DEPARTMENT OF TRANSPORTATION

2018 Report on the

Corridors of Commerce Program

November 2018

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Legislative Request

This report is issued to comply with Minnesota Statutes 161.088, subdivision 7.

161.088 CORRIDORS OF COMMERCE PROGRAM.

Subd. 7. Legislative report; evaluation.

(a) Annually by November 1, the commissioner must electronically submit a report on the corridors of commerce program to the chairs and ranking minority members of the legislative committees with jurisdiction over transportation policy and finance. At a minimum, the report must include:

(1) a summary of the program, including a review of:

(i) project selection process details that address program design and implementation, decision-making procedures, and eligibility evaluation;

(ii) criteria measurement methodologies and criteria weighting used in project selection; and

(iii) the policy that provides the weight given each criterion;

(2) a summary of program finance, including funds expended in the previous selection cycle, any future operating costs assigned under subdivision 6, and total funds expended since program inception;

(3) a list of projects funded under the program in the previous selection cycle, including:

(i) project classification;

(ii) a breakdown of project costs and funding sources; and

(iii) a brief project description that is comprehensible to a lay audience;

(4) a comprehensive list of evaluated projects and candidate project recommendations as required under subdivision 5, paragraph (b), that identifies for each project: eligibility, classification, evaluation results for each criterion, score, and disposition in the selection process; and

(5) any recommendations for changes to statutory requirements of the program.

(b) In every even-numbered year, the commissioner must incorporate into the report the results of an independent evaluation of impacts and effectiveness of the program. The evaluation must be performed by agency staff or a consultant. The individual or individuals performing the evaluation must have experience in program evaluation, but must not be regularly involved in the program's implementation.

(c) Notwithstanding paragraph (a), a report is not required in a year in which:

(1) no project selection was completed during the preceding 12 months; and

(2) an evaluation under paragraph (b) is not due.

The cost of preparing this report is less than $5,000.

Corridors of Commerce Program - Overview

A healthy transportation network supports a growing economy by facilitating commerce throughout the state. Transportation investments directly and indirectly foster economic growth with construction jobs and a commerce-friendly network of corridors to ship goods and provide mobility to citizens. In 2013, the Minnesota Legislature created the Corridors of Commerce program with the purpose of achieving two major goals:[1]

- Provide additional highway capacity on segments where bottlenecks occur in the system
- Improve and preserve the movement of freight and reduce barriers to commerce

Project Eligibility

The original 2013 law established eligibility requirements for a trunk highway project to be included in the program. During the 2017 Legislative Session, the eligibility requirements were updated and for a project to be eligible for the program it must meet the following new requirements:

1. The project must be classified as a Capacity Improvement Project or a Freight Improvement Project. The qualifying criteria for each classification is as follows:

    a) Capacity Improvement Project

    - The highway is currently not a divided highway and the highway is an expressway or a freeway beyond the project limits.
    - The highway intersects with another highway, but lacks an access between them either at-grade or an interchange. In other words, the junction of two highways contains an endpoint rather than access to the other highway, such as an intersection or interchange.
    - The highway contains a highway terminus that lacks an intersection or interchange with another state highway.
    - The highway has fewer travel lanes in the project area than the number of travel lanes beyond the project limits.
    - Within the proposed project there is a new interchange or an intersection that will be reconstructed from an at-grade intersection to an interchange.

    b) Freight Improvement Project

    - Removes or reduces an existing barrier to commerce.
    - Preserves existing freight movement.
    - Supports an emerging industry
    - Provides connections between the state highway system and other transportation modes for the movement of freight.

1 Created by Laws 2013, Ch. 117, Art. 3, sec. 1, becoming Minn. Stat. 161.088.

2. Projects must be consistent with the statewide multimodal transportation plan.

3. Projects must be on the Interregional Corridor Network of state highways, which includes MnDOT's supplemental freight routes, for Greater Minnesota or on any state highway in the eight-county MnDOT Metropolitan District.

4. Projects must be able to begin construction within four years of award of the funding, but the actual construction start may be delayed beyond four years to avoid significant traveling public impacts from having parallel routes in the same region under construction at the same time.

5. The amount of Corridors of Commerce funding needed to construct the project (including construction cost, right-of-way and engineering) cannot exceed the amount of funding available.

6. The project cannot already be listed in MnDOT's State Transportation Improvement Program.

Project Selection

Project selection for the first three funding rounds (2013, 2014 and 2015) of the Corridors of Commerce program was governed by the seven selection criteria that were in the original 2013 legislation. Those seven criteria were as follows:

- Commerce and economic impacts
- Return on investment
- Efficiency in freight movement
- Traffic safety improvements
- Transportation system connections
- Transportation policy objectives addressed
- Community support

As authorized under the original statute, MnDOT varied its application of some of the selection criteria based on the circumstances surrounding each program year for funding and program development. For example, there were some project selection constraints because trunk highway bonds were used to finance the program in 2013. As another example, a higher emphasis was placed on project readiness in 2013 and 2014.

In 2016, the Office of the Legislative Auditor performed a program evaluation on MnDOT's highway project selection processes[2]. The report recommended some specific improvements to how MnDOT selected projects for the Corridors of Commerce program for the future. Following that report came the passage of 2017 Laws of Minnesota, 1st Special Session, Chapter 3, Article 3, Sections 20-22, This legislation required changes in the process for how MnDOT selects projects for the program. Those required changes included the following:

- MnDOT needed to establish a process to identify, evaluate and select projects under the program.
- The process must use all seven of the original selection criteria in the law, plus an added eighth criteria of "regional balance" and may not include any additional evaluation criteria.
- All projects that meet the eligibility criteria for the program must be scored.

[2] Office of the Legislative Auditor, "MnDOT Highway Project Selection," March 2016.

- The list of projects evaluated must be made public and include the score of each project.

In the summer of 2017, MnDOT began the development of a more formalized project selection process. While developing the scoring process and factors to be used for each criteria, MnDOT conducted two rounds of input meetings across the state seeking input from stakeholders, businesses, corridor coalitions and the public. In addition, MnDOT used these meetings to draw attention to the 2017 changes to the Corridors of Commerce law to promote understanding about the process and criteria. After considerable input, particularly regarding the new "regional balance" criteria, in January 2018, MnDOT adopted its new "Corridors of Commerce Program Guidance & Selection Process." A copy of the new selection process guidance is located in Appendix A of this report.

Public Recommendations

One of the requirements of the Corridors of Commerce program is that MnDOT must accept recommendations on candidate projects from area transportation partnerships and other interested stakeholders. For the 2013 funding, MnDOT developed and selected the list of projects for Corridors of Commerce funding after asking for recommendations from stakeholders, the public and MnDOT's district staff. In light of the 2017 revisions that all eligible recommended projects be evaluated, and because of some of the issues raised in the Office of Legislative Auditor's Report, MnDOT made an agency decision that it would not submit any project recommendations for the 2017 funding and would instead score and select only projects submitted through the public recommendation process.

In January 2018, MnDOT used an on-line project process to receive public project recommendations for the FY 2017 funding. Recommendations were taken from local government representatives, corridor coalition representatives, businesses, and the general public. A list of all the suggestions received for the 2017 funding is available on the Corridors of Commerce website. For the 2018 funding, the legislation required MnDOT to use the projects previously submitted and scored, so no additional public recommendations were taken at that time.

Funding

In 2013, the initial funding for the program was from $300 million in trunk highway bonds, which MnDOT supplemented with funds from other state and federal sources. In the 2014 legislative session, the Legislature provided trunk highway funds totaling $31.5 million for FY 2014 and FY 2015. The program did not receive funding as part of the 2016-2017 transportation budget, so there was not a 2016 solicitation and project selection round.

During the 2017 legislative session, additional funding was provided to the program. A total of $300 million in trunk highway bonds was made available for the program from FY 2018 through FY 2021. In addition, $25 million in cash each year was added for Corridors of Commerce. The cash addition extends to future biennium budgets, so, in total the cash amounts to $100 million. As a result, MnDOT targeted a $400 million level for 2017 funding for project selection ($300 million in bonds and $50 million in trunk highway cash from the 2018-2019 biennium and $50 million in trunk highway cash from the 2020-2021 biennium). When MnDOT completed the project scoring and ranking process on the projects, a natural break in the scoring of the projects occurred at the $417 million level. MnDOT made the decision to program the $417 million worth of projects, essentially committing $25 million from the 2022-2023 biennium as well.

A summary of the Corridors of Commerce Program funding is found in the table below.

Table 1: Corridors of Commerce Funding Overview

Year	Trunk Highway Bonds	Trunk Highway Funds	Total Funding	No. of Projects
2013	$300,000,000		$300,000,000	11
2014		$6,500,000	$6,500,000	4
2015		$25,000,000	$25,000,000	12
2016			$0	0
2017	$300,000,000	$125,000,000	$425,000,000	4
2018	$400,000,000	$25,000,000	$425,000,000	3
Total	$1,000,000,000	$181,500,000	$1,181,500,000	34

Note: amounts exclude project funding from other sources

2013 Corridors of Commerce Summary

MnDOT originally selected ten projects for the $300 million in bonds from the 2013 funding. After the initial selection, two individual TH 14 projects were merged into one project resulting in a total of nine projects. Following the original project selection, MnDOT placed an emphasis on managing the scope and cost of the selected projects to minimize the risk of exceeding the program budget. The efforts resulted in projected total costs coming in substantially below the original estimated amount, allowing MnDOT to capture project savings and delivery efficiencies. As a result, two additional projects were added to the program using 2013 funding. Those projects were a four-lane widening project on Highway 371 from Nisswa to Jenkins in District 3 and the I-35W MnPASS north expansion project in the Twin Cities Metro area. These projects did not rely solely on the Corridors of Commerce funding for construction. A summary listing of all projects that received 2013 funding is listed in Table 2.

Table 2: Revised 2013 Projects Selected

District	Route	Description	Project Category	Status	Project Delivery*	Construction	Total Funding Needed
Original Projects Selected							$300,000,000
1	Hwy 169	Lane expansion in Itasca County	Freight Bottleneck	Construction complete and open to traffic	$1,800,000	$6,100,000	$7,900,000
2	Hwy 2	Passing lanes between Cass Lake and Deer River	Freight Bottleneck	Construction complete and open to traffic	$110,000	$13,800,000	$13,910,000
3	I-94	Auxiliary lanes from Rogers to St. Michael	IRC Capacity Improvement	Construction complete and open to traffic	$2,900,000	$28,400,000	$31,300,000
4	Hwy 34	Passing lanes between Detroit Lakes and Nevis	Freight Bottleneck	Construction complete and open to traffic	$46,000	$8,566,000	$8,612,000
M	Hwy 610	Freeway completion to I-94	Metro Capacity Improvement	Construction complete and open to traffic	$4,643,000	$75,657,000	$80,300,000
M	I-694	Reconstruction and lane expansion in Arden Hills and Little Canada	Metro Capacity Improvement	Construction complete and open to traffic	$2,800,000	$36,000,000	$38,800,000
6	Hwy 14	Lane expansion near Owatonna	IRC Capacity Improvement	Construction complete and open to traffic	$46,000	$12,054,000	$12,100,000
7	Hwy 14	Lane expansion from Nicollet to North Mankato; Nicollet bypass	IRC Capacity Improvement	Construction complete and open to traffic	$2,200,000	$32,500,000	$34,700,000
8	Hwy 23	Passing lanes between Willmar and I-90	Freight Bottleneck	Construction complete and open to traffic	$286,000	$8,400,000	$8,686,000
Original Projects Total				*All Complete*	$14,831,000	$221,477,000	$236,308,000
Additional Projects Selected							
3	Hwy 371**	Lane expansion from Nisswa to Jenkins	IRC Capacity Improvement	Construction complete and open to traffic	$3,500,000	$41,900,000	$45,400,000
M	I-35W**	I-35W North MnPASS expansion	Metro Capacity Improvement	On-schedule for Fall 2018 letting and 2019 construction start.	$3,000,000	$15,300,000	$18,292,000
Additional Projects Total				*1 of 2 Complete*			$63,692,000
Remaining Balance							$0

*Professional/Technical Only

Note: Table excludes project funding from other sources.

2014 Corridors of Commerce Summary

As part of a supplemental budget, the 2014 Legislature provided $31.5 million in trunk highway funding for Corridors of Commerce. The law required that $6.5 million was available in FY 2014 for projects only in Greater Minnesota and $25 million was available in FY 2015 for projects statewide. The legislation allowed the funding to be used to prepare potential projects for future construction. Preparations could include right of way purchases, environmental work and design engineering. These activities were not been allowed with the 2013 funding, and so this helped MnDOT advance more complex projects towards the shovel ready status for construction.

There was then an immediate need to identify FY 2014 projects so, MnDOT used the projects previously suggested by the MnDOT districts, stakeholders and the public. Since the focus of the 2014 program was to prepare projects for future construction, MnDOT adjusted its project consideration criteria to include the following:

- Advancement of the readiness of a future project
- Preservation of efficient freight movement
- Return on investment
- Local support

Four projects were selected for this round of funding (see Table 3). Two of the projects, Highway 14 and Highway 23, involved preparing major corridors for future expansion should additional funding become available. The Highway 34 project was for construction to complete a gap on the corridor that was not covered with the project funded in 2013 Corridors of Commerce program. The final project selected, Highway 2 in Deer River, was a reconstruction along the main corridor through town. This "Main Street" rebuilding project is an example of how the Corridors of Commerce program is able to provide statewide transportation benefits (through the improved condition and operation of Highway 2) and local economic benefits. In this instance, the community was able to access and improve their underground utilities.

Table 3: Projects Selected with FY 2014 Funding

District	Route	Description	Project Category	Cost Estimate	Current Status
6	Hwy 14	Purchase right of way for expansion between Dodge Center and Owatonna	IRC Capacity Development	$1,500,000	Combined with Hwy 14 project in 2015 funding. 18 of 20 offers have been made, with 4 offers accepted.
8, 3	Hwy 23	Environmental work for expansion on two segments, from New London to Paynesville and from Paynesville to Richmond	IRC Capacity Development	$1,500,000	Southern segment: environmental work complete, and the layout is under review. Northern segment: environmental work and layout are under development.
4	Hwy 34	Center left turn lane in Detroit Lakes from Highway 59 to County Road 141	Freight Improvement	N/A	Combined with TH 34 project in 2015 funding for construction efficiency
1	Hwy 2	Reconstruct segment of roadway in Deer River	Freight Improvement	$2,300,000	Scheduled for summer 2017 construction

2015 Corridors of Commerce Summary

For the $25 million allotted in fiscal year 2015, MnDOT used the same process it used on the 2013 projects, with the addition of the following:

- Approximately 50 percent of the funding to went to the Twin Cities metro area and 50 percent of the funding went to Greater Minnesota

Unlike the FY 2014 funding round, there was sufficient time to go through the same type of project solicitation and selection process that was done in 2013. MnDOT again used the Corridors of Commerce website to allow stakeholders, businesses and the public to submit potential projects for consideration. MnDOT used the projects submitted during the 2013 project identification process as a starting point for the 2015 list. This meant that all the projects suggested from the 2013 process were automatically included on the 2015 list, unless the project was constructed. New suggestions were then added, including any new ones received from the public solicitation or from internal district submissions.

The focus of the 2014 legislation was on getting projects ready for construction if new funding became available. MnDOT's selected projects for funding that met the following goals:

- Met the goals and were eligible for the program
- Were a high priority from the district perspective
- Would substantially accelerate the project's readiness
- Had local support

Twelve projects were selected for funding—six in Greater Minnesota and six in the Twin Cities metro area.

In Greater Minnesota, five of the projects specifically accelerated major improvements along several key corridors. From preliminary design to right of way acquisition, these five projects enhance MnDOT's ability to deliver major corridor investments, if funding became available. The sixth Greater Minnesota project involved performing some greatly needed resurfacing work on Highway 34 to help maintain reliable east-west freight movements in northern Minnesota.

In the Twin Cities metro area, three of the six projects selected involved developing the designs for major bridge and roadway replacements to improve freight movement. Two other projects involved design work for major capacity improvements on I-35W and I-94. One project was for actual construction work along Snelling Avenue in St. Paul for freight improvements, which was part of a larger project on Snelling.

Table 4: Projects Selected with FY 2015 Funding

District	Route	Location	Description	Project Category	Total Funding	Current Status
7	Hwy 14 and Hwy 15	New Ulm	Preliminary design work	Freight Improvement	$700,000 (actual cost about $1,000,000)	In detail design with construction starting Summer of 2019
M, 3	I-94	St. Michael to Albertville	Design options for lane addition	IRC Capacity Development	$1,400,000	Design options complete. Project funded with 2017 funding
2	Hwy 11	Greenbush to Warroad	Design passing lanes	Freight Improvement	$500,000	Preliminary design complete.
6	Hwy 14	Owatonna to Dodge Center	Purchase right of way for expansion	IRC Capacity Development	$7,300,000	In process, project funded with 2018 funding
8, 3	Hwy 23	New London to Paynesville	Purchase right of way for expansion	IRC Capacity Development	$800,000	Starting process, project funded With 2018 funding
4, 3	Hwy 34	Detroit Lakes to Becker	Mill and overlay	Freight Movement Preservation	$3,000,000	Project Complete
M	Hwy 169	Nine Mile Creek	Design work for bridge replacement	Freight Movement Preservation	$1,500,000	Under construction
M	I-35W	Minnesota River crossing	Design work	Freight Movement Preservation	$5,500,000	Design work complete and project is under construction.
M	I-35W	Northern suburbs	Design work for MnPASS system	Metro Capacity Development	$1,100,000	Design work complete with project on schedule for Fall 2018 letting and 2019 construction start
M	Hwy 65	3rd Avenue Bridge over Mississippi	Design work for bridge deck replacement	Freight Movement Preservation	$1,000,000	Design work still in-process
M	I-94	Between Minneapolis and St. Paul	Design work for new pavement, bridges and managed lanes	Metro Capacity Development	$2,000,000	Working on scoping study prior to start of design work
M	Hwy 51 Snelling Ave	Selby Ave. to Pierce Butler in St. Paul	Added funding for reconstruction	Freight Improvement	$1,400,000[1]	Construction complete

[1] Amount is only the portion provided from Corridors of Commerce program

2017 Corridors of Commerce Summary

During the 2017 legislative session, $300 million in funding from trunk highway bonding was provided to the Corridors of Commerce program. In addition, $50 million in trunk highway cash was appropriated to the Corridors of Commerce program, $25 million each fiscal year. The trunk highway cash piece of the legislation was a change to MnDOT's base budget and will carry on in future years, unless the legislature specifically changes the law. MnDOT decided to target a $400 million Corridors of Commerce funding level in 2017 because the trunk highway cash transfer language increase the base budget and because it takes a few years to deliver the bigger capacity projects the program targets.

The 2017 funding was subject to the changes of the 2017 legislation surrounding project eligibility and project scoring. MnDOT developed its "Corridors of Commerce Program Guidance & Selection Process" to address the concerns raised in the Office of Legislative Auditors report and to be compliant with the new 2017 legislation changes.

In January 2018, the project recommendation period was opened up for project proposals and it was the first time the new selection process was used. Since this was a new process, MnDOT was not sure what the final project scoring and selection results would be or how much the selected projects would cost. A total of 172 unique project submissions for a total cost of just over $8.1 billion were received. When the final project scoring list was completed, MnDOT decided to program $417 million because it allowed for a more natural break in the project selection. The additional $17 million will be covered by part of the future FY 2022-2023 trunk highway cash transfer.

Listed in Appendix C is the final project scoring for all the eligible project recommendations received for the FY 2017 funding.

Based upon the scoring outcome, Table 5 represents those projects were selected for the 2017 funding. It should be noted that project budget programmed for each selected project represents a 10 percent reduction in the cost estimate to encourage and re-incorporate savings efficiencies within the program. A total of $213 million of the 2017 funding was selected for Greater Minnesota projects and $204 million was selected for Metro District projects. That split of funding is within MnDOT's stated "Regional Balance Criteria" of a soft 50-50 split of the funding between the two regions.

The I-94 project selected was the lowest priced alternative submitted for scoring and did not include the rebuilding of the County Road 37 interchange or the construction of the Commercial Development road. Since the selection of the 2017 projects, MnDOT determined that the I-94 bridges over County Road 37 will need to be replaced in the future. There are some substantial efficiencies in both cost and construction traffic mitigation to be gained from including the rebuilding of the interchange and construction of the Commercial Development road at the same time as I-94 Corridors of Commerce project. MnDOT is working with local officials to find additional funding beyond the Corridors of Commerce program to cover those costs.

Table 5: Projects Selected with 2017 Funding

Geographic Region	Trunk Highway	Project Description	Project Budget	Earliest Contract Year	Current Status
Greater Minnesota	I-94*	Add an auxiliary lane from St. Michael (Trunk Highway 241) to Albertville (Country Road 37).	$56,000,000	2019	In detail design and on schedule for spring letting.
Metro District	I-494	From France Avenue to Trunk Highway 77 eastbound and from Trunk Highway 77 to I-35W westbound, add MnPASS lanes in both directions.	$134,000,000	2021	In preliminary design and on schedule
Metro District	I-494 & I-35W	Complete Phase 1 of the I-494/I-35W turbine interchange, northbound to westbound directional ramp.	$70,000,000	2021	Preliminary design
Greater Minnesota	TH-169	In Elk River, from TH 101 to 197th Avenue, convert to a freeway.	$157,000,000	2023	Starting environmental process

* This project was the lowest priced alternative submitted and did not include interchange improvement at Country Road 37 or construction of the commercial development road.

2018 Corridors of Commerce Summary

During the 2018 legislative session, an additional $400 million in trunk highway bonding was approved for the Corridors of Commerce program. The bond funding came with some special provisions that impacted which projects were eligible for the funding. Those special provisions were as follows:

- MnDOT must select projects solely using the scoring results from the 2017 funding program
- Projects will be selected based up the projects scored order or rank
- At least two projects from outside of MnDOT's Metro District must be selected
- For projects outside of MnDOT's Metro District, MnDOT must select projects in counties that did not receive project funding from the 2017 funding program.

After applying the special provisions, MnDOT selected the next three projects for the 2018 funding. Table 6 below provides information regarding the three selected projects. Like Table 5, the project budget amount programmed for each selected project represents a 10 percent reduction in the cost estimate to encourage and re-incorporate savings efficiencies within the program.

Table 6: Projects Selected with 2018 Funding

Geographic Region	Trunk Highway	Project Description	Project Budget*	Earliest Contract Year*	Current Status
Greater Minnesota	TH 14	Expand Highway 14 from two lanes to four lanes between Owatonna and Dodge Center, completing a continuous four-lane roadway between I-35 and Rochester.	$144,000,000	2022	Detail design and right-of-way acquisition.
Greater Minnesota	TH 23	Complete two gaps (New London to Paynesville and Paynesville to Richmond) to create a continuous four-lane roadway from Willmar to St. Cloud.	$95,000,000	2022 & 2024**	Preliminary design and initial right-of-way acquisition.
Metro District	TH 252 / I-94	Convert to a freeway and add MnPASS lanes from Dowling to TH 610.	$150,000,000***	2023	Preliminary design

*The 2018 bonds are not available until FY 2022 at the earliest, even though the 2018 projects could be delivered earlier than that.
**Although selected as one project for funding, for efficiency and traffic mitigation, construction will be as two separate projects.
***This amount includes $31 million in local funding contributions towards the project.

From Table 6, a total of $358 million was programmed for the three project budgets. The remaining $42 million in bonds from 2018 funding will be used as a contingency to cover potential inflation on the projects. This is necessary because the three projects selected for 2018 funding were chosen based off the scoring for the 2017 funding. For the 2017 scores, the cost estimates for the projects were based upon the 2017 funding availability for inflation and did not carry inflation out as far as needed for the 2018 funding availability. MnDOT is striving to deliver the 2018 projects within their project budget levels through efficiencies and alternative delivery options. Any contingency not used by these projects will be combined with any future available cash transfers for an additional smaller project selection round.

Program Effectiveness Evaluation Summary

A feature of the Corridors of Commerce program is legislative direction to incorporate into the legislative report the "results of an independent evaluation of impacts and effectiveness of the program," which is to be provided biennially starting in 2016.[3] MnDOT staff not involved with regular Corridors of Commerce program implementation performed the analysis. Findings are summarized below and the full evaluation is provided in Appendix B.

The program effectiveness evaluation reviewed Corridors of Commerce projects that are now complete and funded from the initial implementation in 2013, projects from the 2014 selection round and projects from the 2015 project selection round. A highway project is typically a multiyear endeavor and proceeds through project development (such as design, engineering and environmental analysis) and construction steps. As a result, for this evaluation there are 13completed projects ready for review. The projects are listed in Table 7.

Table 7: Completed 2013-2015 Projects

District	Route	Construction End Month
2	Hwy 2 (Passing lanes from Cass Lake to Deer River)	Oct. 2015
3	I-94	Oct. 2015
4	Hwy 34 (Passing lanes from Detroit Lakes to Nevis)	Nov. 2015
6	Hwy 14 ("Segment 1" of Owatonna to Dodge Center)	Oct. 2015
Metro	Hwy 610	Oct. 2016
8	Hwy 23 (Passing lanes -- South)	Aug. 2016
8	Hwy 23 (Passing lanes – North)	Oct. 2016
7	Hwy 14 (North Mankato to Nicollet)	Nov. 2016
4	Hwy 34 (Center left turn lane in Detroit Lakes / Mill and overlay)	Aug. 2017
2	Hwy 2 (Reconstruct in Deer River)	Aug. 2017
Metro	I-694	Sept. 2017
3	Hwy 371	Oct. 2017
1	Hwy 169	June 2018

The evaluation focuses on the quantifiable criteria used in selecting projects, outlined below.

- **Construction timing and duration**. Project delivery effectiveness was gauged by comparing the original estimates of construction start date (made when projects were selected into the program) to actual commencement and completion of construction work.
- **Construction cost**. Cost management and oversight was reviewed by comparing construction cost estimates made at different points in the project development process and final cost amounts.
- **Vehicle speeds**. Traffic speed can be used to measure roadway capacity and efficient movement. Speed for both passenger automobiles and trucks were examined, comparing speed averages prior to construction against both predicted and observed speeds following project completion.

[3] Minn. Stat. 161.088, subd. 7 (b).

- **Traffic safety – crash incidence and severity**. Crash data provides an important way to help identify changes in traffic safety at each of the project locations. However, it is too soon following construction to be able to obtain information on crashes that occurred in the areas of the Corridors of Commerce projects. The evaluation established an analytical approach that can be used—once sufficient post-construction data is available—to identify any likely change in crashes. This approach is based on comparing crash incidents before and after a given Corridors of Commerce project.
- **Freight movement – commercial vehicle traffic growth**. To track developments in freight movement, a trend analysis evaluation technique was created that reviews truck traffic changes in each of the Corridors of Commerce project corridors. This technique is designed to isolate traffic impacts that are more likely to come from the Corridors of Commerce project itself. It reviews heavy commercial vehicle growth over a period of years prior to each project, while adjusting for general statewide growth in truck traffic. As with the analysis of crashes, there is too little post-construction traffic data to observe whether there is commercial vehicle growth (beyond a general statewide "baseline") that is attributable to the Corridors of Commerce project.

Summarizing the findings, the set of completed Corridors of Commerce projects uniformly score well on the dimension of construction scheduling, namely timing and duration. In all projects, construction started before or in the originally estimated year. The majority of projects also demonstrate effective cost management throughout their development cycle with respect to initial construction cost estimates, shown by final construction costs coming in below the initial estimates. All but one of the corridors (U.S. Highway 2 between Cass Lake and Deer River) evaluated in this study now support measurably higher vehicle speeds than the pre-expansion baseline levels, although the magnitude of the speed improvement is generally below planning expectations.

The remaining two criteria of traffic safety based on crashes and freight movement growth cannot yet be fully assessed because there is insufficient performance data published to date reflecting actual conditions following the Corridors of Commerce work. Official crash rate data is not available for a long enough post-construction period to permit a reliable analysis of safety conditions, while heavy commercial vehicle data allows for only a single year of observed traffic growth rates following completion of construction and opening to traffic. For the time being, the descriptions for these measures include historical trend data, analysis examples with hypothetical data and expected crash rate reductions in the case of traffic safety to guide upcoming before/after comparisons once a more complete data series extending beyond the end of construction can be compiled.

Appendix A: Corridors of Commerce Program Guidance and Selection Process

Corridors of Commerce Program Guidance & Selection Process

I. Overview

A healthy transportation network supports a growing economy by helping facilitate commerce throughout the state. Transportation investments directly and indirectly foster economic growth through the provision of construction jobs and a commerce-friendly network of corridors to ship goods and provide mobility to citizens. In 2013, the Minnesota Legislature created the Corridors of Commerce Program with the purpose of achieving two major goals:

- Provide additional highway capacity on segments where there is currently bottlenecks in the system;
- Improve the movement of freight and reduce barriers to commerce

The Corridors of Commerce program is not intended to serve as an alternative funding mechanism for MnDOT's regular preservation and expansion program. The Minnesota Legislature set up this program to be separate from MnDOT's regular program and even established separate eligibility and scoring criteria for the program that are different than MnDOT's regular program priorities.

II. Project Eligibility

The Corridors of Commerce law specifically laid out program eligibility guidelines. For a project to be eligible, it must meet the following eligibility requirements:

1. Projects must either be classified as a Capacity Improvement Projects or Freight Improvement Projects. The requirements for each of those classifications are as follows;
    - Capacity improvement projects must meet one of the following:
        - Currently is not a divided highway and that highway is an expressway or freeway beyond the project limits
        - Contains a highway terminus that lacks an intersection or interchange with another trunk highway
        - Contains fewer lanes of travel compared to that highway beyond the project limits
        - Contains a location that is proposed as a new interchange or to be reconstructed from an intersection to an interchange
    - Freight improvement projects must meet one of the following:
        - Remove or reduce an existing barrier to commerce
        - Preserve existing freight movement
        - Support an emerging industry
        - Provide connections between the trunk highway system and other transportation modes for the movement of freight
2. Projects must be consistent with the statewide multimodal transportation plan.
3. Projects must be able to begin construction within four years of award of the funding, but the actual construction start may be delayed beyond four years to avoid significant traveling public impacts from having parallel routes in the same region under construction at the same time.

4. Projects must be on the Interregional Corridor Network of state highways, including the supplemental freight routes, in Greater Minnesota or any state highway in the eight-county MnDOT Metropolitan District.

5. The amount of corridors of commerce funding needed to construct the project (including construction cost, right-of-way and engineering) cannot exceed the amount of funding available.

6. An identical project cannot already be listed in MnDOT's State Transportation Improvement Program, but it may be listed in the last six years of the 10-year Capital Highway Investment Plan.

III. Project Recommendations

The Process

MnDOT will use an online recommendation process to receive potential projects for funding from the Corridors of Commerce program. The online recommendation process will be open to anyone wanting to submit a potential project for consideration. The online submission form will require only a limited amount of information, helping to ensure the process is as open as possible.

Individuals wishing to recommend a project for consideration for the program will need to provide the following information in the online form:

- Name and contact phone number (to clarify any questions about the recommended project)
- Name and number of a technical issues contact, such as a county engineer (If the submitter can identify one)
- Highway number where the project is located
- A beginning and ending location description of the project
- Selection of one of the project descriptions provided or writing one of their own under "other"
- The dollar amount and source of other funding that is already committed and guaranteed to the project if it is selected

MnDOT Recommendations

MnDOT will not make any agency project recommendations as a part of this process. Instead, MnDOT will rely solely upon the online recommendation process to provide the list of projects to be considered for the program.

IV. Scoring and Ranking

Legislative Criteria

The Corridors of Commerce law includes eight criteria that MnDOT must use to score and rank projects for the program. The law requires that all eight criteria must be used and that MnDOT cannot add any additional criteria. The eight criteria in the law are as follows:

- Return on Investment
- Economic Competitiveness
- Freight Efficiency
- Safety
- Regional Connections
- Policy Objectives
- Community Consensus
- Regional Balance

Scoring Overview

All projects that have been determined to be eligible for the program will be scored. Up to a 100 points each will be awarded to projects in seven of the eight criteria. Therefore, the top point score for a project would be 700 points. The eighth criteria, regional balance, was set-up as a funding division criterion to be applied after the projects were scored and ranked using the other seven criteria.

For the return on investment, economic competitiveness, freight efficiency and safety criteria, MnDOT will score using a decile system approach. Under this approach, project outputs that relate to each of the criteria will be compared against each by sorting them from the best output down to the lowest output. The project outputs will then be divided into 10 equal groups or deciles based upon where they compare to all the other projects. Those projects with an output in the top decile (the top 10 percent) will receive the maximum number of points for that output. Those projects with an output in the bottom decile (bottom 10 percent) will receive the lowest number of points for that output. Table 8 below is an example of how the decile scoring system works.

Table 8: Decile Scoring System Example

DECILE		POINTS
Top Decile	=	50 points
2nd Decile	=	45 points
3rd Decile	=	40 points
4th Decile	=	35 points
5th Decile	=	30 points
6th Decile	=	25 points
7th Decile	=	20 points
8th Decile	=	15 points
9th Decile	=	10 points
Bottom Decile	=	5 points

There are two project outputs for each criteria, except economic competitiveness, which has just one. Therefore, a project may score 50 points in one output and only 30 points in the other output to get a combined 80 points for that criteria.

The remaining three scored criteria of regional connections, policy objectives and community consensus have specific scoring matrixes developed for them. Each of those matrixes will determine the amount of points a project receives from that criteria. Each of the scoring criteria and the methodology being incorporated with them is discussed briefly in the next section.

Individual Criteria Scoring Methodology

Return on Investment

The laws states the first criteria is a return on investment measure that provides for comparison across eligible projects. MnDOT will incorporate the project effectiveness analysis from the FHWA Highway Capacity manual as the basis for determining ROI outputs. There are essentially two outputs as a part of this analysis-travel time savings and five-year crash reduction savings.

Travel time savings are calculated by first determining what the current travel times are along the roadway (MnDOT will be using one of two available travel time data sets which incorporates cell phone and GPS data). Next, future travel times are calculated based upon the recommended project being constructed. There are two factors that can impact future travel times on the corridor: increases in the capacity of the roadway and increases in the posted speed limit resulting from the improvement. Combined together, these savings represent the total travel time savings. The total savings is then divided by the cost of the project to the Corridors of Commerce Program to determine a return on investment output for travel time.

Please note the cost used to determine the ROI is the cost to the Corridors of Commerce program and not the total cost of the project. As an example, if a project's total cost was $100 million but the submitter was only asking for $50 million from the program because the other $50 million is covered from other sources, the travel time savings would be divided by $50 million and not $100 million. This is also true for the five-year Crash Reduction Savings below.

Five-Year Crash Reduction Savings are calculated by first determining the type and severity of crashes at the proposed project locations for the last five years using MnDOT's crash data. Using FHWA's Crash Modification Factors, it is possible to project the amount of reduction in crashes a particular type of improvement can be expected to generate. For example, if there are 100 specific type of crashes in the project area and the modification factor projects the project will result in a 50 percent savings in those crashes, the project will result in savings of 50 of those particular crashes. The number of crash savings by each type is then multiplied by the individual crash cost to produce a total crash savings from the improvement. The total savings is then divided by the cost of the project to the Corridors of Commerce program to determine a return on investment output for Five-Year Crash Savings.

Economic Competitiveness

The law reads that the project must produce a measurable impact on commerce and economic competitiveness. MnDOT purchased the Regional Input-Output Modeling System, also known as RIMS-II, data set for each MnDOT district. That data set summarizes a multiplier of the number of jobs per million dollars of investment factor for each of the eight MnDOT districts. To determine the output for the criteria, the total cost of the project (not the cost to the Corridors of Commerce program) is multiplied by the respective multiplier factor in Table 9.

Table 9: District Multiplier Table

District	Multiplier
District 1 – Northeast Minnesota	9.9502
District 2 - North Central Minnesota	8.6916
District 3 – Central Minnesota	10.2447
District 4 – Northwest Minnesota	8.4549
District 6 – Southeast Minnesota	9.6264
District 7 – Southern Minnesota	9.6277
District 8 – Southwest Minnesota	9.5527
Metro	11.4459

RIMS-II estimates the total amount of direct and indirect economic benefit from the total investment. It does not estimate increased economic development potential. MnDOT plans to conduct additional research into better methods for calculating the economic competitiveness benefits of a project for future Corridors of Commerce program selections.

Freight Efficiency

For this criteria in the law it states, "…measures of annual average daily traffic and commercial vehicle miles traveled, which may include data near the project location on the trunk highway or on connecting trunk or local highways; and measures of congestion or travel time reliability, which may be within or near the projects limits, or both." To cover this criteria effectively, two project outputs will be used to calculate points - travel reliability and heavy commercial average annual daily traffic.

Travel reliability will be calculated using the same travel time data from the return on investment travel time savings output, however the data will be looked at differently. Instead of calculating the travel time savings, the reliability of the roadway's travel time will be evaluated. Both the percentage and degree of travel time unreliability will be used to develop an index that can be compared to all the other projects. For more specific information about the travel reliability calculation, please consult the technical scoring system document also located on the Corridors of Commerce website.

Heavy commercial average annual daily traffic will be taken from MnDOT's traffic count volumes maps and used directly as this output. MnDOT will determine the closest HCAADT to the project or use a weighted HCAADT figure if more than one volume is available along the project area.

Safety

This criteria in law is a measure in traffic safety improvement. Safety is one of the few areas that can impact multiple scoring criteria. As noted in the return of investment criteria, five-year crash savings from safety improvement from the project has already been given points. For the safety criteria, MnDOT did not want to use the exact same data from the ROI criteria. As a result, MnDOT decided to use two different outputs from its 5-year crash statistics for this criteria that measure the existing crash conditions of the project roadway in comparison to the other project roadways being scored. The two outputs being used are;

- Five-Year Average Number of Fatal and Type A Injury Crashes
- Five-Year Average Number of All Crashes

A decile output score for the fatal/type A injury crashes and all crashes will be calculated for all the projects.

Regional Connections

The law defines this criteria as "connections to regional trade centers, local highway systems, and other transportation modes." To score points for this criteria, MnDOT developed the following point matrix (Table 10) for scoring projects according to this criteria. As a point of clarification, if a recommended project has more than one applicable project type, MnDOT will apply the highest scoring project type from the table to calculate the points.

Table 10: Project Type Point Matrix

Project Type	Greater Minnesota			Metro District	
	Interstate System/Connection to Level 1 Trade Center	IRC System	Supplemental IRC System	Principal Arterials	All Other THs
Closing a gap in a larger corridor (e.g. lane gaps)	100	90	50	100	50
Add lanes to existing facility (expands capacity); does not include filling a gap	90	80	50	90	50
Eliminate existing isolated intersection with an interchange or grade separation; reconstruct intersection/interchange with more capacity	80	70	20	80	20
Completing a corridor conversion (multiple interchanges and access patterns)	N/A	N/A	N/A	70	20
Creating/improving connections to a multimodal facility	60	50	30	60	30
Add passing lanes to a facility	N/A	40	10	10	10
Missing interchange ramps/movements	20	10	10	20	10
Project minimally impacts connectivity between trade centers for users	0	0	0	0	0

Policy Objectives

The Corridors of Commerce law defines this criteria as "the extent to which the project addresses multiple transportation system policy objectives and principles." MnDOT chose to use its Statewide Multimodal Policy Plan as the basis for developing a point matrix for this criteria, see Table 11. Unlike the Corridor Connections matrix, the policy objectives matrix has two separate scoring areas.

The first is the open decision making section. Projects that have had a corridor study, safety plan, safety audit or environmental document that covers the proposed project area will receive 50 points. If the project does not have any of those things, it will receive no points from this section. For a corridor or safety plan to receive points, it must have been completed within the last 10 years for the eight-county metro area or within the last 20 years for the rest of the counties in Minnesota. Although MnDOT does not need to have contributed financially to the study for it to count, MnDOT needs to have been involved and concur with the findings of the study, otherwise it will not receive any points.

The second section on policy objectives matrix covers system stewardship and healthy communities policy areas from MnDOT's policy plan. For each of the bullets a project meets, it receives 10 points for up to a maximum of 50 points

for this section. The bullets have been developed based upon stated goals and priorities from MnDOT's SMPP. Combing section one and two then represent a project's score for the policy objectives criteria.

Table 11: Policy Objectives Matrix

Policy Area	Criteria	Scoring
Open Decision Making	There has been a corridor study, safety plan, safety audit, or environmental document that covers the proposed project.	50 Points
System Stewardship & Healthy Communities	• Pavement and/or bridges within the project area are due for a major rehabilitation or replacement within the next eight years. • Project incorporates ITS technology or a traveler information system component. • The project addresses a significant flooding risk, snow trap/drifting issue or other environmental impact to the reliability of the trunk highway. • Project reduces VMT or hours of congestion. • Project removes an at-grade rail crossing. • Project includes improvements for pedestrians and/or bicyclists. • Project replaces existing overhead lighting with new L.E.D. lighting. • Adds or supports transit service (like park and ride facilities, transit-only shoulders and park and pool locations). • Project will improve access to health care of recreational areas of the State.	10 Points for Each Maximum of 50
TOTAL POINTS AVAILABLE		100

Community Consensus

The Corridors of Commerce definition for this criteria is support and consensus for the project among members of the surrounding community. To best achieve that, MnDOT developed a matrix that asks for resolutions and letters support from three different groups. Looking at Table 12, notice that the first area requires a resolution of support for the project from each of the municipalities and counties impacted by the proposed project. To help ensure that projects meet the spirit of this criteria, MnDOT has made this section an all or nothing points area. To receive the 45 points, all the municipalities and counties impacted by the project need to provide a resolution of support for the project; otherwise the project does not receive any of the 45 points.

The next section of the matrix covers support from the local planning agency for the area. For this section, only letters of support are needed not resolutions. The letters can be from either the chair of the planning agency or its lead staff member. However if a project impacts more than just one regional planning agency, it will need a letter from all covered planning agency to get the points. Otherwise it will not receive any points.

The last section of the community consensus matrix requests a single letter of support from any chamber of commerce. This section was added to help reflect the economic impact nature of the Corridors of Commerce program. There is no requirement that the chamber of commerce letter should come from a chamber in the project's geography, just that a single letter of support be received for the project.

The resolutions and letters of support are not needed for the projects until 60 days after the closing of the online recommendation process. MnDOT will contact all the municipalities and counties impacted by a recommended project by letter to request they consider providing a resolution of support for the project. Within that letter, MnDOT will note that if the local government does not provide a support resolution it will impact the projects scoring within the Corridors of Commerce program. MnDOT will likewise notify the regional planning agencies of projects that will need letters of support from them. The project submitter is responsible for contacting a local chamber of

commerce and have them send a letter of support. All resolutions and letters should be sent by mail or electronically to Patrick Weidemann at MnDOT (See Section VI for contact information).

Table 12: Community Consensus Matrix

Type of Support	What is Needed	Points
Resolutions of Support from Impacted Jurisdictions	Resolutions supporting the project from each municipality and county that is touched by the project limits.	45 – points (If all jurisdictions provide a resolution, otherwise no points.)
Letter of Support	A letter of support for the project from the metropolitan planning organization, regional development commission, or regional planning agency	45 – points (If more than one planning agency touched by the project, must have all provide letters of support or no points awarded)
Letter of Support	A single letter of support for the project from any chamber of commerce	10 - points

Regional Balance

The regional balance criteria does not have any accompanying language with it in the law. MnDOT has decided to apply this criteria as a divisional split of the funding, after all the projects have been scored and ranked based upon the other seven criteria. For the 2013 and 2015 Corridors of Commerce funding programs, MnDOT used a soft 50/50 split of the funding between the Twin Cities Metro and Greater Minnesota. A soft split means the funding was targeted at approximately 50 percent for each region; however the actual dollar split for the two regions was not exactly 50 percent for each, but rather was governed by logical break points in the funded projects.

Project Selection Process

All recommended projects that meet the eligibility requirements of the program will be scored. MnDOT will develop project descriptions and cost estimates for the projects to a sufficient enough level, so that they can be scored in each of the seven point scoring criteria. The projects will then be scored and ranked together on a single list from the highest scoring project to the lowest.

MnDOT will award funding to the projects starting with the top scoring project and continuing down the list until one of the two regional balance Criteria regions (Twin Cities Metro or Greater Minnesota) reaches its approximately 50 percent soft target funding. Once a region reaches its soft target level, no additional projects from that region will be selected even if that region's projects rank higher on the list than the next available other region's projects. Only projects from the region that is not at its soft target level will be selected from that point on, until all of the funding as awarded.

If there are two or more projects tied in the same region and breaking the tie is necessary to determine which of the projects gets funding and which does not, MnDOT will use a tie breaker process. In the tie breaker process, the projects in the Twin Cities Metro area and Greater Minnesota are re-scored in separate pools that will impact how

the projects score in all four of the deciles scoring brackets. From this re-scoring, hopefully most of the ties in a region will be broken. However in the event they are not, MnDOT will use some other method to break the remaining ties.

If there isn't enough of a region's target funding available to fully fund the next project on a list, the project will initially receive what funding is left available and the project submitter will be notified that the project has been "partially funded." The submitter will have 30 calendar days from when they are notified the project is partially funded to try to find other non-MnDOT funding sources to fill-in the funding gap created by the partial funding. If the submitter is unsuccessful, the partial funding on the project will be removed. MnDOT will then proceed down the list of projects to the next available project from that region and will put the funding on that project. If the next project would also be partially funded, the submitter of that project will be also be given 30-days to secure funding for the gap or MnDOT will continue down the list. This process will be repeated until all the funding is awarded.

V. Additional Program Guidance

The following is some additional program guidance and clarifications:

1. MnDOT's cost participation policy applies to all the selected corridors of commerce projects. For purposes of that policy, all projects selected for award in the program will be treated as "MnDOT Initiated" projects.

2. MnDOT will not award funding to a project that does not meet all the applicable state and federal laws, even if it scores the highest in the program.

3. Use of FHWA federal funding on a Corridors of Commerce project is limited to only those projects that were previously identified through MnDOT's performance based planning process and were developed to be eligible for federal funding (i.e. followed the NEPA process).

VI. Program Contacts

If you have additional questions about the Corridors of Commerce Program, please feel to contact one of the individuals below.

Patrick Weidemann
Director of Capital Planning and Programming
MnDOT Office of Transportation System Management
(651) 366-3758 or (320) 214-6365
pat.weidemann@state.mn.us

Appendix B: 2018 Program Effectiveness Evaluation

This appendix provides the results of an evaluation of the Corridors of Commerce program. The discussion includes analysis and methodology details. As directed in the statute, the evaluation was performed by MnDOT staff independent of those who oversee regular program implementation.

As of August 2018, there were 13 projects funded through previous rounds of the program that are substantially complete and open to traffic. These include the nine projects funded through the initial 2013 Corridors of Commerce program (listed in Table 2), two of the projects funded by fiscal year 2014 legislation and two from fiscal year 2015. The 2014 projects include the reconstruction of Highway 2 through the city of Deer River and the addition of a center left turn lane along Highway 34 in the city of Detroit Lakes. The 2015 projects include the two to four-lane expansion of Highway 371 from Nisswa to Jenkins and a mill and overlay project on Highway 34 in and near Detroit Lakes. The Highway 34 project was bundled together with the 2014 turn lane project for contracting and construction efficiency and will be treated as a single project for evaluation purposes. Together, these projects form the set of evaluated projects.

Evaluation Criteria and Considerations

The 2015 legislative report on Corridors of Commerce[4] lists the following criteria that were applied to candidate projects in 2013 after pre-screening for delivery time frame and amount of additional funding required:

- Construction start date
- Relative return on investment
- Travel time improvement
- Local support
- Multimodal connections

The first three factors translate most readily to quantitative comparisons, which are the appropriate starting points in choosing the objective measures used for this evaluation. The target measures are identified below. The recent completion of some Corridors of Commerce projects means before/after data is not yet available in some cases. The comparison data is also limited because there are projects approved for Corridors of Commerce funding in subsequent years that partially overlap areas already improved by the 2013 projects. These overlaps are noted where they occur.

Projects are judged by whether they are performing in line with expectations with respect to the following:

- Construction timing and duration
- Construction cost
- Vehicle speeds
- Crash incidence and severity
- Heavy commercial vehicle traffic growth

Even where data exists to allow for comparisons between (1) the scoping and selection phase and (2) early post-opening operations on the facility, strict causality cannot be reliably assigned to each improvement funded under

[4] Minnesota Department of Transportation, "2015 Report on the Corridors of Commerce Program", (see bottom of page 5).

Corridors of Commerce. This is due to the difficulty of controlling for all other behavioral, economic, engineering and sample size considerations.

Instead, the analysis seeks correlations and directional trends to understand how the priorities advanced by the Corridors of Commerce legislation are being brought to life.

Lastly, while all 13 of the projects identified for evaluation are effectively complete and open to traffic, the set of projects available for evaluation on each of the five criteria listed above will vary depending on data availability, timing of project completion and applicability. All projects will be evaluated on the construction timing and cost criteria but some of the projects will necessarily be left out of the analysis of the other three criteria.

Each project is populated with the best available estimates and projections, most specific and closest to the time of construction. In most cases, the planning or predicted values dating from the time of project selection are obtained from high-level modeling conducted by MnDOT's Office of Transportation System Management. For any projects with more detailed third-party consultant studies preceding construction, those results are shown here and supersede the preliminary planning inputs.

Construction Timing and Duration

Table 13 checks the actual beginning and endpoints of construction against the timing anticipated during project selection. (Expectations for duration or construction finish were not then established or known.) The construction schedule is defined as running from when traffic on the corridor first experiences road work impacts such as reduced speeds, temporary lane reconfigurations and related disruption. Similarly, the end of construction is considered to be the time when free-flow conditions are restored, as confirmed with project managers. This timing may not coincide with the dates specified in the contract in every case, due to preparation and wrap-up work undertaken that does not noticeably affect the roadway environment.

Table 13: Completed Project Construction Dates

District	Route	Potential Start Time Frame (estimate)	Contract Letting Month	Construction Start Month	Construction End Month
2	Hwy 2	2016 - 2018	Aug. 2014	Oct. 2014	Oct. 2015
3	I-94	2016 - 2018	May 2014	July 2014	Oct. 2015
4	Hwy 34	2014 - 2015	June 2014	Aug. 2014	Nov. 2015
6	Hwy 14	2014 - 2015	Apr. 2014	July 2014	Oct. 2015
7	Hwy 14	2016 - 2018	May 2015	June 2015	Nov. 2016
8	Hwy 23 (North)	2016 - 2018	Apr. 2016	June 2016	Oct. 2016
8	Hwy 23 (South)	2016 - 2018	Oct. 2015	May 2016	Aug. 2016
1	Hwy 169	Summer 2016	June 2016	Sept. 2016	June 2018
M	Hwy 610	2014 - 2015	Aug. 2014	Oct. 2014	Oct. 2016
M	I-694	Spring 2016	Nov. 2015	Feb. 2016	Sept. 2017
2	Hwy 2	Summer 2017	Mar. 2017	June 2017	Aug. 2017
4	Hwy 34	Summer 2016	Feb. 2016	July 2016	Aug. 2017
3	Hwy 371	2016 - 2017	Oct. 2015	Feb. 2016	Oct. 2017

All of the projects listed meet the broad guidelines specified for groundbreaking, and two of the projects were finished before the first year shown in their preliminary start schedules. These comparisons justify the high deliverability rating assigned to the awarded projects. Note also that the project adding several passing lane segments along Highway 23 in District 8 was split into two separate sponsored projects, identified in Table 13 as the north and south sections. Accordingly, these two projects are treated separately in this instance, since they were conceived with different start and contract letting dates; however, for the remaining sections of the analysis not related to project delivery, these two projects will be treated as a single project

Construction Cost

Table 14 compares project cost estimates recorded at four major development stages. Chronologically from earliest to most current, the snapshots describe the cost progression from: the original construction estimate;[5] the pre-letting engineer's estimate; the awarded contractor bid; and the final total payment by MnDOT to the contractor (designated as the 95 percent or more complete value certified amount).

Table 14: Completed Project Construction Cost Comparison (millions)

Route	Original (2013) Construction	Engineer's Estimate (EE)	Awarded Bid (BID)	Final Amount (FINAL)
Hwy 2 (Passing lanes)	$10.5	$10.8	$13.3	$14.1
I-94	$32.4	$30.6	$28.3	$28.4
Hwy 34 (Passing lanes)	$10.0	$9.0	$7.9	$8.5
Hwy 14 (East of Owatonna)	$15.0	$12.6	$12.0	$11.2*
Hwy 14 (Mankato to Nicollet)	$38.5	$31.2	$31.7	$33.6
Hwy 23 (North)	$10.9	$4.1	$3.9	$3.8
Hwy 23 (South)	$10.9	$4.3	$4.1	$4.3
Hwy 169	$8.3	$6.7	$5.9	$6.3
Hwy 610	$100.3	$83.6	$80.7	$80.3
I-694	$42.3	$35.0	$34.7	$35.0
Hwy 2 (Reconstruct)	$1.5	$1.9	$2.2	$2.5
Hwy 34 (turn lanes)	$3.7	$2.7	$2.6	$2.6
Hwy 371	$41.9	$56.9	$49.9	$50.2

*Highway 14 was rated as 99 percent complete as of September 2016 showing a 7 percent savings against encumbered dollars pending final contractor review due in November.

Note that in Table 14 the original construction cost estimates for the north and south segments of the Highway 23 passing lanes project are identical. This reflects the original construction cost for the project applying to the entire corridor, including both segments. Also, as noted previously, the Highway 34 turn lanes project was combined with a mill and overlay project on a concurrent section of the highway. So, the original construction cost estimate reflects the combined estimates for both project components rather than just the construction of the turn lanes.

[5] 2013 estimates were presented in the "Construction Letting (Estimate)" field of Figure 1 on page 6 of the 2015 Report on the Corridors of Commerce Program and exclude project delivery expense.

Findings

For all projects, except the two projects located on Highway 2, none of the engineer's estimates, awarded bids or final amounts are greater than the original construction estimate. This is one indicator of desired cost control and oversight. In other words, no more resources were consumed at later project stages than what was initially expected at the time of project selection. Additionally, only these two projects and the expansion of Highway 14 between North Mankato and Nicollet resulted in awarded bids and/or final amounts that were above the engineer's estimate. The final amounts for construction cost all remain fairly closely to the awarded bid amounts. Only in one instance (the Highway 2 reconstruction project in Deer River) does the final amount exceed the awarded bid by more than 10 percent.

Only for the pair of Highway 2 projects do estimated and actual costs continually increase over the course of project preparation and execution from the low of the original estimate to the final amount. The biggest escalation in cost of $2.5 million (24 percent of the original estimate) occurs between the engineer's estimate and awarded bid values for the passing lanes project. In contrast, the largest increase in cost for the Highway 2 reconstruction project occurs earlier in the project development process, between the original construction estimate and the development of the engineer's estimate.

Vehicle Speeds

Another requirement of the Corridors of Commerce legislation is that project selection must consider "efficiency in the movement of freight, including… measures of congestion or travel time reliability."[6] Although recurring reliability problems such as weather events or rush hour backups affect vehicle speeds, these types of events have at most a secondary influence on most of the Corridors of Commerce candidate routes, because these projects are located outside of the Twin Cities metro area and do not experience significant congestion-related delays or travel time variability. The measurement of reliability remains less systematic and routine than other traffic benchmarks, although progress is being made through pilot research led by MnDOT's Metro District that draws on new data collection technology to obtain, validate and report regular, widespread reliability information in the future. For these reasons, travel efficiency is chiefly judged by reference to average vehicle speeds, recorded for autos and trucks.

Required decades ago as a condition for receiving federal highway funding, speed monitoring was left up to state discretion in 1995, and since then has been carried out as a voluntary service by MnDOT to facilitate statewide analysis. Speed monitoring generally involves two methods to collect data. Fixed-point automated speed monitoring stations continuously collect geographically dispersed data for all state-owned roadway classifications—urban and rural, divided/undivided highways and limited-access freeways. Average travel speeds have traditionally been estimated on the basis of vehicle volume, capacity and presence of intersection traffic control. More recently, the availability of data from global positioning system, GPS, readings from smartphones and on-board navigation units is providing a new source of speed data with better spatial coverage and more regular reporting.

Overlapping with Corridors of Commerce improvements around the state, a multiyear review is under way of speed limits governing two-lane highways having a posted limit of 55 miles per hour. The study, required by a 2014 law[7], was initiated in 2014 and is scheduled to continue through 2018. For each qualifying location, the review considers engineering and safety criteria to determine the appropriateness of raising the posted speed limit to 60 miles per

[6] Minn. Stat. 161.088, subd. 5.
[7] Laws 2014, Chapter 312, art. 11, sec. 36

hour. A current year-by-year list of routes that have been or will be evaluated is contained in the latest status report published in January 2018.[8]

None of the Corridors of Commerce roadways analyzed in this report have yet been subject to the speed limit review, removing the possibility that observed prevailing speeds were influenced by an external change (i.e. a higher posted speed limit) unrelated to the Corridors of Commerce improvement. However, some projects that have been added to the set evaluated in this report are currently under review and may see changes to statutory limits in the near future. These include portions of Highway 34 east of Detroit Lakes and Highway 371 north of Nisswa.

The most recent speed limit report makes a point equally relevant to the Corridors of Commerce assessment about the nature of the relationship between faster allowed speeds and resulting safety outcomes:

> *It is important to remember that raising a posted speed limit is not inherently making a road "less safe." A properly selected speed limit can increase the safety of the roadway by creating uniform travel speeds for all vehicles, and by setting realistic driver expectations of those trying to cross or enter the roadway.*[9]

In other words, there is not necessarily a tradeoff between speed and safety of travel. This uncertainty supports the independent testing within each completed corridor of the speed and safety criteria described in this evaluation.

When investigating typical, representative speed conditions, there are two common reporting practices depending on context. Return on investment modeling, including the modeling that is run during Corridors of Commerce screening, adopts the simple arithmetic mean for an average measure, dividing vehicle miles traveled by vehicle hours traveled. Alternatively, engineering analysis of speed differentials for individual vehicles shows summary statistics in percentile terms, which has the effect of minimizing the impact of extreme but rare high- and low-speed (e.g. farm tractor) observations. Both types of speed measures will be checked here.

Since there are so many vehicles traveling at very similar speeds clustered around the posted speed limit, before-and-after mean speed comparisons tend to show larger changes rather than when using an equivalent percentile measurement. Likewise, speed changes will be greater when focusing on peak time-of-day travel—defined as 6 to 9 a.m. and 4 to 7 p.m.—instead of 24-hour averages that include relatively uncongested intervals. To understand the magnitude of improvement under the high-traffic conditions of greatest concern to drivers, the actual speed data that follows is restricted to peak hours. Obtaining custom, timely actual speed information has historically been difficult, until the introduction of a still-emerging breakthrough technology application developed to advance regulatory effectiveness. As part of the Federal Highway Administration's National Performance Management Research Data Set, also called NPMRDS, private sector probe data is available for analysis by public agencies at the federal, state and municipal levels on a near-real time basis. Specifically, actual average travel times—and by extension vehicle speeds—are reported around the clock and throughout the year in monthly data tables containing fine detail by time-of-day (down to five-minute slices). Roadway network coverage consists of all Corridors of Commerce locations selected to date. Travel time information is obtained from smartphones, dedicated navigation devices, integrated personal vehicle technology and freight fleet reporting coordinated by the research division of the largest national trucking trade association.

[8] Minnesota Department of Transportation, "2017 Report on the Evaluation of Certain Highway Speed Limits," Jan. 2016.
[9] Ibid., p. 7

Analysis of Vehicle Speeds

Table 15 contains speed information for each evaluated Corridors of Commerce project. Columns on the left display the absolute mean speeds estimated under baseline capacities and predicted after the Corridors of Commerce enhancements. The rightmost columns provide actual NPMRDS speed point estimates recorded at peak times and averaged across all vehicles for the first six months[10] of 2014 and 2018. Given the staggered construction start and end dates for the projects under evaluation, these two six-month periods capture pre- and post-construction conditions for nearly all projects while also controlling for seasonal effects. Exceptions include the Highway 169 expansion project near Taconite, which was not officially completed until June 2018, and the completion of Highway 610 which, as a new construction project, has no data representing pre-construction conditions. The Highway 2 reconstruction in Deer River is also excluded, as the project contained no operational improvements that would be expected to affect vehicle speeds.

Table 15: Comparison of Estimated/Predicted and Observed Mean Vehicle Speed Estimates[11]

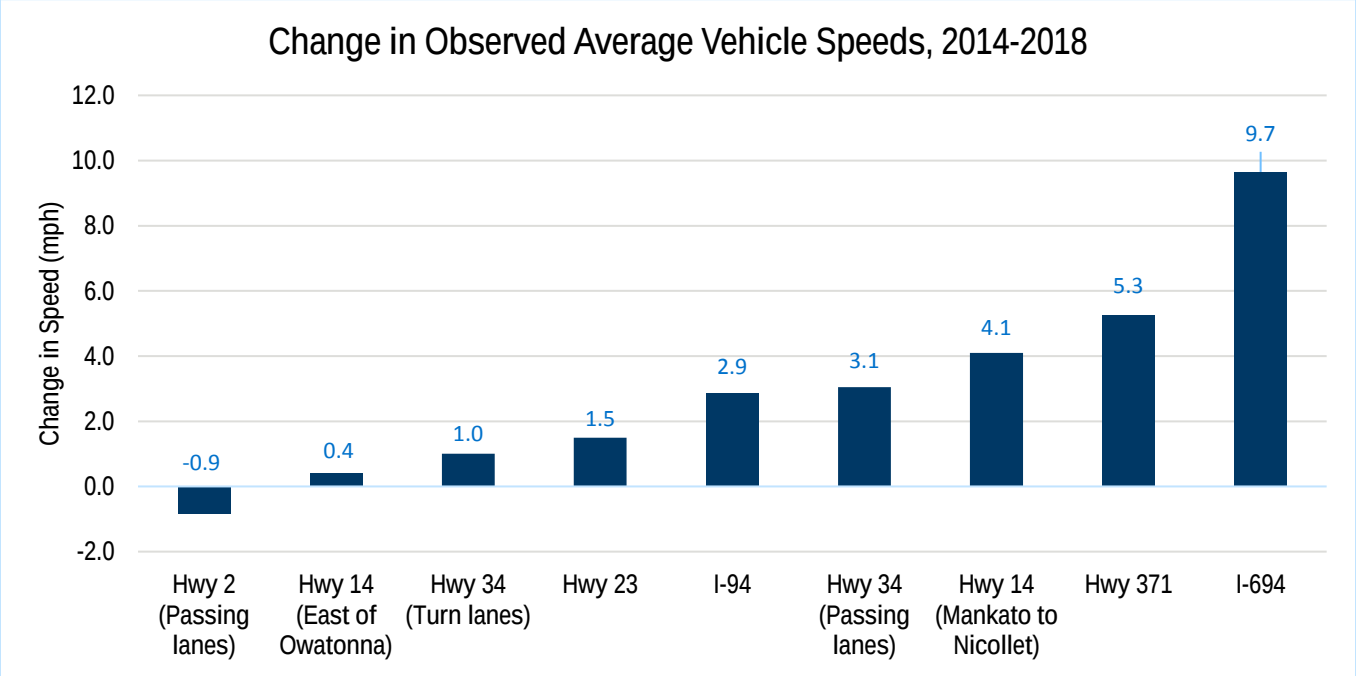
Route	Estimated/Predicted (absolute mean speeds)				Observed Auto +Truck Combined Peak Periods (actual NPMRDS recorded speeds)	
	AUTO		TRUCK			
	Baseline	Improved	Baseline	Improved	Jan. - June 2014	Jan. - June 2018
Hwy 2: Passing Lanes	55	60	55	55	54	53.1
I-94	62	70	62	65	61.1	63.9
Hwy 34: Passing Lanes	50	55	50	50	49.8	52.9
Hwy 14: East of Owatonna	55	65	55	65	62	62.4
Hwy 14: Mankato to Nicollet	55	65	55	65	54	58.1
Hwy 23	55	60	55	55	53.8	55.3
Hwy 34: Turn Lanes	30	30	30	30	26.6	27.6
Hwy 371	52	60	52	60	47.3	52.6
I-694	60	60	60	60	43.5	53.2

Figure 1 below spotlights the observed changes in speed for autos and trucks, comparing the January through June period of 2014 to the same period in 2018. Ascending or positive data points, indicating higher speeds in the current time frame, are desirable.

[10] The NPMRDS speed data series begins in July 2013, making the presence of some winter months unavoidable in the pre-construction baseline. Future evaluation iterations can test the stability of post-construction speed snapshots so as to qualitatively control for unusually severe or mild winters.

[11] Because sample size is suppressed in the NPMRDS data made available, a margin of error cannot be calculated for observed speeds. Everything else being equal, higher-volume roads will have more precise estimates.

Figure 1: Change in Peak-Period Vehicle Speeds (Passenger Cars and Trucks) for January-June 2014 Compared to January-June 2018



Findings

The results displayed in Figure 1 indicate that all but one of the projects examined here showed at least some observed increase in average speeds between the first half of 2014 and 2018. Highway expansion projects tended to show the largest increase in average peak-period speeds among those sampled. The most dramatic increase in speeds was observed on Interstate 694 between Lexington Avenue and I-35E, where average peak-period speeds increased by nearly 10 miles per hour during the observation period. The next-largest speed increases were recorded on Highways 371 and 14 between Mankato and Nicollet. Both of these projects involved capacity expansion from two to four lanes with a bypass segment.

The passing lane projects examined tended to show smaller, though mostly positive changes in speeds. In addition, the segment of Highway 34 through Detroit Lakes where center-running left turn lanes were installed showed a modest, one-mile per hour increase in average peak speeds.

There are a couple of somewhat inconsistent results drawn from the observed speed data. The project on Highway 14 involving expansion from two to four lanes showed only a minor (0.4 mile per hour) increase in speeds despite an increase in the posted speed limit from 55 to 65 miles per hour on the expanded segment. The best explanation for this finding may be that the expanded segment, which is only approximately three miles in length, makes up only a fraction of the length of the segment for which speeds were measured. This mismatch between the improved segment and the roadway segment for which speeds are observed means that reported average speeds for this segment also capture a portion of the segment that remains as a two-lane facility with a correspondingly lower speed limit (55 miles per hour), therefore dragging down the average speed.

The other unusual result was the reported decrease in speeds on Highway 2, where passing sections were constructed between Cass Lake and Deer River. The decrease was small in absolute terms (0.9 mile per hour), but consistent with the previous Corridors of Commerce evaluation study, which examined observed changes in speeds between 2014 and 2016. One possible explanation for this finding is that the relatively low traffic volumes, coupled

with low GPS and wireless penetration rates, resulted in a small change in observed average speeds that lies within the margin of sampling error. However, without adequate information on sampling rates, especially for the earlier part of this study period, this explanation is difficult to confirm.

The current analysis of vehicle speed data combined probe readings from both commercial trucks and passenger vehicles. There is a transition between different vendors of the speed data and accompanying changes in the processing of this data into average speed calculations, so it was not possible to separate truck data for the purposes of analysis in this study. In future editions of this report, separate analyses of changes in speeds for different classes of vehicles are expected.

Crash Incidence and Severity

One of the mandatory Corridors of Commerce project selection criteria is "improvements to traffic safety." Adding to the overriding importance all highway users assign to safe travel, routes with significant commercial traffic volumes warrant further attention in a safety review. Differences in speed and acceleration/deceleration characteristics and reduced visibility around large vehicles, in combination with individual driver decisions, can produce hazardous conditions in certain weather, topography and roadway configurations. Building new lanes to create protected passing opportunities and promote increased vehicle separation is intended to mitigate some of this complex risk interaction.

Analysis of Crashes

MnDOT's Office of Traffic, Safety and Technology reports detailed trunk highway crash statistics in annual Crash Data Toolkit spreadsheet files. Drawing on records from the Department of Public Safety's Crash Facts, the toolkits are published midyear with data through the prior calendar year, and compile three, five and 10-year crash counts. Separate files cover intersections and corridor sections segmented by reference points. Crashes are categorized by severity according to the following coded scale:

- Fatal (K) – crash resulted in at least one fatality
- Incapacitating Injury (A) – crash resulted in at least one life-critical injury
- Non-incapacitating Injury (B) – crash resulted in at least one severe or clearly determined injury
- Possible or Unknown Injury (C) – crash may have resulted in an injury that was not diagnosed at the scene
- Property Damage Only (PD) – crash resulted in no apparent or recorded injuries but caused damage to vehicle(s) or other property

The Corridors of Commerce safety baseline was established from the 2015 Crash Data Toolkit by summing the 10-year section crash counts for the segments in the vicinity of the project scope. This information is shown in Table 10 below in raw form to ease traceability from the source file.

Table 16: Baseline 10-Year Crash Totals (2006-2015)

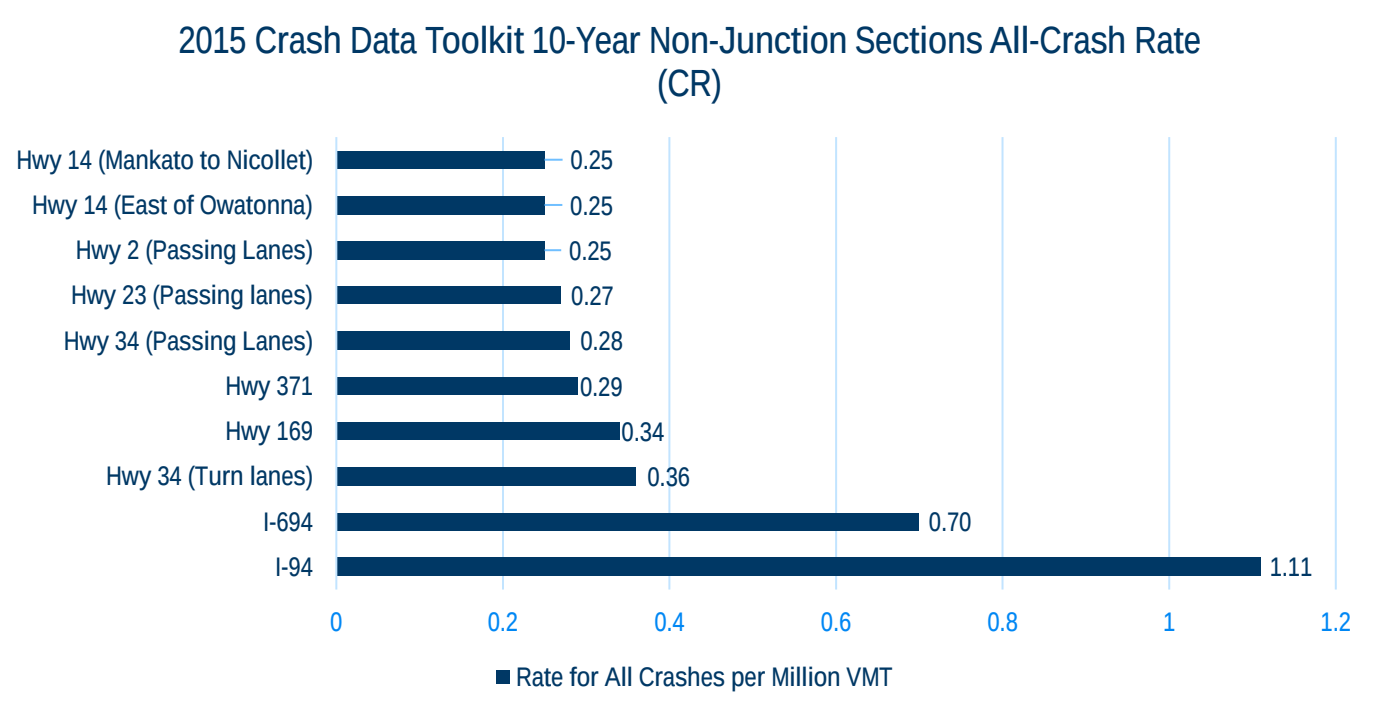
Route	Fatal Crashes	Injury A Crashes	Injury B Crashes	Injury C Crashes	PD Crashes
Hwy 2: Passing Lanes	5	6	4	28	50
I-94	2	3	45	149	625
Hwy 34: Passing Lanes	5	5	50	48	125
Hwy 14: East of Owatonna	3	5	9	22	73
Hwy 14 (Mankato to Nicollet)	3	2	19	11	70
Hwy 23	16	11	50	85	322
Hwy 169	1	1	10	10	32
I-694	4	3	55	219	1013
Hwy 34: Turn Lanes	0	0	4	1	8
Hwy 371	0	2	10	29	68

Absent from Table 16 are the Highway 610 project and the reconstruction of Highway 2 in Deer River. The Highway 610 project is excluded since it represents an entirely new link in the highway network and has no historical crash data. The Highway 2 project in Deer River is excluded because its scope does not include any major safety-related improvements that would be expected to affect crash rates.

Because the traffic volumes—and resulting opportunities for conflict—vary substantially across the approved route improvements, an alternate crash rate measure that incorporates vehicle miles traveled gives a more instructive comparison within the project set.

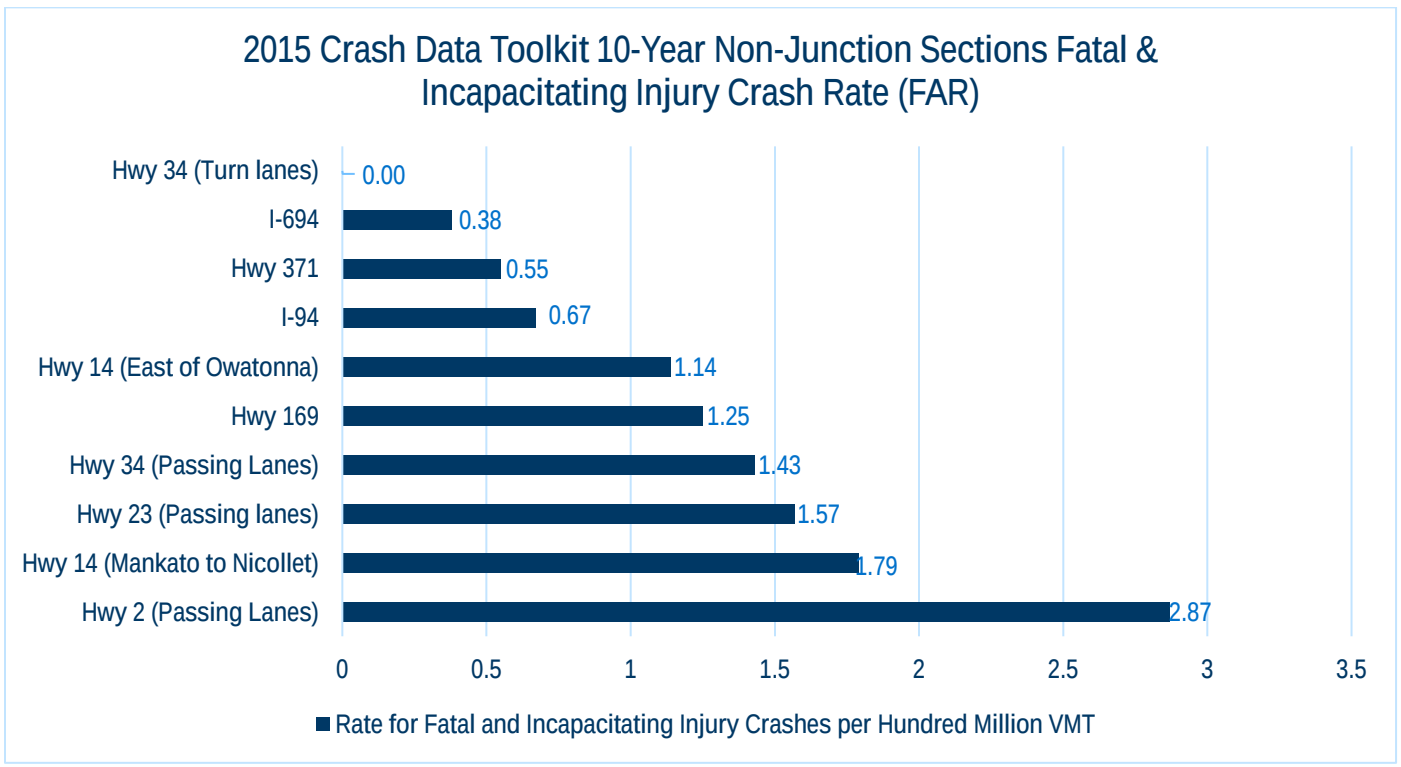
Looking at all crash types in Figure 2, 10-year crash rates for most of the project areas fall within the range of 0.25 to 0.36 crashes per million VMT. The two notable exceptions are the projects on the interstate system in and near the Twin Cities area. The I-94 segment all-crash rate of 1.11 per million vehicle miles traveled is the highest among all of the project corridors, while the crash rate for I-694 between Lexington Avenue and I-35E is 0.70, a rate much closer to the statewide 10-year average for urban freeway segments of 0.74.

Figure 2: 10-Year Rate for All Crashes (Any Severity) per million VMT (2006-2015)



This ordering is largely reversed, however, after applying a filter on crash severity to isolate fatal and incapacitating injuries, Class A injury events. This is captured by the fatal an incapacitating injury crash rate statistic, illustrated in Figure 3.

Figure 3: 10-Year Rate for Fatal and Serious Injury Crashes per hundred million VMT (2006-2015)



In this case, the metro area freeway projects record two of the lower FAR rates among the projects funded by Corridors of Commerce. Conversely, several of the corridors where passing lane projects were constructed recorded among the highest FAR rates from 2006 to 2015. Also of note, the segment of Highway 34 through the city of Detroit Lakes where center left turn lanes were constructed experienced no fatal or serious injury crashes during the 10-year period ending in 2015.

The contrast between CR and FAR highlights the importance of including overall crash incidence and the severity when interpreting safety performance and rating the effectiveness of countermeasures. A safety-oriented project may be considered successful to the extent it reduces either or both: (1) total crash frequency across all severities, and (2) just fatal and A injury crash occurrences. Because the Corridors of Commerce legislation does not explicitly single out either of these objectives or prescribe a desired tradeoff between them (for instance, that FAR reduction should be prioritized even if accompanied by a higher all-crash incidence), each goal will be examined independently.

When projecting future safety data, it is customary to assume a near-term continuation of historical crash rates in the baseline, unimproved scenario. This is a different approach than that taken for traffic volume where background economic and population growth typically justify an assumption of increasing driving levels under all scenarios over the long run. Even in the absence of changes in crash rates, one would expect to see increase in total crash counts assuming continued increases in VMT. Evaluating the safety impacts of the projects under consideration therefore requires adjustment to account for these changes in traffic levels. To simplify the data comparison then, and because more severe crashes can be rare events on lower volume roads, aggregated crash rates such as CR and FAR are more reliable in the statistical sense than raw crash counts at each level of severity.

In general, estimating the expected crash rates resulting from each new Corridors of Commerce investment follows a two-step procedure:

a. Determine the reasonable scope of the investment's effect on safety. The boundaries for crash data segments are commonly set by access points and changes in posted speed limits. Planning-level estimates concerning roadway expansion for part of a longer segment requires pro rata downscaling of the reported data, assuming an even distribution of crash incidents throughout the segment.

b. Additionally, the benefit of some safety features can be anticipated to extend beyond the physical limits of the project. In the case of the two rural passing lane projects studied here, safety projections adopted the principle recommended by Missouri's state transportation agency that the zone of reduced crash risk continues two miles downstream from the endpoint of each passing lane.

c. Apply an appropriate crash modification factor to the determined scope. Crash modification factors represent the crash frequency that analysis suggests would remain following the introduction of a safety improvement. It is represented as a decimal (less than 1) factor associated with each severity category. Multiplying a baseline crash count by the corresponding crash modification factor yields modeled future crashes.

d. The Federal Highway Administration sponsors the CMF Clearinghouse to collect and share crash modification factor results from academic researchers and transportation agencies across the country. In the absence of well-documented experience with crash impacts of passing lanes added to Minnesota highways, a search of the CFM Clearinghouse discovered suitable national crash modification factors describing safety benefits from the

implementation of periodic passing lanes in a rural setting. A closer match on the attributes of Highway 14's expansion was made with other in-state projects, allowing its crash modification factors to be calculated as averages of the factors published in benefit-cost memorandums for three segments also competing for Corridors of Commerce funding—two of which were also approved.

One exception to the above approach among the now-completed Corridors of Commerce projects is the I-94 expansion. Due to its integration within the dense Twin Cities metro arterial road network, the safety benefit attributable to this interstate investment is computed in tandem with the regional travel demand traffic model. (This is detailed in the refined benefit-cost study performed by a consultant following the project selection stage.) In line with past urban projects, where multiple driving paths connect major origin-destination pairs, the improvement to safety from new I-94 capacity hinges on attracting trips away from using other routes (such local roads) and onto the interstate highway. In general, parallel minor highways and surface streets have higher crash rates compared to the interstate system. Due to reduced congestion on and around the widened I-94 section, drivers who had formerly avoided use of the interstate in peak hours will return to the corridor to find shorter travel times and, secondarily, benefit from a lower severe crash risk.

Because the safety benefit on I-94 is tied to redistribution of traffic throughout a road network that extends beyond the interstate itself, it would be unexpected to observe a reduction in crash counts or rates for that specific I-94 segment in crash data. Despite inability to directly confirm the modeled improvement in safety, crash statistics from before and after the lane addition can be compared to detect any actual change in safety on the isolated interstate section. It should also be noted that safety considerations play a relatively minor role in the I-94 business case, making up less than 7 percent of the total estimated present value of user benefits.

Table 17: Raw Crash Rate Forecasts and Associated 2015 Statewide Average Benchmarks (bolded)

Route/Facility Type	Non-Junction Sections All-Crash Rate (CR)	Non-Junction Sections Fatal & Incapacitating Injury Crash Rate (FAR)
Hwy 2: Passing Lanes	0.17	2.04
Hwy 23	0.2	1.25
Hwy 34: Passing Lanes	0.19	1.29
Hwy 34: Turn Lanes	0.29	0
3-Lane Undivided	**0.58**	**0.44**
I-694	0.59	0.29
Urban Freeway	**0.74**	**0.43**
I-94	0.94	0.51
Rural Freeway	**0.42**	**0.72**
Hwy 14: East of Owatonna	0.2	0.63
Hwy 14: Mankato to Nicollet	0.2	0.98
Hwy 169	0.27	0.69
Hwy 371	0.21	0.3
Rural Expressway	**0.34**	**0.76**

Table 17 lists the new raw crash rate reference levels produced from the methods described above. In addition to forecasting build scenario CR and FAR values for each Corridor of Commerce location on the basis of scope and crash

modification factor calculations—or a continuation of historical performance, in the case of I-94—the table gives contemporary (10 years ending in 2015) historical statewide averages corresponding to the new facility type, specified by environment (rural or urban), design (freeway, expressway or other), and lane count attributes. Taken together, the raw corridor forecast, historical statewide facility average and future statewide facility average will generate an adjusted corridor forecast against which future safety data can be evaluated, through the following formula:

Raw Corridor Forecast + (Future Statewide Facility Average – Historical Statewide Facility Average) = Adjusted Corridor Forecast

By modifying each corridor's raw crash rate forecasts with the difference over time in statewide average rates for the upgraded facility type, the intent is to pinpoint the change in corridor crash rate due to the Corridors of Commerce investment while setting aside broader safety trends influenced by a host of unrelated factors. As previously mentioned, the standard short-run assumption is that there is no change in crash rates; however, if a rate increase or decrease does emerge between the time forecasts are established and when validation data becomes available years later, then this variance will be removed. Considering the modest improvements contained in the raw corridor forecasts, even a small correction using the statewide averages will assist with proper assessment of whether the expected safety improvement has materialized. This central yes/no comparison should be supplemented by measuring the size of the gap between actual and forecast performance—better or worse—as a basic gauge of the confidence that can be had in drawing a positive or negative conclusion, lacking a formal statistic to control for sampling error.

Illustrating this with hypothetical numbers, suppose that the 2018[12] edition of the Crash Data Toolkit indicates that the Highway 2 sections including and bookending the passing lane locations has most recently averaged a CR of 0.18 and FAR of 2.13, while the statewide benchmark for all three-lane undivided facilities now stands at 0.60 for CR and 0.52 for FAR. The two evaluation tests are then as follows:

CR: $0.18 \ \{<=>\} \ 0.23 + (0.60 - 0.58)$

$0.18 < 0.25$

- Interpretation: the observed all-crash rate is moderately lower than the level assumed at the time of project selection.

FAR: $2.13 \ \{<=>\} \ 2.10 + (0.52 - 0.44)$

$2.13 < 2.18$

- Interpretation: the observed top-severity crash rate is slightly lower than the level assumed at the time of project selection, but the comparison is within the range of sampling variability, particularly given the limited three-year history now available (written in future perspective).

The illustrated example above uses statewide average crash rate data from the 2015 Crash Data Toolkit as the baseline for historical crash rates in order to demonstrate the adjustment that must be made to account for broader changes in safety conditions for types of roadways across the state. As of the time of this writing (October 2018), this

[12] 2018 is the first year when the shortest crash statistic interval of three years will consist entirely of post-Corridors of Commerce construction safety performance, to be reported in mid-2019.

data set remains the most recent official set of crash statistics for the state. The statewide, facility-specific crash rates, combined with the forecasts of crash rates incorporating the expected effects of safety improvements due to changes in roadway design or operation, provide a framework for the analysis of the safety effects projects funded via the Corridors of Commerce program. However, as mentioned in the note above, a more complete understanding and evaluation of these safety effects cannot be fully carried out until more recent (2018 or later), official crash rate data become available.

Freight Movement Growth

The statute governing the Corridors of Commerce program lists "freight improvement" as one possible project classification:

> (2) freight improvement, for an asset preservation or replacement project that can result in:
>
> (i) removing or reducing barriers to commerce
>
> (ii) easing or preserving freight movement;… [13]

Five of the projects completed to date, including passing lane additions on Highways 2, 23 and 34 received this designation, while the others were primarily considered "capacity development" work.

The law identifies project selection criteria, including:

> (3) efficiency in the movement of freight, including but not limited to:
>
> (i) measures of annual average daily traffic and commercial vehicle miles traveled, which may include data near the project location on that trunk highway or on connecting trunk and local highways;…[14]

To address the freight movement aspect of Corridors of Commerce performance, a trend analysis was generated for heavy commercial vehicle traffic on each affected corridor. Review of these traffic patterns—particularly in future evaluation summaries, once initial post-opening data becomes available—will provide a gauge of how the Corridors of Commerce improvements may have contributed to the corridors' relative attractiveness on the statewide freight network.

Bearing in mind that market factors can influence freight volumes independent of road infrastructure characteristics, placing the Corridors of Commerce investment in context along a longer timeline demonstrates how the current trajectory for truck traffic measures up against the historical benchmark.

Annual average daily traffic data is collected for trunk highway segments on a rotating basis approximately every other year. The intent is to capture typical prevailing conditions and avoid construction-related anomalies. A variety of methods are then employed for classifying vehicles to estimate truck volumes, expressed as heavy commercial annual average daily traffic. (Data for corridors that span multiple road segments can be calculated by averaging the HCAADTs for each shorter segment and weighting by segment length.) Details on these procedures can be found online from the Traffic Forecasting & Analysis unit of MnDOT's Office of Transportation System Management, which publishes the data presented below.

The related measure of heavy commercial vehicle miles traveled simply combines road segment length with vehicle counts registered at specific points within the segment. For instance, two trucks traveling a five-mile segment yield a total of 10 HCVMT. Statewide HCVMT serves as a control or normalization factor for corridor-level HCAADT figures so

[13] Minn. Stat. 161.088, subd. 3.
[14] Minn. Stat. 161.088, subd. 5.

that the adjusted HCAADT values can be directly interpreted as traffic changes particular to a given corridor, after netting out average "background" traffic growth observed across Minnesota.

Table 18—divided into two parts—and Figure 4 gives an example with hypothetical data to simulate this adjustment process.

Table 18.1 contains an illustrated HCVMT trend for the period 2008 to 2016, with annualized growth rates ranging from 1 percent to 5 percent. The "HCVMT Index" column values are the result of dividing each year's HCVMT by the constant 2008 level of 2.50 billion. For instance, the 2013 HCVMT of 3.04 billion is 22 percent higher than the 2008 amount, producing an index reading of 1.22. Note that the years 2014 and 2015 are missing from this table. Due to the development and implementation of replacement database systems during this period, official statewide VMT estimates are not available for these years.

Table 18.1: HCAADT Normalization Example

Year	State HCVMT (billions)	Annual HCVMT Growth Rate	HCVMT Index to 2008
2008	2.5	-	1
2009	2.58	3%	1.03
2010	2.7	5%	1.08
2011	2.81	4%	1.12
2012	2.95	5%	1.18
2013	3.04	3%	1.22
...	-	-	-
2016	3.13	1%	1.25

Table 18.2: HCAADT Normalization Example (continued)

Year	Years Before (-) / After (+) Construction	Corridor XYZ Raw HCAADT	Raw Annual HCAADT Growth Rate	HCAADT Adjusted for State HCVMT	Adjusted Annual HCAADT Growth Rate
2008	-6	3,000		3,000	
2009	-5	3,120	4%	3,029	1%
2010	-4	3.245	4%	3,004	-1%
2011	-3	3.31	2%	2,955	-2%
2012	-2	3,376	2%	2,861	-3%
2013	-1	3,410	1%	2,795	-2%
...	...	-	-	-	-
2016	1	3,618	2%	2,895	1%

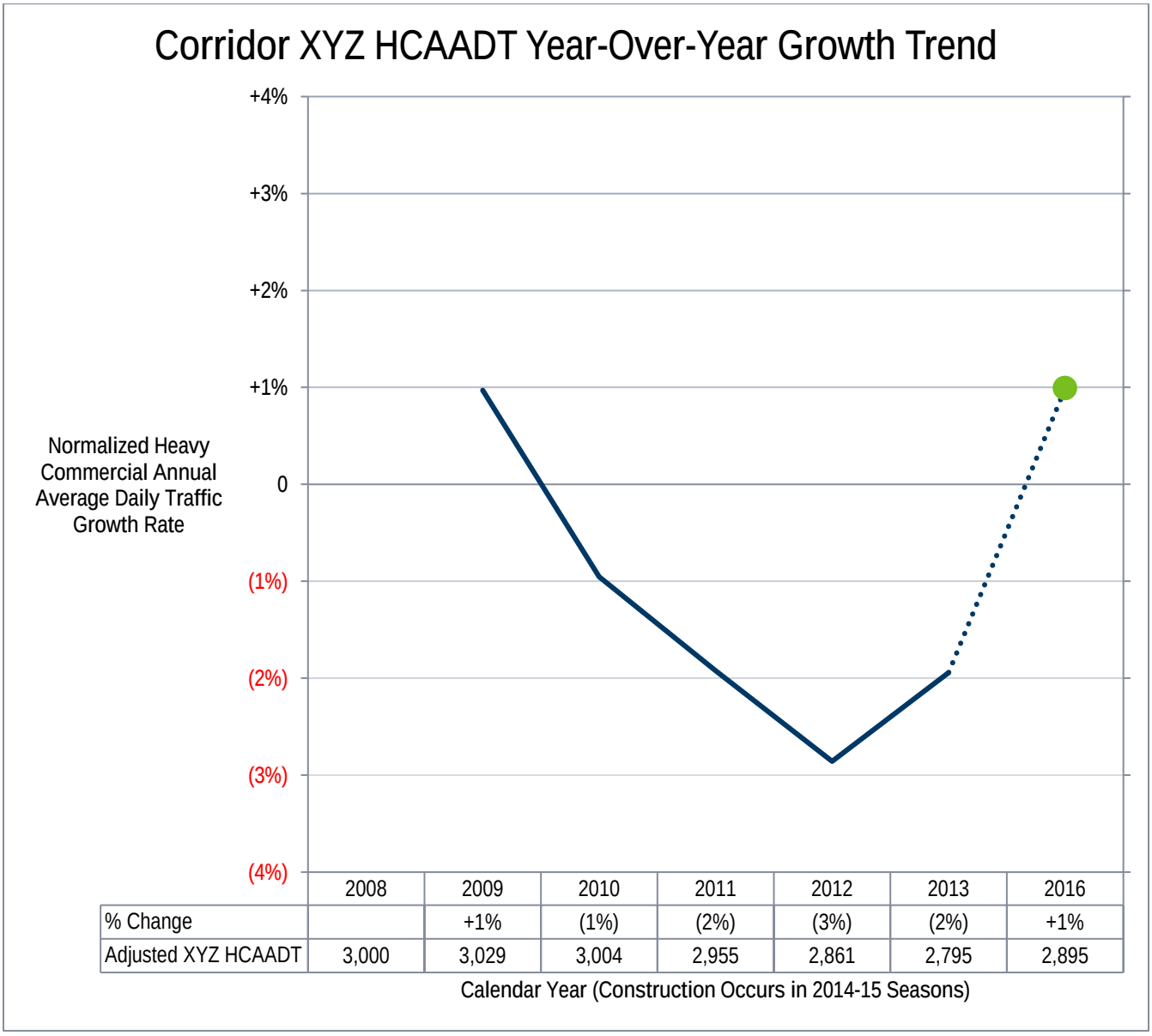
The second part, in Table 18.2, shows corridor HCAADT history for a number of years before construction and the first year after project completion. Construction lasted for two seasons (2014 and 2015) in this example. "Raw HCAADT" lists the actual reported traffic numbers alongside the resulting growth rate over the prior year. Finally,

"HCAADT Adjusted for State HCVMT" divides raw HCAADT by the HCVMT index value in that year. For instance, the raw 2013 HCAADT of 3,410 becomes 2,795 after dividing by 1.22.

Consequently, adjusted HCAADT can be thought of as the corridor-specific traffic growth (or decrease) after "subtracting" overall state HCVMT change. When the adjusted annual HCAADT growth rate is positive, the corridor is experiencing faster growth than the state as a whole; when negative, the corridor's growth trails the statewide benchmark for that year. The adjusted annual HCAADT growth rate is very close[15] to the difference between raw HCAADT growth and HCVMT growth. For instance, adjusted HCAADT growth in 2013 of negative 2 percent is attributable to raw HCAADT growth at 1 percent being more than offset by the state HCVMT growth rate of 3 percent.

[15] The math is generally not exact due to the changing baselines used in the index adjustment step.

Figure 4: Chart for HCAADT Normalization Example



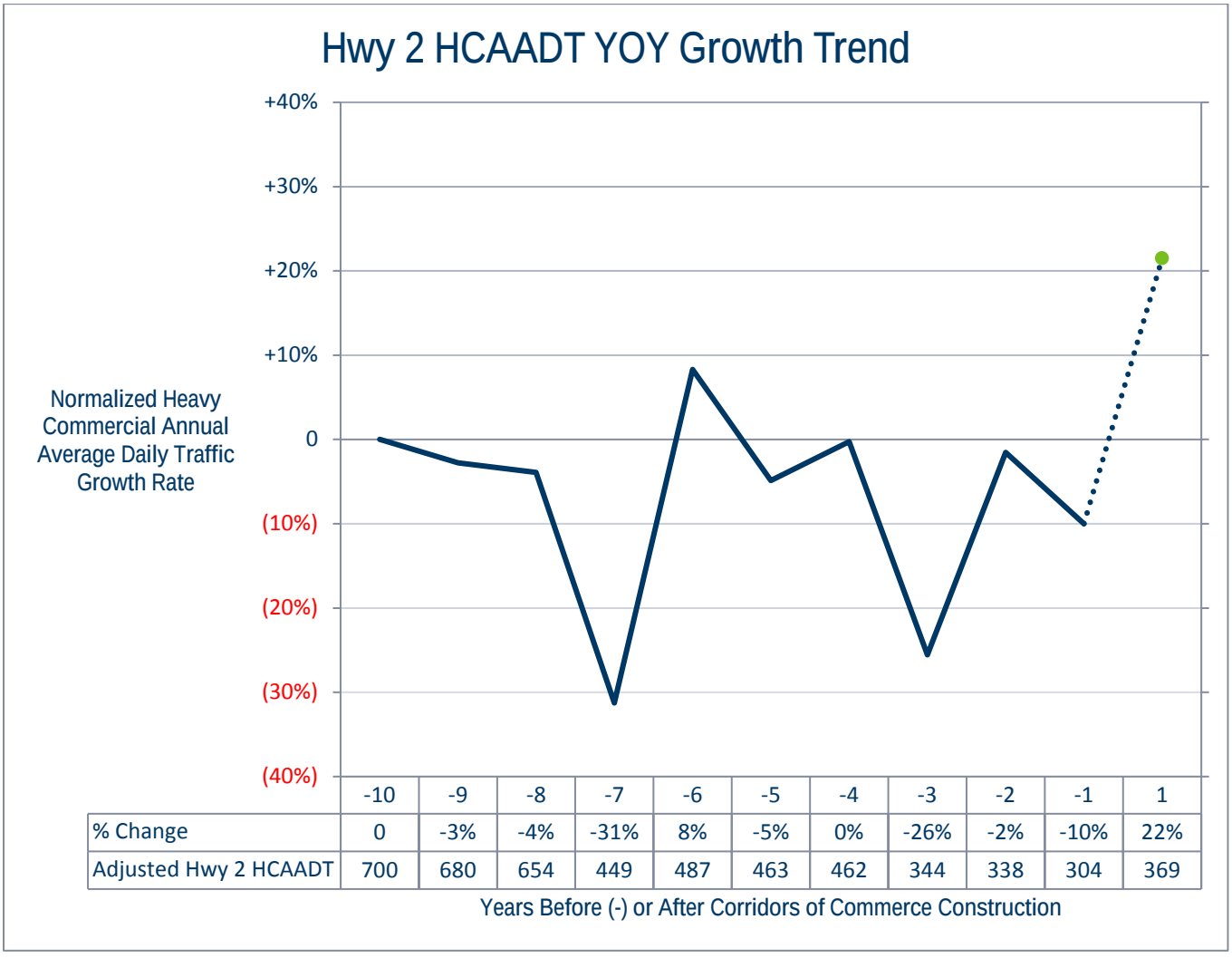
Charting the adjusted HCAADT growth rates is a useful way of summarizing traffic developments. In this example, the corridor registers growth in 2009 above the statewide reference level, but three years of declining relative performance follow in 2010 through 2012, as the corridor loses ground against the broader statewide trend. In 2013 the decline continues but at a slower rate. Following the two-year data gap during construction, in 2016 the corridor posts its first positive result since 2009, exceeding statewide HCVMT growth by 1 percent annualized. The dashed line signals the discontinuity in the annual series because of the construction gap. Although the investment is associated with encouraging ensuing growth, this better-than-average performance would need to be sustained for additional years just to catch up with the HCVMT track starting in 2008. Noting that the 2016 adjusted HCAADT of 2,895 lies below the 2008 baseline level of 3,000 leads to the conclusion that the deficit amassed in the down years collectively outweighs the progress made in 2009 and 2016.

Heavy Commercial Vehicle Traffic Growth Trends on Completed Projects

Replicating the traffic trend analysis with at least one year of post-construction data is only possible for the four Corridors of Commerce projects funded in the 2013 program and evaluated in the initial Corridors of Commerce report, considering that the first projects opened in 2015 while HCAADT collection and publication lags by two to three years. Currently, the most recent official HCAADT figures date from 2017. However, the post-construction evaluation requires at least two full years of volume data following project completion, since the effects are reported in the form of year-over-year rates of growth or decline. Requiring a second year of post-construction traffic volumes ensures that sharp increases in volumes between the final construction year (due to the effects of road closures, lane closures or detours) and the first post-construction year do not appear as part of the results

In the meantime, the 10-year historical trends, along with the change in the volumes between the first two post-construction years for each of the four initial Corridors of Commerce project locations can be inspected and are summarized in the figures below. For the time dimension along the x-axis, [-10] (10 years before Corridors of Commerce construction) corresponds to the observation year 2004, [-1] refers to the year 2013 and [1] refers to the year 2017. (The growth rate scale on the y-axis is recalibrated in each case to fit the data range, and each graph is vertically centered at 0 percent.)

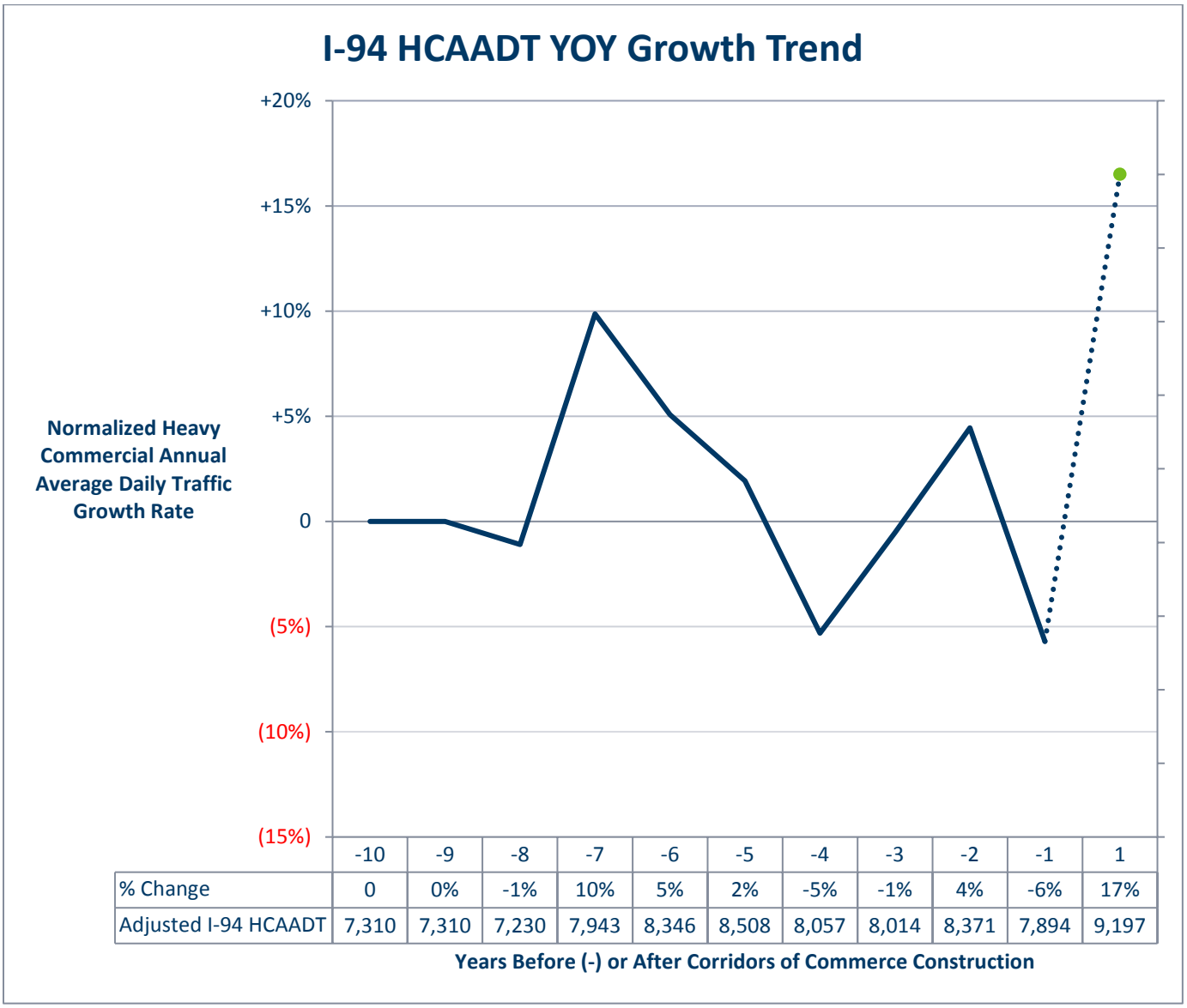
Figure 5: Highway 2 HCAADT Trend



	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	1
% Change	0	-3%	-4%	-31%	8%	-5%	0%	-26%	-2%	-10%	22%
Adjusted Hwy 2 HCAADT	700	680	654	449	487	463	462	344	338	304	369

The segments of Highway 2 that include the Corridors of Commerce passing lane improvements generated low heavy commercial traffic growth in the preceding 10 years (depicted in Figure 5), beating the state HCVMT comparison just once (six years before, in 2008) and tying the benchmark on one other occasion (in 2010). Particularly sharp declines occurred in 2007 and again in 2011. However, the corridor's decline in traffic volumes began to level off by the following year and has actually begun to show an increase from the last year before the start of construction to the beginning of the post-construction period. This rebound brought heavy commercial volumes in 2017 back to where they were between 2010 and 2011. From the beginning to the end of the period examined, adjusted HCAADT reduced by just less than 50 percent.

Figure 6: I-94 HCAADT Trend

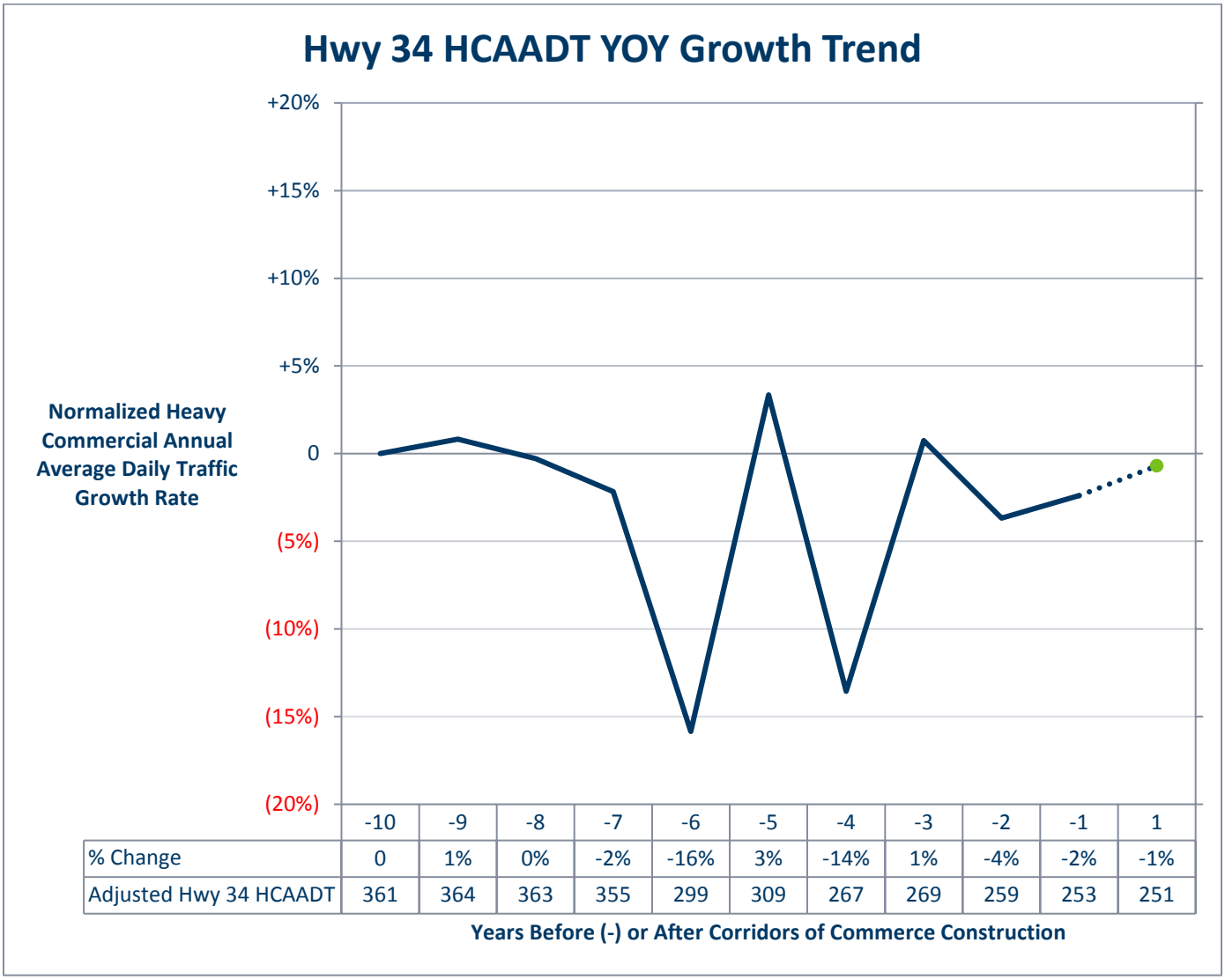


In the most recent 10-year period, the I-94 expansion segment between Rogers and St. Michael (shown in Figure 6) generally outpaced the statewide heavy commercial traffic rate of growth, only posting two years that were substantially below the statewide level (during 2010 and 2013). Recovery followed in subsequent years, pushing adjusted HCAADT up nearly 15 percent over the 2004 level by the beginning of the expansion project. Traffic levels

have continued to grow since completion of the project, with 2017 volumes approximately 26 percent higher than in 2004.

Interestingly, the picture for Highway 34 leading up to construction of its passing lane sections resembles that for the nearby and parallel passing lanes project site along Highway 2. As shown in Figure 7, each location featured two isolated years of sharp HCAADT reductions—although Highway 34's downturns were less severe—amid otherwise flat adjusted traffic. In the years immediately preceding and following construction, heavy commercial traffic volumes were relatively stable, with trends mirroring or only slightly lagging trends in statewide commercial traffic.

Figure 7: Highway 34 HCAADT Trend

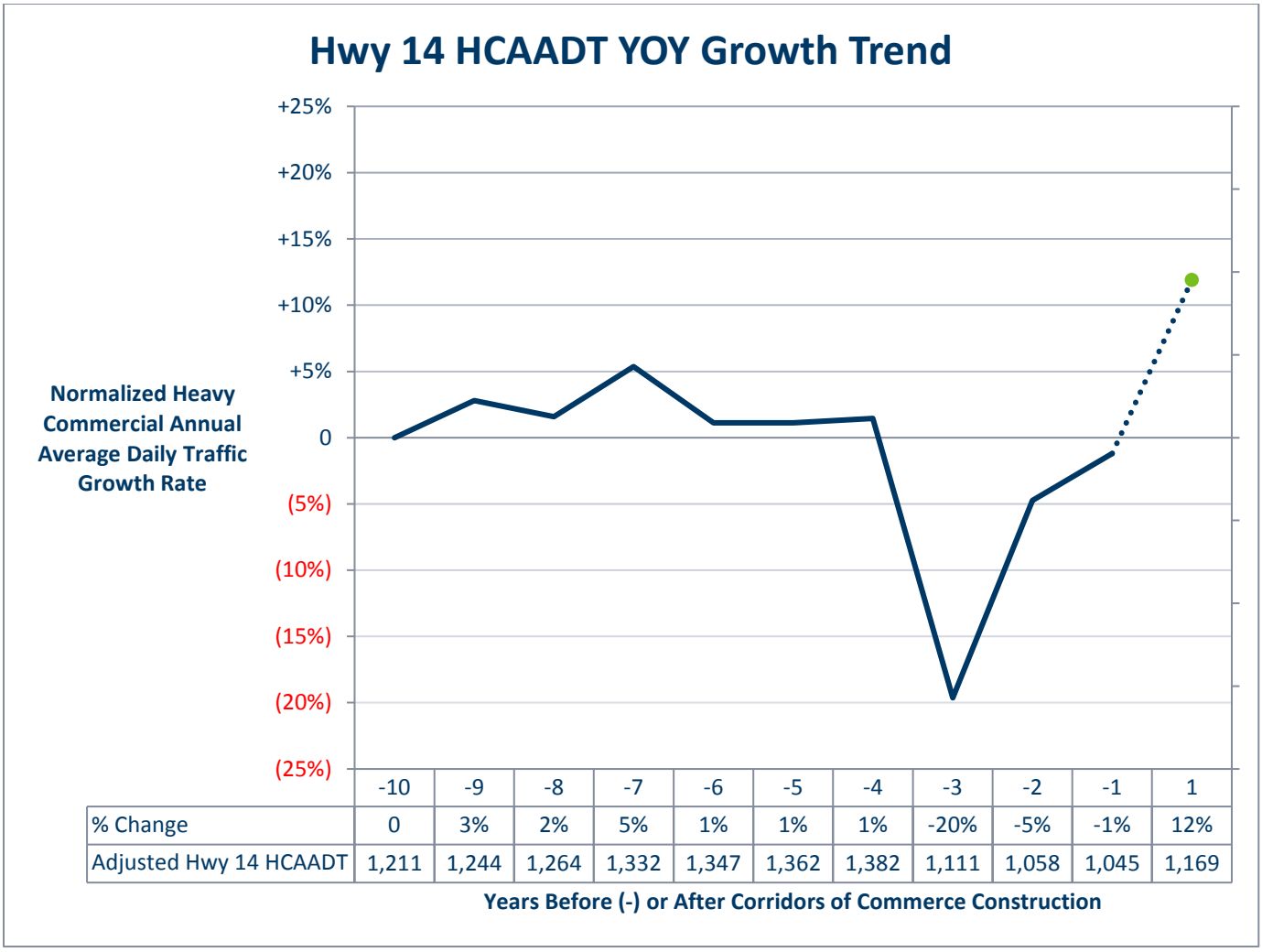


	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	1
% Change	0	1%	0%	-2%	-16%	3%	-14%	1%	-4%	-2%	-1%
Adjusted Hwy 34 HCAADT	361	364	363	355	299	309	267	269	259	253	251

Between 2005 and 2010, the segments of Highway 14 that surround the Corridors of Commerce expansion area (running just east of Owatonna) closely tracked with statewide growth in heavy commercial traffic, modestly exceeding that baseline by 1 percent to 5 percent each year (see Figure 8). This period of parity ended abruptly in 2011, three years before the widening, when adjusted truck volume fell 20 percent. This sharp decline appears to have been a single-year phenomenon, with heavy commercial traffic growth rates rebounding to near the statewide average in the year prior to construction. This section of Highway 14 has begun to see more substantial growth since

the completion of construction. Although only one year of growth was observed since the project's completion, the estimated volume growth is well above statewide trends. Overall heavy commercial volumes in 2017 were at their highest level since 2010.

Figure 8: Highway 14 ("Segment 1" of Owatonna to Dodge Center) HCAADT Trend



	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	1
% Change	0	3%	2%	5%	1%	1%	1%	-20%	-5%	-1%	12%
Adjusted Hwy 14 HCAADT	1,211	1,244	1,264	1,332	1,347	1,362	1,382	1,111	1,058	1,045	1,169

While there is limited evidence to date of the impact of construction on traffic volume growth for the earliest Corridors of Commerce projects, the few projects available suggest trends in heavy commercial traffic that are matching or exceeding statewide trends in commercial traffic. More evidence on the longer-term effects of these projects is needed to draw firmer conclusions. By the time of the next evaluation period (approximately mid-2020), these initial projects should have three years' worth of traffic volume trends following completion of construction to draw upon, and additional projects can begin to be observed in their post-construction phase.

Appendix C: 2017 Funding – Project Scoring Greater Minnesota

Greater Minnesota Projects: 2017 Corridors of Commerce Program

District	Highway	Description	Cost	Total Points
3	169	TH101 to 197th 01 Full freeway conversion	$174,110,000	600
3	I-94	St. Michael to Albertville - construct auxiliary lane	$62,420,000	580
3	169	TH101 to 197th 01 partial freeway conversion	$92,040,000	575
3	I-94	St. Michael to Albertville - construct 4 to 6 lane conversion	$77,800,000	570
3	I-94	St. Michael to Albertville - construct 4 to 6 lane conversion & Int. A	$77,800,000	570
6	14	Owatonna to Dodge Center construct 2 to 4 lane conversion	$160,410,000	525
3, 8	23	Willmar to St. Cloud - construct 2 to 4 lane conversion	$105,070,000	520
1	I-35	21st Ave to Garfield Avenue - TPP #2	$270,570,000	515
1	I-35	27th Ave to Garfield Avenue - TPP #1	$270,570,000	515
3	23	Paynesville to Richmond construct 2 to 4 lane conversion	$57,520,000	515
3	I-94	Albertville to Clearwater construct 4 to 6 lane conversion	$179,540,000	510
6	14	CR 16 to Dodge Center construct 2 to 4 lane conversion	$138,610,000	510
3	10	Wadena construct 2 to 4 lane conversion	$39,210,000	490
3	371	Jenkins to Pine River construct 2 to 4 lane conversion	$48,020,000	485
6	14	54th Ave to CR 3 construct 2 to 4 lane conversion	$100,060,000	485
6	14	CR 3 to Dodge Center construct 2 to 4 lane conversion	$85,850,000	485
7	14	New Ulm to Nicollet construct 2 to 4 lane conversion	$79,200,000	485
M, 8	212	Granite Falls to Chaska construct 2 to 4 lane conversion	$398,660,000	485
3	I-94	Monticello to Clearwater construct 4 to 6 lane conversion	$54,720,000	485
3	371	Jct of TH 210 construct interchange	$43,040,000	480
6	14	Jct CR 104 construct an interchange	$39,180,000	465
6	52	Jct TH 14 capacity improvements	$34,140,000	465
7	14	New Ulm to Courtland construct 2 to 4 lane conversion	$64,320,000	465
7	14	CR 37 to Nicollet Expansion	$67,550,000	460
2	11	Roseau to Warroad construct 2 to 4 lane conversion	$56,970,000	455
3	I-94	Monticello to Hasty construct 4 to 6 lane conversion	$86,120,000	455
1	169	Pengilly to Bovey construct 2 to 4 lane conversion.	$75,530,000	450
1	169	CSAH 7 to TH 65 construct 2-to 4 lane conversion	$75,530,000	445
6	14	56th Ave to CR 16 construct 2 to 4 lane conversion	$28,900,000	445
6	14	Construct Byron Interchange Option 1	$17,190,000	445
6	14	Construct Byron Interchange Opt2	$16,500,000	445
6	14	Construct Byron Interchange Option 3	$24,780,000	445
7	14	New Ulm to W. Courland Expansion	$36,840,000	445
3	210	Pillager to Ironton construct 2 to 4 lane conversion	$98,480,000	440
7	14	Nicollet to W. Courtland construct 2 to 4 lane conversion	$54,090,000	440
3	I-94	Construct improved interchange at TH 23	$2,500,000	435
6	52	Jct TH 57 construct interchange	$10,590,000	430

District	Highway	Description	Cost	Total Points
3	10	Royalton interchange construction	$35,280,000	425
3	210	Motley to Baxter construct 2 to 4 lane conversion	$86,250,000	425
8	23	New London to Paynesville construct 2 to 4 lane conversion	$47,550,000	425
7	14	Nicollet to E. Courtland Expansion	$19,060,000	410
1	169	CSAH 7 to CSAH 80 construct 2 to 4 lane conversion.	$28,150,000	400
8	23	Jct TH 19 construct interchange	$13,350,000	390
7	60	Construct interchanges through Windom	$58,070,000	385
1	61	Construct a roundabout at 40th Ave	$14,990,000	375
7	14	Jct TH 14 construct new interchange	$94,920,000	375
8	23	Pipestone to Willmar construct passing lanes	$8,320,000	370
8	23	Jct. TH 59 construct interchange	$15,090,000	370
7	169	Construct bypass of St. Peter	$224,590,000	365
1	169	CSAH 83 to TH 65 construct 2 to 4 lane conversion	$18,530,000	360
1	I-35	Jct CSAH 3 construct interchange	$4,610,000	360
3	23	Downtown St. Cloud - Freeway Conversion	$45,350,000	360
1	2	Jct CSAH 13 construct roundabout.	$1,640,000	355
1	61	Jct. 40th Ave construct roundabout	$3,230,000	355
3	10	Jct CSAH 11 safety improvement	$2,380,000	350
8	212	Granite Falls to Montevideo construct passing lane	$3,980,000	350
1	61	40th Ave intersection improvements	$2,230,000	340
2	11	Roseau to Warroad passing lane and realignment near airport	$8,510,000	340
4	I-94	Construct new interchange	$19,690,000	340
8	212	Granite Falls to Montevideo reconstruction	$6,980,000	340
7	169	Construct Lind St. and Webster St. interchanges	$50,160,000	335
1	61	Jct Homestead Rd construct J-turn	$630,000	330
1	2	Grand Rapids to TH 63 - 4 to 5 lane conversion.	$2,880,000	325
1	53	Jct. CSAH 16 construct J-turn	$610,000	325
2	59	CSAH 3 to Thief Rivers Falls construct 2 to 4 lane conversion	$16,890,000	325
8	23	Willmar to Priam construct 2 to 4 lane conversion	$7,650,000	325
1	210	TH 169 to TH 65 reconstruction	$12,040,000	320
4	59	Detroit Lakes to Mahnomen construct passing lane	$3,766,000	320
8	23	Jct. CSAH 1 construct left turn lane	$730,000	320
1	53	Jct TH 1 construct J-turn	$670,000	315
1	169	Jct TH 25 construct J-turn	$580,000	310
1	2	Jct TH 194 construct roundabout	$2,830,000	310
2	11	Roseau to Warroad construct passing lanes	$3,793,000	310
8	23	TH 71 to CR 5 construct 2 to 4 lane conversion	$4,790,000	310
1	53	Jct Solway Rd. J-turn	$560,000	305
1	53	Jct. CSAH 9 construct J-turn	$620,000	300
8	23	Pipestone to Russell surfacing project	$44,760,000	300
1	169	Jct CSAH 137 construct J-turn	$860,000	295
8	212	Brownton to Stewart construct passing lane	$3,500,000	295

District	Highway	Description	Cost	Total Points
8	71	Construct Redwood Falls bypass	$12,020,000	295
1	61	Jct. McQuade Rd construct J-turn	$980,000	290
8	212	Buffalo Lake to Steward construct passing lane	$3,230,000	290
1	53	Jct. CSAH 15 construct J-turn	$475,000	285
1	169	CSAH 7 to TH 65 safety improvements	$5,490,000	280
1	33	Jct CSAH 7 construct J-turn	$510,000	280
8	23	Jct TH 7 construct interchange	$6,600,000	280
8	212	Sacred Heart to Renville passing lane	$2,750,000	275
8	212	Jct TH 15 construct roundabout	$2,443,000	270
1	53	Virginia to Intl Falls install passing lanes	$2,900,000	260
8	23	Jct. TH 7 construct roundabout	$3,120,000	260
1	169	Safety Improvements	$5,490,000	255
1	61	Jct Ryan Rd construct J-turn	$1,640,000	250
8	212	Replace BNSF bridge in Granite Falls	$9,790,000	235
8	23	New London to Paynesville construct passing lane	$9,030,000	210
8	23	New London to Paynesville construct Super 2	$8,510,000	175

Note: MnDOT Office of Transportation System Management - April 30, 2018

Appendix D: 2017 Funding – Project Scoring Metro

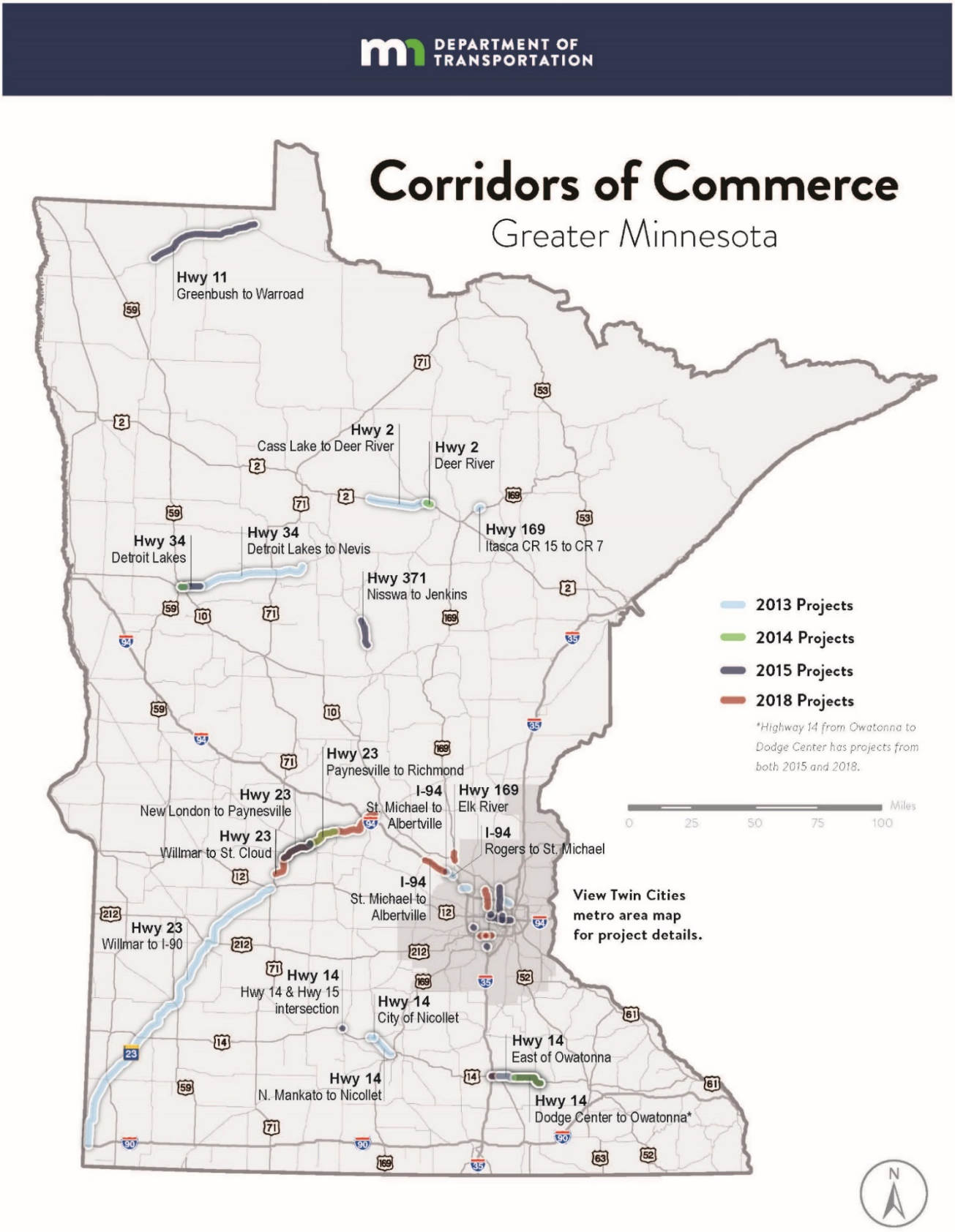
Metro Projects: 2017 Corridors of Commerce Program

District	Highway	Description	Cost	Total Points
Metro	I-494	France Ave to TH 77 construct MnPASS lane	$149,020,000	660
Metro	I-494	Bush Lake Rd to 35W construct a turbine interchange	$92,170,000	655
Metro	252 / I-94	Convert to a freeway and add MnPASS lanes Dowling to TH 610.	$163,220,000	645
Metro	I-494	France Ave to I-35W construct improvements	$91,700,000	640
Metro	I-494	TH 100 to I-35W construct an EB auxiliary lane	$12,470,000	625
Metro	169	CSAH 17 to I 494 construct MnPASS	$152,490,000	620
Metro	I-494	Bush Lake Rd to TH 100 construct turbine interchange	$79,360,000	615
Metro	65	TH 10 to 117th Ave freeway design	$99,070,000	615
Metro	I-494	Bush Lake Rd to TH 100 interchange improvements	$13,480,000	610
Metro	I-494	France Ave to I-35W construct auxiliary lane	$12,010,000	605
Metro	I-94	Jct. with TH 280/Franklin Avenue interchange improvements	$89,420,000	605
Metro	36	I-35W to I-35E construct MnPASS	$61,130,000	600
Metro	169	CR 21 to I 494 construct MnPASS	$39,070,000	595
Metro	10 / 169	TH 169 to Thurston Ave freeway conversion	$55,180,000	590
Metro	77	Apple Valley to Bloomington add MnPASS	$37,110,000	580
Metro	252	Convert to a freeway and extend 3rd lane	$95,670,000	575
Metro	13	Jct Dakota Ave construct interchange	$25,650,000	570
Metro	I-35W	Construct NB flyover to WB I-494	$79,890,000	570
Metro	65	105th Ave to 117th construct freeway design	$57,120,000	565
Metro	65	Jct 109th Ave construct interchange	$26,360,000	565
Metro	94/494/694	Construct a SB I-694 to EB I-94 flyover ramp	$26,890,000	565
Metro	62	I-35W to TH77 construct EB auxiliary lane	$22,560,000	560
Metro	I-35W	Construct a SB I-35W to EB I-694 flyover	$22,470,000	555
Metro	65	Jct TH 10 construct free flow improvements	$42,880,000	550
Metro	I-94	Maple Grove to Rogers add lanes in both direction	$8,250,000	550
Metro	36	Jct Century construct interchange	$32,170,000	545
Metro	I-494	Bush Lake Rd to TH 100 construct auxiliary lane	$1,500,000	545
Metro	61	Jct Warner Rd construct interchange	$33,020,000	545
Metro	169	Jct TH 282 construct interchange	$13,300,000	540
Metro	212	NYA to Chaska construct 2 to 4 lane conversion	$97,980,000	535
Metro	62	I-35W to TH 77 construct auxiliary lane both directions.	$15,230,000	530
Metro	62	Tracy to TH 35W expand roadway 2-lanes to 4-lanes	$154,050,000	530
Metro	I-94	Construct TH 610 gap	$37,230,000	525
Metro	212	Dahlgren to Carve construct 2 to 4 lane conversion	$45,250,000	520
Metro	I-35W	Construct a NB I-35W to WB I-694 flyover	$24,660,000	520
Metro	I-494	TH 100 to TH 77 construct 2 additional lanes	$140,820,000	520
Metro	62	Penn Ave to TH 169 add additional lanes in each direction	$51,670,000	520
Metro	212	Cologne to Carver construct 2 to 4 lane conversion	$45,250,000	515

District	Highway	Description	Cost	Total Points
Metro	I-494	TH 100 to TH 77 construct 2 additional lanes & I-35W interchange	$220,810,000	515
Metro	I-94	Fish Lake to Maple Grove construct auxiliary lane both directions	$12,680,000	515
Metro	13	Quentin Ave to Washburn Ave add a new interchange	$33,720,000	510
Metro	62	TH 77 to Portland Ave H Ave add auxiliary lane in each direction	$19,650,000	510
Metro	77	NB TH 77 to WB TH 62 construct flyover ramp	$36,550,000	510
Metro	97	I-35 to TH61 expand 2-lanes to 4-lanes	$16,130,000	510
Metro	65	Jct 117th Ave construct interchange	$16,110,000	505
Metro	55	Expand the roadway from two lanes to four lanes.	$38,920,000	500
Metro	8	Expand the roadway from two lanes to four lanes.	$58,520,000	495
Metro	94/494/694	Construct two flyover ramps	$101,870,000	495
Metro	I-94	I-94/494/694 interchange reconstruction	$96,790,000	490
Metro	36	Jct. Manning Ave construct interchange	$21,170,000	485
Metro	212	NYA to Benton construct 2 to 4 lane conversion	$53,730,000	480
Metro	212	NYA to Cologne construct 2 to 4 lane conversion	$53,730,000	480
Metro	36	N. St. Paul to St. Croix River freeway conversion	$140,170,000	480
Metro	I-94	TH 52 to Jackson St construct WB buffer lane	$2,510,000	475
Metro	36	I-35W to I-35E construct EB auxiliary lane	$26,830,000	470
Metro	494 / 694	Expand Tamarack Rd to Co Rd 10 to 6-lanes	$10,300,000	470
Metro	I-94	Jct. with TH 252 interchange ramp improvement	$1,960,000	470
Metro	61	Jct Afton Rd construct interchange	$12,610,000	460
Metro	36	I-35 W to I-35 E construct 4 to 6 lane conversion	$93,560,000	450
Metro	I-94	I-35E to 5th St construct a WB lane addition	$8,500,000	450
Metro	252	Extend 3rd lane	$17,690,000	445
Metro	I-35W	Construct an I-694 exit only lane	$1,950,000	440
Metro	41	Chaska to CSAH 61 improvements	$9,180,000	435
Metro	101	Construct interchange from Diamond Lake Rd to I-94	$28,710,000	425
Metro	55	Lake St interchange reconstruction	$3,650,000	425
Metro	110	Mendota to Inver Grove freeway conversion	$121,780,000	420
Metro	62	Jct TH 77 construct ramps	$1,300,000	415
Metro	101	Construct SB flyover access to I-94	$41,220,000	405
Metro	36	Construct new interchange at Lake Elmo	$31,190,000	395
Metro	10	Other: Make Hwy 10 in Blaine at least three lanes in each direction	$1,400,000	390
Metro	I-35E	Add lanes from I-35E/I35W split to TH 97	$3,740,000	390
Metro	61	Jct TH 10 construct interchange	$25,020,000	390
Metro	101	Expand the roadway to 4-lane CSAH 14 to CSAH 61	$32,150,000	385
Metro	I-35W	CR C to CR D exit lane	$1,940,000	380
Metro	5	Victoria to Chanhassen construct 2 to 4 lane conversion	$21,540,000	365
Metro	61	Jct TH 95 construct interchange	$23,290,000	365
Metro	61	Jct Warner Rd left turn lane improvement	$590,000	355
Metro	156	Barge Channel Rd. Project	$27,630,000	335

Note: MnDOT Office of Transportation System Management - April 30, 2018

Appendix E: Maps


DEPARTMENT OF TRANSPORTATION
Corridors of Commerce
Greater Minnesota
Hwy 11
Greenbush to Warroad
Hwy 2
Cass Lake to Deer River
Hwy 2
Deer River
Hwy 34
Detroit Lakes
Hwy 34
Detroit Lakes to Nevis
Hwy 169
Itasca CR 15 to CR 7
Hwy 371
Nisswa to Jenkins
Hwy 23
Paynesville to Richmond
Hwy 23
New London to Paynesville
I-94
St. Michael to Albertville
Hwy 169
Elk River
Hwy 23
Willmar to St. Cloud
I-94
Rogers to St. Michael
I-94
St. Michael to Albertville
Hwy 23
Willmar to I-90
Hwy 14
Hwy 14 & Hwy 15 intersection
Hwy 14
City of Nicollet
Hwy 14
East of Owatonna
Hwy 14
N. Mankato to Nicollet
Hwy 14
Dodge Center to Owatonna*
2013 Projects
2014 Projects
2015 Projects
2018 Projects
*Highway 14 from Owatonna to Dodge Center has projects from both 2015 and 2018.
Miles
0
25
50
75
100
View Twin Cities metro area map for project details.
N

DEPARTMENT OF TRANSPORTATION

Corridors of Commerce

Twin Cities Metro Area