partnership with MN2050 and the Minnesota Department of Transportation (MnDOT), Wilder Research developed a survey that asked public works engineers and other professionals from jurisdictions around Minnesota about their asset management practices and their jurisdiction's infrastructure assets. This survey was first conducted in 2015 and revised in 2016. The list of jurisdictions was expanded to include more small cities for the 2016 administration.

The completed surveys for 2015 and 2016 combined include 316 smaller cities (45% of all small cities that were invited to complete the survey), 129 larger cities (87%), 82 counties (94%), and two state agencies, for a total of 529 respondents (56% overall response rate). (Responses from 79 jurisdictions from 2015 were included in the 2015/2016 analysis because they did not respond in 2016.)

Asset management is a relatively new strategic process of operating and maintaining physical infrastructure assets to extend their life. It is used to identify and structure a sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good service over the life cycle of the asset, at minimum practicable cost.

MINNESOTA KEY FINDING

Summary of key findings

- Just over half of Minnesota jurisdictions practice some form of asset management.
- Respondents identified multiple reasons for using asset management practices. The primary reason jurisdictions practice asset management is to preserve, maintain, and extend the life of infrastructure assets. Other reasons include budgeting, inventorying, and mapping infrastructure assets.

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- On a 5-point scale (with "1" being not very effective and "5" being very effective), 79% of respondents gave their jurisdiction a rating of 3 or lower.
- Cities and counties are managing all assets listed in the survey, while state agencies are managing fewer asset types. Public infrastructure assets include more than just roads, bridges, and transit lines. Minnesota's cities, counties, and state agencies manage many types of assets, including traffic fixtures, buildings, drinking water supply and distribution pipes, waste water collection and treatment facilities, storm sewers, storm ponds, airports, ports, railways, electrical systems, solid waste facilities, natural gas networks, parks, and fleet.
- The majority of jurisdictions in Minnesota do not know the value of the assets they manage. Less than one-third of respondents knew the value of any asset type, and for some infrastructure asset types the value was unknown by all respondents. Similarly, relatively few jurisdictions were able to report a dollar amount when they were asked to report the annual gap between infrastructure investment needs in their jurisdiction and available funds.
- It is difficult for jurisdictions to calculate the value of infrastructure assets due to a variety of factors that need to be considered and the various approaches that could be used for valuation; using common asset management practices would help jurisdictions to better, and more consistently, estimate the value of infrastructure. More research is needed to accurately estimate the value of Minnesota's infrastructure and the gap in funds needed to maintain, repair, and replace it.
- In all, over 100 different systems and tools are being used across the jurisdictions that participated in this survey to manage their different types of infrastructure assets. The most commonly used specialized software systems include MnDOT SIMS, Icon, Simple Signs, Pontis, and Cartegraph.

Recommendations

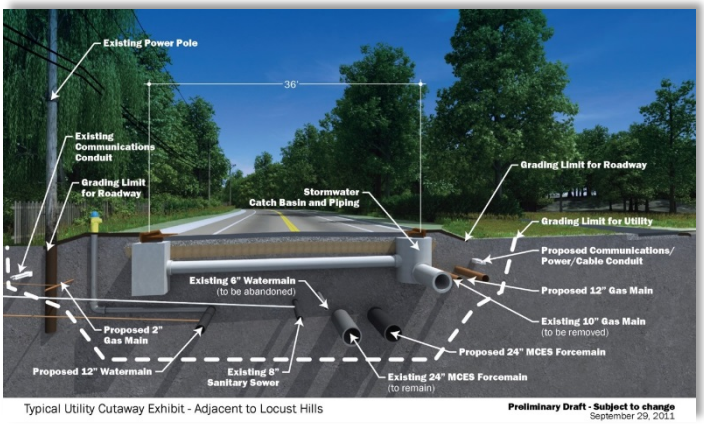
- Make resources available, especially for smaller cities and smaller counties, to implement an asset management system.
- Host conferences, training sessions, webinars, or other forms of education to help those who want to begin or strengthen asset management practices in their jurisdictions.
- Consider advocating for the use of a few select, easy-to-use asset management systems, rather than many different systems, to promote consistency, collaboration, and capacity across jurisdictions.
- Facilitate the building of relationships with neighboring jurisdictions and consortiums to build regional capacity for using asset management practices and systems.
- Explore public policy solutions that could make asset management a standard practice for every jurisdiction.
- More research is needed to understand how to best support Minnesota's cities, counties, and state agencies in their use of asset management practices and systems.

Introduction

In partnership with MN2050, Wilder Research conducted an online survey in 2015 and again in 2016 for the Minnesota Department of Transportation (MnDOT) State Aid. Survey respondents included engineers and other personnel from 529 jurisdictions across Minnesota, including cities, counties, and two state agencies: Metropolitan Council and MnDOT.

The goals of the State of the Infrastructure survey are: 1) to learn to what degree city, county, and state agencies are using asset management practices in Minnesota, and 2) to share collective knowledge regarding the wide range of infrastructure types in Minnesota, and the characteristics and condition of these infrastructure assets. Survey findings in this report and in the detailed 'Data Book' can be used by Engineering/Public Works departments to identify and implement good asset management practices. Findings can also be used to guide policymakers, as well as the general public, in making appropriate investments toward the proper management of public infrastructure. With the results of this survey, we attempted to roughly estimate the per capita value of Minnesota's infrastructure assets and the gap between infrastructure funding and need.

The survey was designed by Wilder Research and MN2050 with input from MnDOT State Aid. Web surveys were emailed to the public works engineer or general contact for each jurisdiction in early summer of 2015 and early spring of 2016. Based on information we obtained in 2015, the survey instrument was revised for 2016 to better address the research questions. The 2016 survey was also sent to a more complete sample of smaller cities in Minnesota. In both 2015 and 2016, Wilder Research administered the survey and compiled and analyzed the responses.

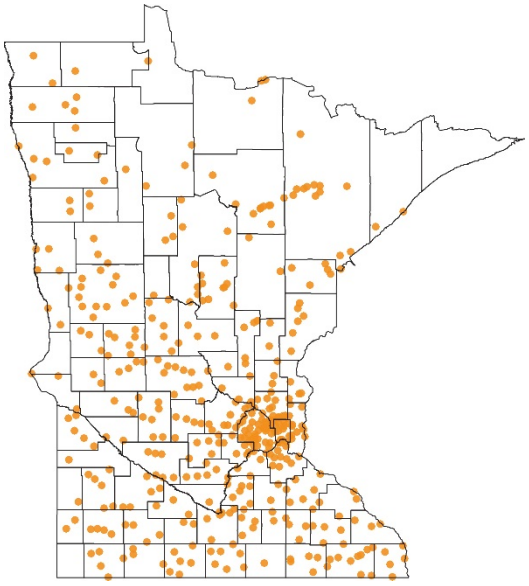


Hennepin County road and infrastructure
Photo courtesy of AECOM

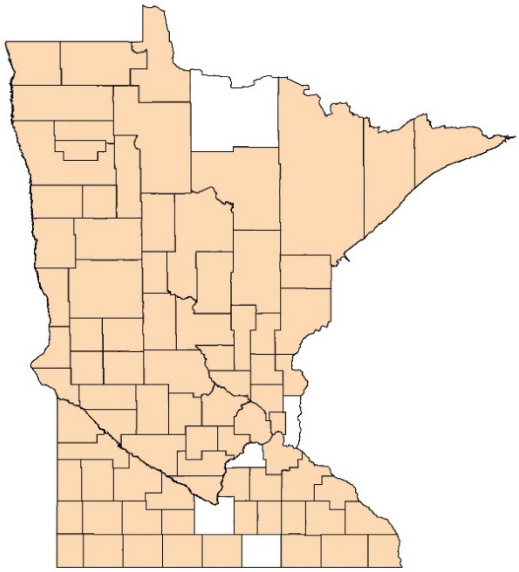
The completed surveys for 2015 and 2016 combined include 316 smaller cities (45% of all small cities that were invited to participate), 129 larger cities (87%), 82 counties (94%), and both state agencies that were invited, for a total of 529 respondents (56% overall response rate). Responses from 79 jurisdictions from 2015 were included in the 2015/2016 analysis because they did not respond in 2016. Not all respondents answered every question, which is why the number of respondents (N) changes throughout the report. See the map on the following page that shows which jurisdictions participated in the survey, and see pages 23-24 for more information about the study sample and methodology.

Cities and counties that participated in the survey*

Cities



Counties

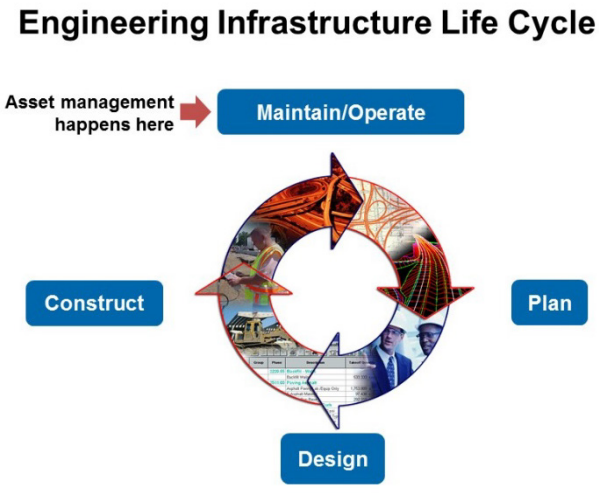


**445 cities and 82 counties completed the survey. Two state agencies, MnDOT and Metropolitan Council (not included on maps) also completed the survey.*

What is asset management and why is it important?

Infrastructure has a life cycle: It is planned, designed, built, maintained/operated, and eventually replaced. Asset management is a strategic process during the maintenance and operation phase to measure the age, value, and condition of a physical asset in order to develop a cost-effective strategy to sustainably extend the useful life of that asset and determine replacement cost. Asset management tools and systems help to keep track of these variables, with the ultimate goal of minimizing total cost over the life cycle of an asset.

Infrastructure has a life cycle, and asset management is an important part of that cycle.



According to MN2050, infrastructure is important because it supports Minnesota's economy. In addition, well-planned infrastructure improves safety, security, and comfort. Infrastructure is also expensive, with additional costs incurred during the maintenance and operation stage. Asset management improves our infrastructure, which directly impacts the economic sustainability and quality of life in Minnesota.

Key findings

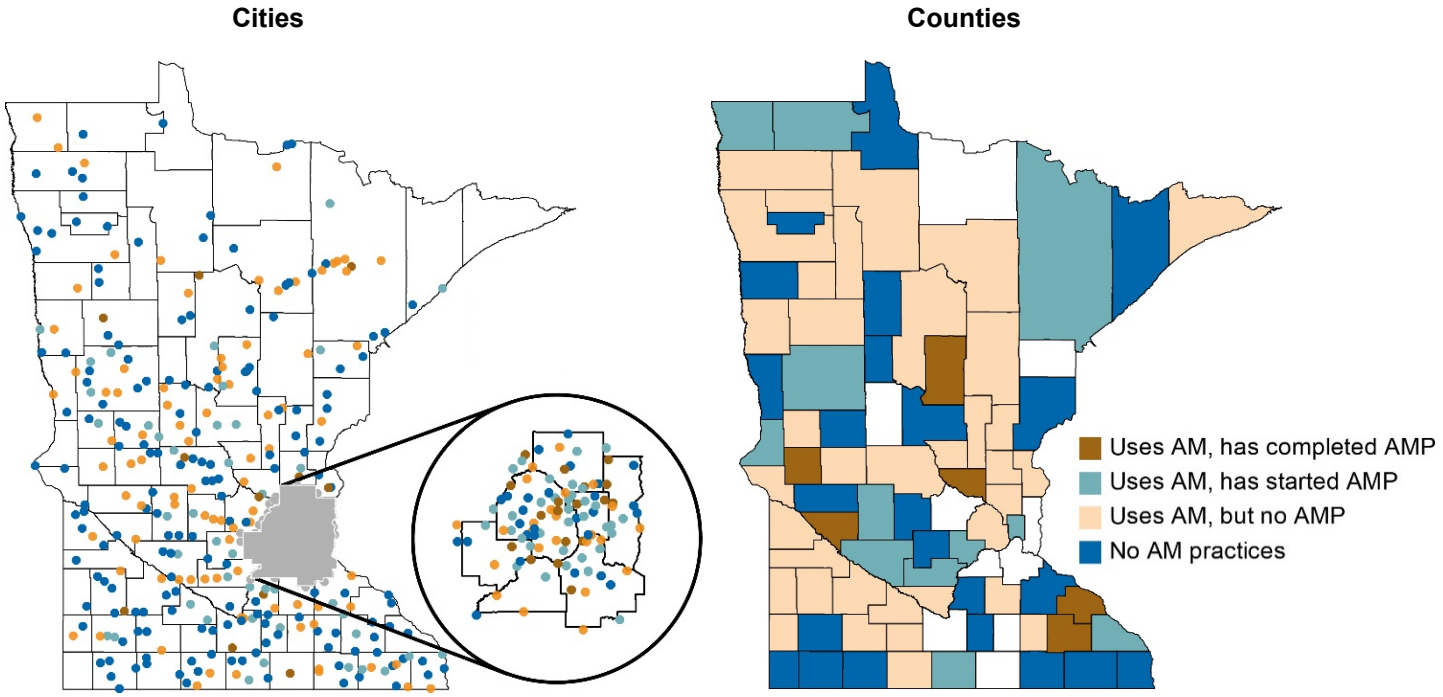
MINNESOTA KEY FINDING

Just over half of Minnesota jurisdictions practice some form of asset management

Over half (58%) of survey respondents said they use asset management practices to operate, maintain, and extend the life of infrastructure assets in their jurisdiction (44% of smaller cities, 82% of larger cities, and 72% of counties). Although the majority of jurisdictions practice some form of asset management, only 13 percent of those who practice asset management have completed an Asset Management Plan (AMP) (9% of smaller cities, 18% of larger cities, 11% of counties, one state agency). One-third (33%) of jurisdictions have started an AMP, but have not completed it.

An AMP is a tool used to manage an agency's infrastructure to an agreed standard of service. It establishes a consistent approach to planning, programming, and managing assets.

Cities and counties that use asset management practices and have an Asset Management Plan*

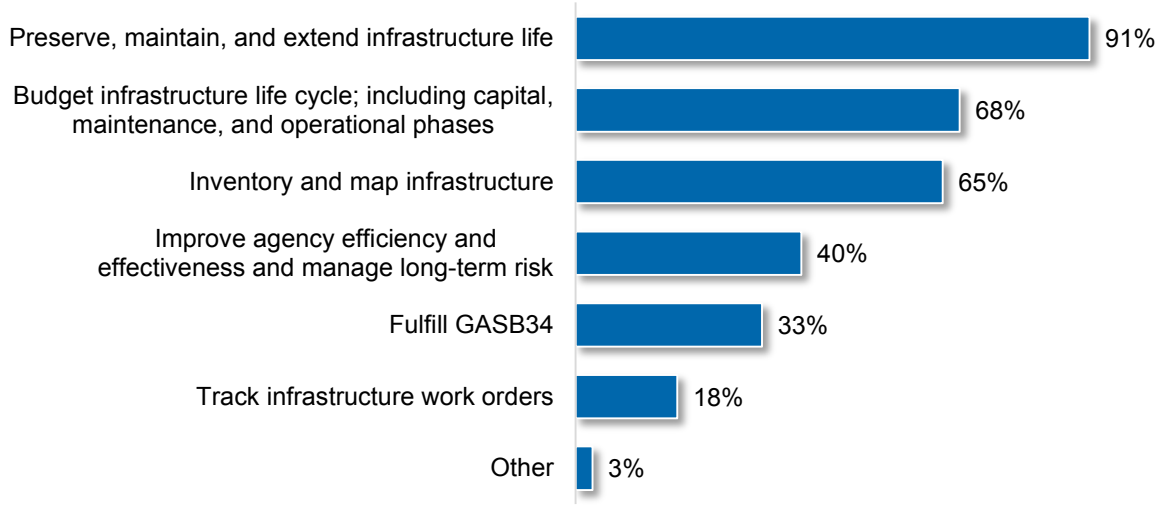


**443 cities and 81 counties answered this question. Both state agencies practice asset management (not shown on map). One has completed an AMP and one has started a plan, but it is not completed.*

The primary reason jurisdictions practice asset management is to preserve, maintain, and extend the life of infrastructure

Among the jurisdictions in Minnesota that are practicing asset management, the most common reasons for practicing asset management are to: 1) preserve, maintain, and extend the life of infrastructure; 2) budget infrastructure life cycle, including capital, maintenance, and operational phases; and 3) inventory and map infrastructure. See the chart below for top reasons jurisdictions practice asset management.

Top reasons for practicing asset management*



250 survey respondents answered this question.

Resource constraints are the primary reason jurisdictions do not practice asset management

Respondents who said their jurisdiction does not practice asset management were asked an open-ended question about the main reasons why their jurisdiction does not practice asset management. Their top reasons include:

1. Resource constraints such as limited funds and inadequate staffing

> *"Our jurisdiction has a lack of historic information/access to conditions to accurately project forward future conditions. However, we are gathering more information to improve this in the future. Additionally, limited staff availability and budget constraints limit efforts with actively managing/updating programs."*
>
> *"Lack of resources to set up and maintain that type of system."*
>
> *"[Small city] has only two full-time staff people and two seasonal part-time staff to help with parks in the summer. The City uses consultants to provide guidance on asset maintenance and contractors to complete the work. The City is not likely to be interested in spending more money on consultants to do more asset management than they are doing now."*

2. Small jurisdiction

> *"[County] is not a large enough county to justify an asset management system. We manage our infrastructure and equipment in-house."*
>
> *"Size of the community does not warrant the use of this level of sophistication. Decisions can be made based on knowledge of the staff of the system."*

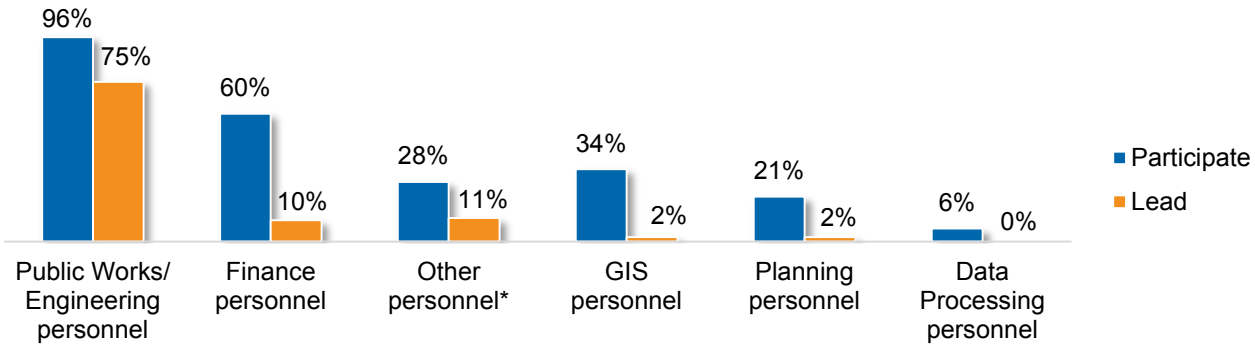
3. Lack of time

> *"Size and population, hours of time to maintain, available hours to do work, how many full-time and part-time employees, how much money is available/budgeted, training time for councils to understand the value asset management. This is small a town."*
>
> *"The amount of time it takes to develop the program."*

While many different professionals participate in asset management, Engineering/Public Works staff generally lead it

Of all different types of professionals, Engineering/Public Works and Finance personnel most commonly participate in and lead asset management for their organizations; GIS, Planning, and Data Processing personnel sometimes participate in the process.

Types of staff who participate at any level in asset management**



**Other personnel that participate in asset management include Administration, City Council and Clerk, Streets, Utilities, Maintenance, and Parks. Other departments that lead asset management include Administration, City Council, Clerk, Manager, and individually assigned departments for each asset type.*

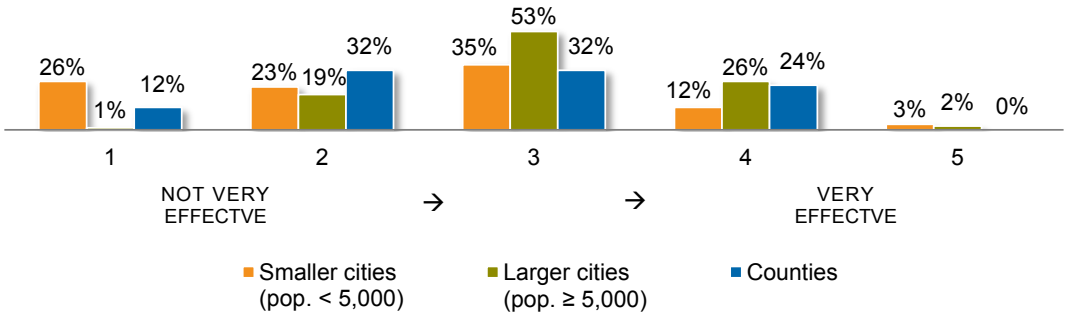
***298 survey respondents answered the question about who participates and 295 survey respondents answered the question about who leads asset management.*

Although one out of five jurisdictions rate their current asset management practices as effective, most gave an effectiveness rating of 3 or lower

On a 5-point scale (with "1" = "not very effective" and "5" = "very effective"), 79 percent of respondents gave their jurisdiction a rating of 3 or lower, indicating that most respondents see room for improvement in how their jurisdiction practices asset management.

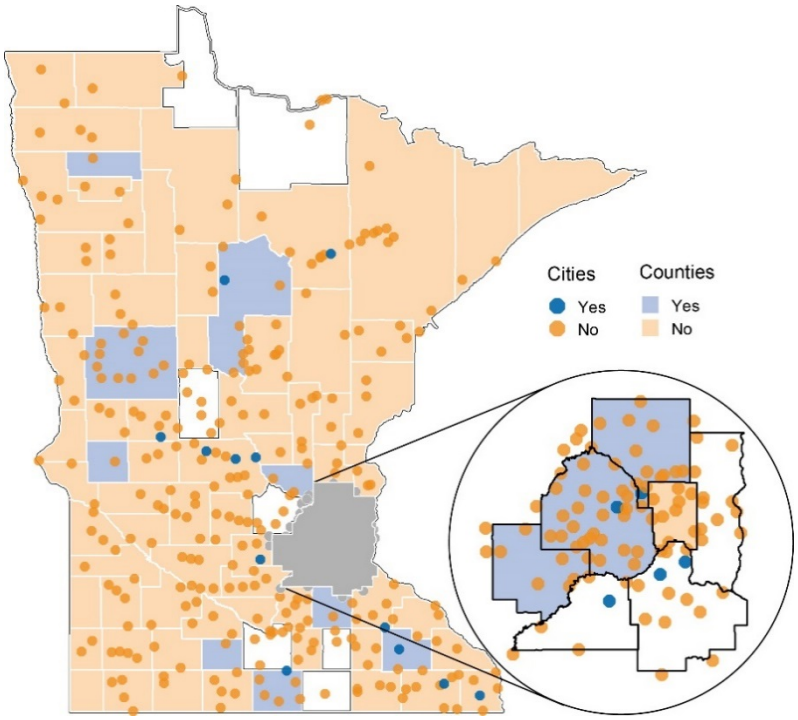
Smaller cities and counties were more likely than larger cities to rate their agency's current practices as less effective. Forty-nine percent of smaller cities and 44 percent of counties gave a rating of 1 or 2, compared with 20 percent of larger cities. See chart below for effectiveness ratings by jurisdiction type.

Respondents' ratings of their jurisdiction's asset management practices overall*



447 survey respondents answered this question.

Jurisdictions that participate in an asset management consortium*



Six percent of respondents indicate that their jurisdiction participates in an asset management consortium (3% of smaller cities, 7% of larger cities, and 16% of counties). See map on the left for information about which jurisdictions participate in an asset management consortium.

Of all jurisdictions that participate in an asset management consortium, 83 percent share electronic base maps (property aerials, planimetrics, and topos), 35 percent share asset management systems, and 24 percent share personnel.

479 survey respondents answered this question. Both state agencies participate in an Asset Management consortium (not shown on map).

Cities and counties are managing all infrastructure assets types listed in the survey, while state agencies are managing fewer asset types

There are a wide variety of infrastructure asset types managed by jurisdictions in Minnesota. The state agencies that participated in the survey, however, manage fewer types of infrastructure assets than the other jurisdictions as a whole. See the table below which shows which of the different asset types listed in the survey are managed by each type of jurisdiction.

Percent of each type of jurisdiction that has each type of infrastructure asset*

	Smaller cities (pop. < 5,000)	Larger cities (pop. ≥ 5,000)	Counties	State agencies
Roads	96%	98%	99%	100%
Bridges	19%	60%	100%	50%
Transit lines	2%	7%	5%	50%
Traffic fixtures	59%	86%	78%	100%
Buildings	86%	82%	86%	100%
Water supply and distribution pipes	87%	92%	6%	0%
Waste water collection and treatment	91%	98%	5%	100%
Storm sewers	87%	99%	72%	50%
Storm ponds	46%	95%	42%	100%
Airports	14%	24%	15%	0%
Ports	1%	2%	3%	0%
Railways	9%	7%	10%	50%
Electrical systems	23%	39%	14%	50%
Solid waste facilities	10%	9%	31%	0%
Natural gas networks	14%	8%	8%	0%
Parks	82%	90%	59%	0%
Fleet	29%	78%	79%	100%
Total number of asset types managed	**17**	**17**	**17**	**11**

**A range of 233-279 smaller cities, 104-121 larger cities, 71-78 counties, and two state agencies questions about infrastructure asset types.*

Storm pond
Photo courtesy of City of Maplewood

The percentage of jurisdictions in Minnesota that map, know the value of, and track information about infrastructure assets varies greatly across jurisdiction type as well as asset type

Survey respondents were asked what they track and know about the infrastructure assets in their jurisdiction. If respondents indicated that they have a particular type of infrastructure asset in their jurisdiction, they were asked:

- Whether the asset is mapped
- Whether they know the value of that asset
- What the value of these assets are
- Whether they know the condition, age, material, and size of that asset
- What other information, if any, about that asset is included in their asset inventory

The infrastructure assets most likely to be fully mapped were airports (84%), roads (82%), water supply and distribution pipes (82%), waste water collection and treatment facilities (78%), and bridges (77%). The assets that were least likely to be mapped were buildings (31%), ports (25%), traffic fixtures (24%), and fleet (19%). Nearly all larger cities (95%) have roads fully mapped, whereas 75 percent of smaller cities have their roads fully mapped.

If respondents reported that they map an infrastructure asset type they were asked which software is used. The type of software used for mapping assets depends on the type of asset. Many jurisdictions map their assets by using GIS and CAD; however, several assets are mapped using CAD only or GIS only.

Port

Photo courtesy of Duluth Seaway Port Authority

Asset management practices of jurisdictions in Minnesota by infrastructure type

Shading key: Green = 50% + | Orange = 25% - 49% | Pink = 0% - 24%

Asset	Jurisdiction	N	% with asset	Mapped	Inventoried: Value	Inventoried: Condition	Inventoried: Age	Inventoried: Material	Inventoried: Size	Use an asset management system
Roads	Smaller cities	279	96%	75%	7%	59%	48%	46%	47%	8%
	Larger cities	121	98%	95%	28%	82%	83%	82%	84%	61%
	Counties	78	99%	87%	27%	86%	95%	86%	70%	59%
Bridges	Smaller cities	279	19%	60%	13%	51%	40%	28%	36%	6%
	Larger cities	121	60%	81%	17%	83%	85%	69%	83%	40%
	Counties	78	100%	83%	24%	97%	96%	92%	91%	88%
Transit lines	Smaller cities	279	2%	20%	20%	20%	0%	0%	0%	40%
	Larger cities	121	7%	57%	0%	0%	33%	33%	33%	25%
	Counties	78	5%	0%	0%	33%	33%	0%	33%	0%
Traffic fixtures	Smaller cities	279	59%	12%	4%	32%	20%	16%	13%	7%
	Larger cities	121	86%	38%	8%	45%	62%	51%	44%	38%
	Counties	78	78%	34%	5%	60%	83%	67%	72%	59%
Buildings	Smaller cities	279	86%	28%	24%	35%	41%	21%	33%	5%
	Larger cities	121	82%	44%	20%	38%	58%	33%	46%	14%
	Counties	78	86%	21%	30%	28%	59%	26%	43%	9%
Water supply and distribution pipes	Smaller cities	279	87%	76%	9%	44%	62%	61%	72%	8%
	Larger cities	121	92%	98%	27%	34%	87%	96%	96%	37%
	Counties	78	6%	20%	25%	50%	50%	50%	50%	0%

Shading key:	Green = 50% +	Orange = 25% - 49%	Pink = 0% - 24%

Asset	Jurisdiction	N	% with asset	Mapped	Inventoried					Use an asset management system
					Value	Condition	Age	Material	Size	
Waste water collection and treatment	Smaller cities	279	91%	71%	11%	52%	64%	61%	72%	6%
	Larger cities	121	98%	94%	26%	56%	88%	96%	98%	36%
	Counties	78	5%	33%	33%	0%	67%	67%	67%	0%
Storm sewers	Smaller cities	279	87%	47%	5%	36%	41%	48%	60%	5%
	Larger cities	121	99%	85%	22%	40%	69%	89%	97%	35%
	Counties	78	72%	6%	0%	19%	42%	51%	51%	11%
Storm ponds	Smaller cities	279	46%	60%	7%	36%	47%	25%	47%	5%
	Larger cities	121	95%	75%	7%	53%	58%	35%	77%	36%
	Counties	78	42%	13%	0%	10%	26%	13%	32%	7%
Airports	Smaller cities	279	14%	81%	11%	58%	61%	47%	56%	17%
	Larger cities	121	24%	90%	17%	76%	79%	66%	69%	8%
	Counties	78	15%	80%	0%	33%	44%	22%	33%	0%
Ports	Smaller cities	279	1%	25%	0%	25%	50%	0%	25%	0%
	Larger cities	121	2%	50%	0%	0%	0%	0%	0%	100%
	Counties	78	3%	0%	0%	50%	0%	50%	0%	0%
Railways	Smaller cities	279	9%	36%	0%	8%	4%	0%	0%	0%
	Larger cities	121	7%	50%	0%	0%	0%	0%	0%	14%
	Counties	78	10%	57%	14%	14%	14%	29%	14%	20%

Shading key: Green = 50% + | Orange = 25% - 49% | Pink = 0% - 24%

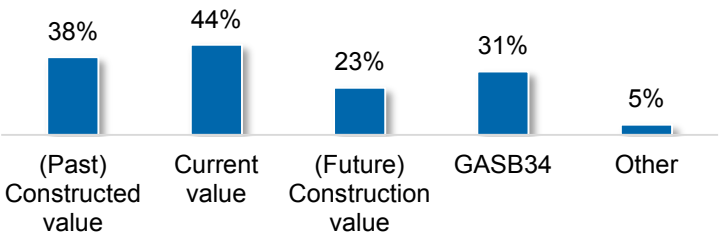
Asset	Jurisdiction	N	% with asset	Mapped	Inventoried: Value	Inventoried: Condition	Inventoried: Age	Inventoried: Material	Inventoried: Size	Use an asset management system
Electrical systems	Smaller cities	279	23%	41%	3%	36%	34%	40%	43%	13%
	Larger cities	121	39%	69%	7%	32%	56%	68%	68%	20%
	Counties	78	14%	33%	0%	0%	22%	33%	22%	13%
Solid waste facilities	Smaller cities	279	10%	35%	8%	40%	44%	36%	40%	5%
	Larger cities	121	9%	60%	20%	30%	60%	50%	60%	10%
	Counties	78	31%	35%	9%	18%	41%	23%	41%	6%
Natural gas network	Smaller cities	279	14%	51%	11%	11%	22%	27%	27%	3%
	Larger cities	121	8%	63%	0%	25%	25%	38%	38%	0%
	Counties	78	8%	20%	0%	0%	0%	0%	0%	0%
Parks	Smaller cities	233	82%	48%	7%	49%	32%	33%	40%	5%
	Larger cities	104	90%	67%	6%	43%	48%	43%	70%	23%
	Counties	71	59%	43%	15%	13%	28%	20%	53%	3%
Fleet	Smaller cities	233	29%	14%	18%	54%	62%	29%	49%	3%
	Larger cities	104	78%	24%	26%	71%	89%	45%	68%	31%
	Counties	71	79%	19%	37%	46%	91%	46%	67%	22%

Smaller cities (pop. < 5,000), Larger cities (pop. ≥ 5,000)

Little is known about the current value of infrastructure assets in Minnesota

Jurisdictions calculate the value of their assets in a variety of ways, often using more than one approach. The greatest proportion of jurisdictions (44%) said they estimate the "current value" of their assets rather than the value in the "past (constructed value)" or the estimated value as a "future build (construction value)." Nearly one-third of respondents said they value their assets using "GASB34." GASB34 is a standard for reporting basic financial statements for governmental use, set by the Governmental Accounting Standards Board. (GASB34 uses a depreciation approach to value an infrastructure based on the original construction price and the lifespan, so a sewer line built in 1986 for $1 million with a lifespan of 50 years depreciates at $20,000 per year and is valued at $400,000 in 2016.)

How jurisdictions in Minnesota value their infrastructure*



**423 survey respondents answered this question.*

Utilities under proposed LRT
Photo courtesy of AECOM

Important Note: The majority of jurisdictions do not know the value of the assets they manage. When asked about the value of each infrastructure type in their jurisdiction, more than two-thirds of respondents could not estimate the value. It is difficult for jurisdictions to calculate the value of infrastructure assets due to a variety of factors that need to be considered and the various approaches that could be used for valuation; using common asset management practices would help jurisdictions to more consistently estimate the value of infrastructure. The results of this survey strongly demonstrate that jurisdictions have not adopted a standard methodology to track and report the value of their infrastructure. Thus, no reliable formula exists to estimate Minnesota's total infrastructure value, or the gap in funding needed to maintain, repair, and replace it. In an attempt to use these survey results to increase our understanding of the value of Minnesota's infrastructure, the chart on the next page shows reported infrastructure value by type on a per capita basis for small cities, large cities, counties, and state agencies. Only a small proportion of all jurisdictions in Minnesota estimated the value of each infrastructure asset type in their particular jurisdiction, and as shown above, they use different methods to estimate the value. Based on this very limited data, we calculated the per capita value of each asset by jurisdiction type. Some per capita estimates differ greatly among different types of jurisdictions. So, while these estimates provide some useful insights, readers should exercise caution in interpreting the figures.

According to these rough estimates, roads have the highest per capita value across jurisdiction types, particularly for smaller cities. Buildings, waste water collection and treatment, water supply and distribution pipes, and electrical systems also have a relatively high per capita value.

Reported per capita values of infrastructure asset types*

	Smaller cities		Larger cities		Counties		State agencies	
	% who reported a value**	Value per capita	% who reported a value**	Value per capita	% who reported a value**	Value per capita	% who reported a value**	Value per capita
Roads	4%	$7,341	22%	$2,605	21%	$1,192	50%	$5,380
Bridges	2%	$766	7%	$402	18%	$338	50%	$1,209
Transit lines	0%	$1,456	0	NA	0%	NA	0%	NA
Traffic fixtures	2%	$4	4%	$40	5%	$13	0%	NA
Buildings	16%	$6,178	12%	$1,024	17%	$979	50%	$92
Water supply and distribution pipes	5%	$2,647	18%	$1,589	1%	$591	0%	NA
Waste water collection and treatment	7%	$3,543	19%	$1,571	1%	$828	50%	$1,191
Storm sewers	2%	$970	15%	$958	0%	NA	0%	NA
Storm ponds	1%	$195	6%	$57	0%	NA	0%	NA
Airports	1%	$2,287	2%	$441	0%	NA	0%	NA
Ports	0%	NA	0%	NA	0%	NA	0%	NA
Railways	0%	NA	0%	NA	1%	$581	0%	NA
Electrical systems	1%	$2,779	2%	$906	0%	NA	0%	NA
Solid waste facilities	1%	$295	2%	$20	1%	$305	0%	NA
Natural gas networks	1%	$1,455	0%	NA	0%	NA	0%	NA
Parks	3%	$417	3%	$886	5%	$146	0%	NA
Fleet	3%	$779	9%	$351	16%	$167	0%	NA

Smaller cities (pop. < 5,000), Larger cities (pop. ≥ 5,000)

**It is unknown how the values were calculated by each respondent (i.e., past, constructed, future, GASB34)*

***Calculated using 2015/2016 number of survey completes as the denominator and number of respondents who provided a value as numerator*

Culvert repair

Photo courtesy of MnDOT State Aid

There is a substantial annual gap between infrastructure investment needs and available funds

Survey participants were asked about the gap between their jurisdiction's annual infrastructure investment needs and available funds. The total estimates below are based on a sum of responses from a limited number of jurisdictions that answered this question on the survey: 71 percent of smaller cities, 62 percent of all larger cities, 74 percent of all counties, and two state agencies in Minnesota. The percent who reported the value is out of the number of survey completes for each jurisdiction type.

Reported sum of gap between annual infrastructure investment needs and available funds*

Smaller cities		Larger cities		Counties		State agencies	
% who reported a value**	Estimate of total gap in funding	% who reported a value**	Estimate of total gap in funding	% who reported a value**	Estimate of total gap in funding	% who reported a value**	Estimate of total gap in funding
71%	$228,453,751	62%	$360,652,000	74%	$501,333,586	100%	$750,000,000

Smaller cities (pop. < 5,000), Larger cities (pop. ≥ 5,000)

**It should be noted that the "gap" may be defined differently by each jurisdiction.*

***Calculated using 2015/2016 number of survey completes as the denominator and number of respondents who provided a value as numerator*

MINNESOTA KEY FINDING

Over 100 different asset management tools and systems are used in Minnesota

Many agencies conducting asset management use basic tools, including MS Excel, ESRI GIS, and pencil and paper. Agencies across Minnesota also use a wide variety of systems intended specifically for asset management. The most commonly used asset management systems include MnDOT SIMS, Icon, Simple Signs, Pontis, and Cartegraph. In total, over 100 different asset management systems and tools are used in Minnesota. In fact, there are 65 different tools or systems that are used by fewer than five jurisdictions each. For a complete list of tools and systems used by survey respondents, see the 'Data Book'.

Sewer reconstruction project

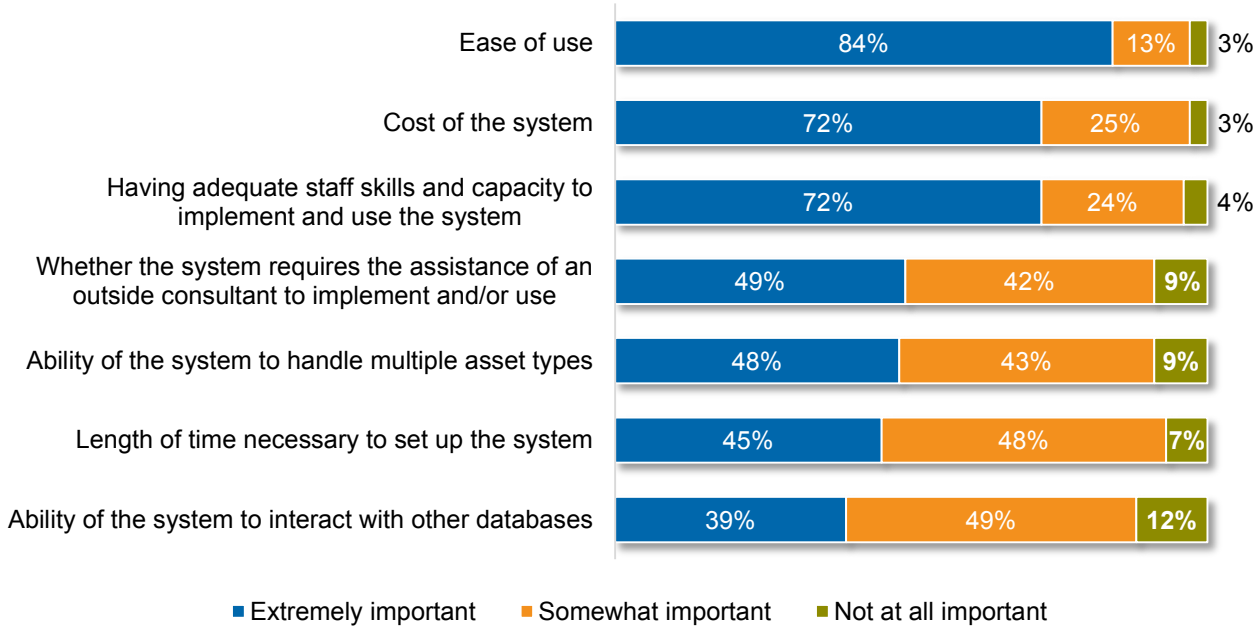
Photo courtesy of City of Maplewood

One-third (32%) of all jurisdictions that participated in the survey do not use any asset management tool or system. One-third (33%) use 1-2 different tools and systems across all infrastructure types, 21 percent use 3-5 different tools and systems, and 14 percent use six or more different tools and systems.

When asked about their goals regarding asset management systems, 35 percent said their goal is to have one asset management system for all assets their jurisdiction manage, 19 percent said their goal is to have two or more asset management systems, and 46 percent said they do not use systems.

Ease of using a system and staff skills and capacity to use the system are the top two reasons why particular asset management systems are selected by jurisdictions. Cost of the system was also identified as an important factor. Smaller jurisdictions, in particular, face barriers in having adequate staff capacity and financial resources to obtain and effectively implement asset management systems. The chart on the following page illustrates the importance of various factors jurisdictions consider when deciding which asset management system to use.

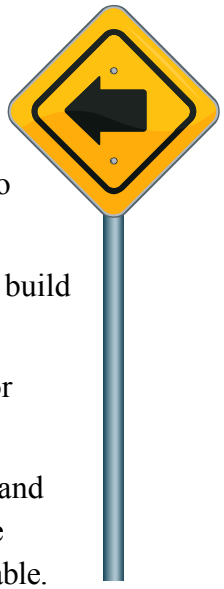
Respondents' ratings of the importance of each of these factors when deciding which asset management system(s) to use*



**A range of 430-438 survey respondents answered these questions.*

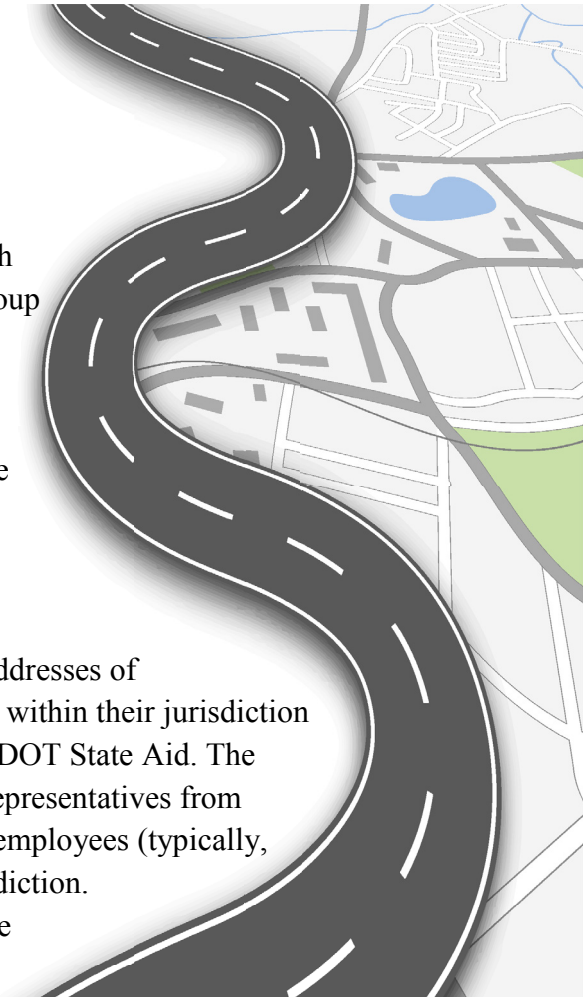
Recommendations

The following recommendations should be considered as possible ways to strengthen asset management practices in Minnesota:



- Make resources available, especially for smaller cities and smaller counties, to implement an asset management system.
- Host conferences, training sessions, webinars, or other forms of education to help those who want to begin or strengthen asset management practices in their jurisdictions.
- Consider advocating for the use of a few select, easy-to-use asset management systems to promote consistency, collaboration, and capacity across jurisdictions.
- Facilitate the building of relationships with neighboring jurisdictions and consortiums to build regional capacity for using asset management practices and systems.
- Explore public policy solutions that could make asset management a standard practice for every jurisdiction.
- More research is needed to understand how to best support Minnesota's cities, counties, and state agencies in their use of asset management practices and systems, and better data are needed to estimate the total value of Minnesota's infrastructure and the gap in funding available.

Study methods and participants



Survey instrument design

The first survey was designed by MN2050 and Wilder Research with input from MnDOT State Aid and the study's advisory group (a group of civil engineering professionals) in 2015. Revisions were made to the survey in 2016 to better address the research questions. The survey included questions about the use of asset management practices; types of infrastructure managed; and the condition, value, and mapping of each type of infrastructure.

Survey respondents

MN2050 and Wilder Research obtained the names and email addresses of representatives from the engineering/public works departments within their jurisdiction for counties and large cities, and state representatives from MnDOT State Aid. The League of Minnesota Cities provided contact information for representatives from small cities. Most often, survey respondents were government employees (typically, engineers) or consultants (engineering firms) hired by the jurisdiction.
Note: Other state agencies that are responsible for managing the state's infrastructure assets were not included in this survey.

Data collection

All sampled jurisdictions were sent an email inviting them to participate in the web survey. In 2016, the survey invitation email was sent on February 17, 2016. The survey officially closed on April 1, 2016, after four reminder emails were sent to respondents to complete the survey. The 2015 survey was administered in June-July 2015 and used a similar sequence of email invitations.

Completed surveys

In 2016, the survey was emailed to representatives from 87 counties, 148 large cities (with populations of 5,000 or more), 710 small cities (with populations of less than 5,000), and two state agencies (MnDOT and Metropolitan Council). In 2015 the survey was sent to the same state agencies, counties, and larger cities, and a more abbreviated list of smaller cities (only those that had a public works contact listed with the League of Minnesota Cities).

The completed surveys for 2015 and 2016 combined include 316 smaller cities (45% of all small cities that were invited to participate), 129 larger cities (87%), 82 counties (94%), and both state agencies for a total of 529 respondents (56% overall response rate). (Responses from 79 jurisdictions from 2015 were included in the 2015/2016 analysis because they did not respond in 2016.) For a more detailed description of the methods used and detailed tables for every question on the survey, please see the 'Data Book'. See the chart below for more information about the sample and response rate.

Survey respondents

	Total number of jurisdictions of this type in MN[3]	Number of jurisdictions					Response rate 2015/2016[5]
		Sampled		Completed			
		2015	2016	2015	2016	2015/2016[4]	
Cities with less than 5,000 residents [1]	2,496	269	710	96	266	316	45%
Cities with 5,000 or more residents [2]	159	148	148	104	109	129	87%
Counties [2]	87	87	87	64	73	82	94%
State agencies	2	2	2	2	2	2	100%
Total	2,744	506	947	266	450	529	56%

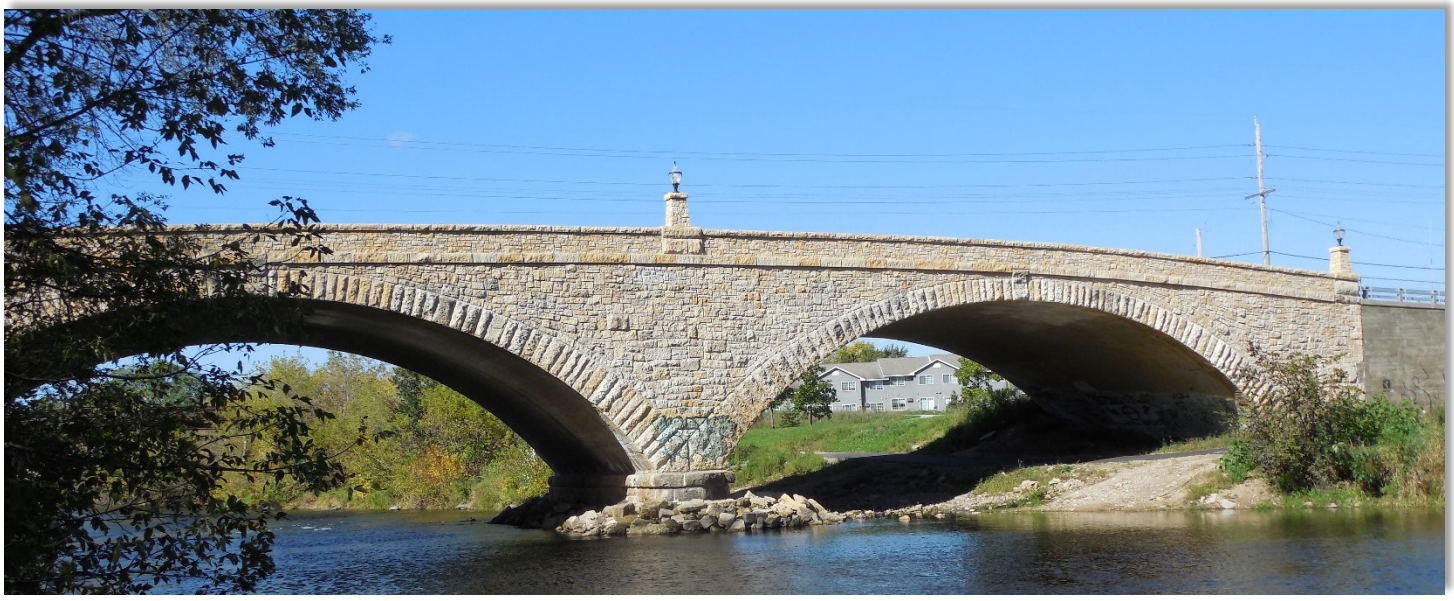
[1] *Sample provided by League of Minnesota Cities*

[2] *Sample provided by MnDOT State Aid*

[3] *Minnesota State Demographic Center and the Metropolitan Council, 2014*

[4] *Total number of jurisdictions that data is reported for; they completed either the 2015 and/or the 2016 surveys*

[5] *Calculated with 2016 sample as the denominator and number of completed responses from 2015 and 2016 combined as the numerator*



Rehabilitated Roosevelt Bridge (1934) in Mower County

Photo courtesy of MnDOT State Aid

MN 2050
Infrastructure planning, long term success

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For more information

This summary presents highlights of the *2015-2016 State of the Infrastructure Survey*. For more information about this report, contact Nicole MartinRogers at Wilder Research, 651-280-2682.

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JUNE 2016