APPENDIX 5: **FINANCIAL ANALYSIS**

Appendix 5. Financial Analysis

Background

The outputs of the finanacial analysis were highlighted in the Plan in order to describe the general state of public transit finances. However, the precise methodology that was utilized to calculate these values was not included. This appendix is intended to serve as documentation of those assumptions, efforts, and conclusions that led to the creation of the financial components in the Plan.

For this effort, the Transit Needs Survey conducted in March 2019 provided input from the State's 35 public transit agencies on the additional personnel, vehicles, and facilities needed to provide their desired level of service for the short-range horizon of 2030 and the long-range horizon of 2050. It is important to forecast what the costs to meet these needs may be and what amount of revenue is likely to be available. This appendix and Chapter 4 in the Plan address that by forecasting costs based on historical operating costs along with anticipated staff, facility, and vehicle needs, and forecasting revenues based on historical funding levels. The most critical piece of information presented in this appendix is the shortfall between anticipated future costs and revenues.

Methodology

Shortly after the Transit Needs Survey concluded in March 2019, initial planning began on a concept (Figure A5.1) to estimate the costs of accomplishing some of the stated goals of the plan, particularly being able to afford operating the transit services and maintaining or expanding capital assets such as facilities and vehicle fleets. The financial analysis consisted of several subcomponents. The first component needed was to establish a trend or baseline up to the present, reflected as historical costs and revenues. This data was fairly straightforward to acquire as it has been aggregated and reported to Iowa DOT by the transit agencies for the last few decades.
In addition to establishing a baseline for revenue and costs, the analysis also needed to be able to include anticipated or projected costs and revenue going forward into the future to the year 2050. These two components proved to be much more labor intensive as they required the validation of assumptions such as average costs per square foot for different types of facilities, as well as indexing to reflect the higher future costs due to inflation over time.

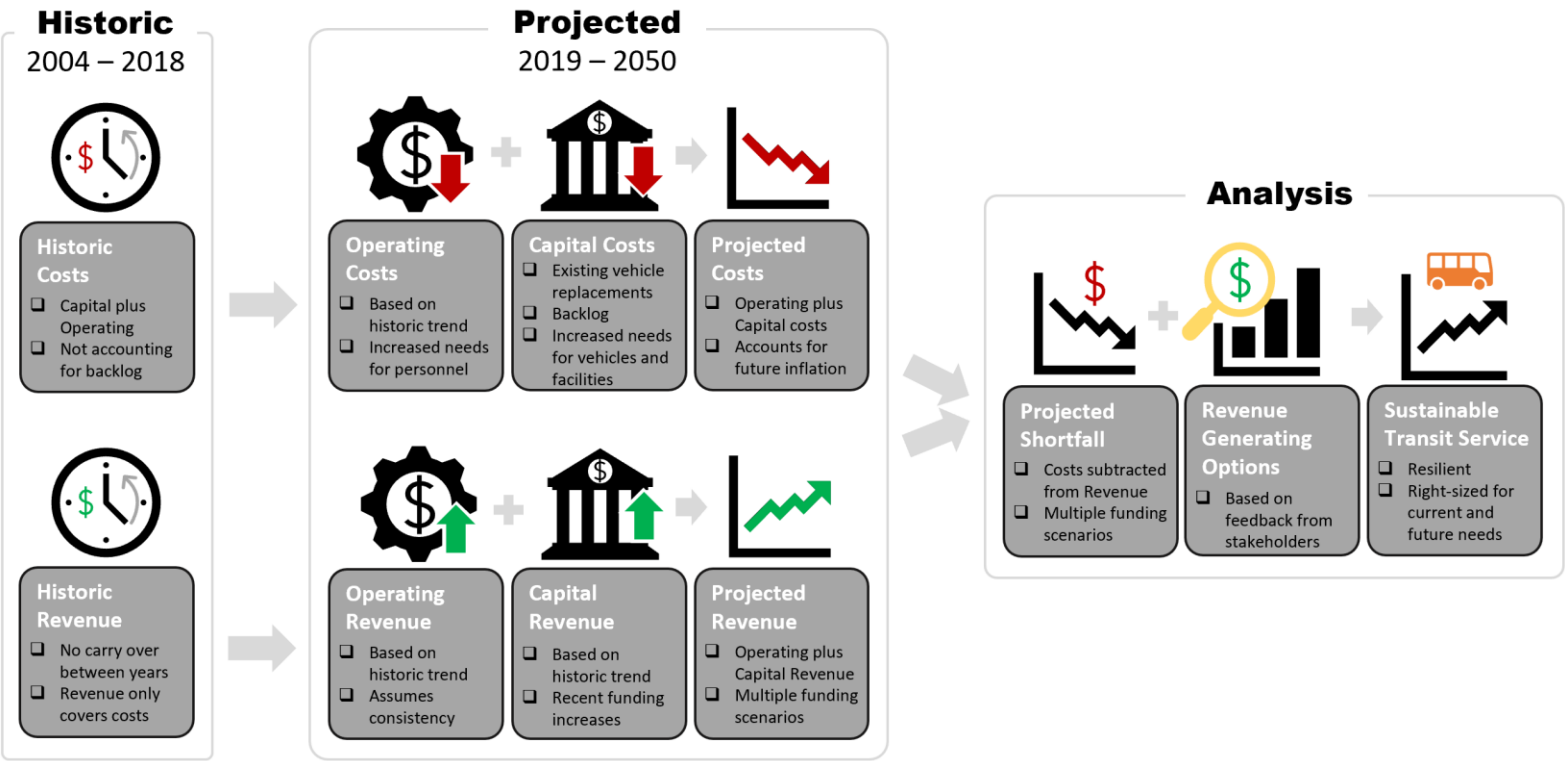
Lastly, the final component included a projection of the anticipated shortfall which was the net result after subtracting projected costs from the projected revenues. This shortfall will then become the focal point for which alternative or complementary funding mechanisms

could be adopted in order to mitigate, reduce, or eliminate any gap between cost and revenue, helping to ensure that the goals and strategies of this plan could be accomplished within the planning horizon of 2050.

Primary components of the transit financial analysis include:

- **Historical Costs and Revenues:** Capital and operating expenditures by year from 2004 to 2018
- **Projected Revenue:** Operating and capital revenue by funding scenario by year from 2019 to 2050
- **Projected Costs:** Operating and capital expenses by year from 2019 to 2050
- **Projected Shortfall:** Net difference between projected costs and revenue by funding scenario by year from 2019 to 2050

Figure A5.1: Financial analysis concept



Source: Iowa DOT

Historical Costs and Revenues

The financial analysis for this Public Transit Plan leveraged the revenue-cost forecasting approach used in previous modal and state transportation system analyses. The data gathered for Iowa in Motion 2045 served as the basis for understanding transit-related expenditures up to 2016 with only the data for years 2017 and 2018 needing to be populated for this Plan.

While the 5-Year Program served as the framework for presenting financial information in the Iowa in Motion 2045 plan, it was only included for context in the Public Transit plan. Another component, total operating costs, served as a key planning factor for estimating future operation costs which typically fluctuate depending on contemporary fuel prices, employee wages, and vehicle maintenance.

The components of the historical costs include the following. Figure A5.2 provides the historical costs from 2004 to 2018.

5-Year Program

- **Transit portion of 5-Year Program:** State Transit Assistance plus the Public Transit Infrastructure Grant Program.
- **Percent 5-Year Program:** Percentage of the value of the 5-Year Program that reflects transit projects and programs.

Total Capital

- **5309/5339 capital:** Capital projects for replacement, rehabilitation, and purchase of vehicles. Includes urban, non-urban, and metropolitan areas in Iowa. Includes federal Congestion Mitigation and Air Quality (CMAQ) monies that are taken off the top of Iowa's CMAQ apportionment by the Iowa Transportation Commission for bus replacement.
- **PTIG capital:** Public Transit Infrastructure Grant (PTIG) funding, which was established by the 2006 Iowa General Assembly. The purpose is to provide funding for improvement of the vertical infrastructure of Iowa's designated public transit systems. Funding amounts vary by fiscal year.

Total Operating

- **Federal Transit Assistance (FTA):** Formula allocation and competitive federal funding for metropolitan and non-metropolitan transportation planning, grant programs, senior and individuals with disabilities mobility programs, intercity bus assistance, and bus facilities grants.
- **State Transit Assistance (STA):** Primarily formula allocation and competitive State funding for transit assistance, fellowship programs, special projects, infrastructure grants, and capital match loan programs.
- **Local:** The bulk of transit funding in Iowa comes from local sources, especially on the operating side, typically generated from passenger revenues such as farebox revenue and ticket prices, and contract revenue by provide certain types of rides to

organizations and private businesses. Other sources of local funding can also derive from municipal or regional transit levies, student fees, or advertising revenue.[1]

Figure A5.2: Historical transit costs, 2004 – 2018

HISTORICAL COSTS	2004	2005	2006	2007	2008	2009	2010
Transit portion of 5 Yr Program	$8,123,000	$10,992,000	$10,780,000	$12,561,000	$12,457,000	$13,303,000	$12,341,000
Percent 5 Yr Program	$98,659	$128,922	$118,552	$137,931	$114,776	$118,739	$115,312
5309/5339 capital	$11,262,135	$10,389,561	$8,798,961	$4,171,920	$10,784,880	$9,208,690	$6,252,600
PTIG capital	$1,970,000	$1,970,000	$1,970,000	$2,200,000	$2,200,000	$2,200,000	$1,250,000
Total capital	$13,232,135	$12,359,561	$10,768,961	$6,371,920	$12,984,880	$11,408,690	$7,502,600
Total operating	$69,101,622	$72,901,317	$80,161,753	$84,695,200	$95,548,592	$100,626,759	$99,520,261
Total operating & capital	**$82,333,757**	**$85,260,878**	**$90,930,714**	**$91,067,120**	**$108,533,472**	**$112,035,449**	**$107,022,861**

HISTORICAL COSTS	2011	2012	2013	2014	2015	2016	2017	2018
Transit portion of 5 Yr Program	$12,239,000	$12,238,656	$11,738,656	$13,023,032	$13,654,125	$15,451,000	$0	$0
Percent 5 Yr Program	$113,380	$96,072	$97,344	$103,267	$105,269	$115,847	$0	$0
5309/5339 capital	$0	$15,101,560	$5,109,640	$7,079,828	$7,266,453	$7,252,086	$7,585,401	$10,334,991
PTIG capital	$2,000,000	$2,000,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000
Total capital	$2,000,000	$17,101,560	$6,609,640	$8,579,828	$8,766,453	$8,752,086	$9,085,401	$11,834,991
Total operating	$105,947,101	$110,289,501	$113,980,336	$117,530,563	$120,939,956	$124,621,775	$130,300,140	$134,969,649
Total operating & capital	**$107,947,101**	**$127,391,061**	**$120,589,976**	**$126,110,391**	**$129,706,409**	**$133,373,861**	**$139,385,541**	**$146,556,245**

Note: 5-Year Program data was not available for 2017 and 2018

Source: Iowa DOT

Projected Revenue

When forecasting or projecting the amount of revenue and funds for public transportation, an important consideration is that unlike private enterprises, public organizations do not typically generate a profit. Therefore, funding is either awarded or allocated based on anticipated needs or requests or applications for specific projects such as for capital assets; expected revenues are incorporated into a budget that the agency then operates out of to cover things such as salaries and fuel. Due to the variability of operational expenses, those tend to be the most difficult to project and as a result trends are utilized for that aspect of the forecast. Expected replacement costs and construction needs are based on physical capital assets that can be easier to anticipate which helps aid in those estimates.

[1] Iowa Department of Transportation, "Transit Manager's Handbook", 2020, https://iowadot.gov/transit/handbook/TMHandbookBinder.pdf

Regardless of the types and sources of revenue, it is important to project the availability of these resources into the future so that then can be used to compare and contrast against expected needs and expenses in order to determine any gaps or shortfalls in the funding.

Types of revenue include:

Operating Funding

- **Federal:** Formula allocation and competitive federal funding for metropolitan and non-metropolitan transportation planning, grant programs, senior and individuals with disabilities mobility programs, intercity bus assistance, and bus facilities grants.
- **State:** Primarily formula allocation and competitive State funding for transit assistance, fellowship programs, special projects, infrastructure grants, and capital match loan programs.
- **Local:** The bulk of transit funding in Iowa comes from local sources, especially on the operating side, typically generated from passenger revenues such as farebox revenue and ticket prices, and contract revenue by provide certain types of rides to organizations and private businesses. Other sources of local funding can also derive from municipal or regional transit levies, student fees, or advertising revenue.

Capital Funding

- **Scenario 1. Typical funding trend:** Capital funding trend in which recent increases (since 2018) to 5339 funds and federal competitive funds are not included. This trend reflects a conservative estimate of future funding in which recent increases to 5339 funds will not continue into the future and awarding of competitive grants will not be assumed.
  - **5339 Bus and Bus facilities (formula only):** Bus and Bus Facilities Grants program (section 5339) classified as a formula-based Federal transit assistance grant program. These funds can be utilized to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities. For Scenario 1, assumes that this funding is represented by trends since before 2018.
  - **CMAQ:** The Congestion Mitigation and Air Quality (CMAQ) Program is a Federal Highway Administration (FHWA) program that is intended to fund transportation or transit projects to assist non-attainment areas for Clean Air Act standards. Since Iowa has no areas that are considered non-attainment, Iowa receives the minimum allocation of these funds that can be utilized anywhere in the state for projects with the potential to reduce transportation-related congestion and air pollution.
- **Scenario 2. Increased funding trend:** This funding trend includes the available programs, grants, and funding sources described in Scenario 1, but also includes recent increases (since 2018) to 5339 capital funds. Scenario 2 also includes sources that are not guaranteed to be funded such as federal competitive grants. This trend reflects an optimistic estimate of future funding in which recent increases to 5339 funds continue indefinitely and competitive grants continue to be allocated to Iowa.

- **5339 Bus and Bus facilities (formula only):** Same type of program as described above, but when used in Scenario 2 it also assumes that recent increases since 2018 represent the new long-term trend for its funding level.
- **Discretionary Competitive Funding:** In addition to the formula-based program, 5339 funds also can be awarded through a discretionary competitive funding process. Due to the nature of competitive funding, it is not a guaranteed source of funds.
- **CMAQ:** Same definition as above.
- **PTIG:** Public Transit Infrastructure Grant (PTIG) funding, which was established by the 2006 Iowa General Assembly. The purpose is to provide funding for improvement of the vertical infrastructure of Iowa's designated public transit systems. Funding amounts vary by fiscal year.

Operating Funding

In order to project future funding to be utilized to cover operating costs, it was necessary to determine what the average annual change in operating expenses is expected to be. To determine this, the reported federal and state funding amounts each transit agency needed to cover these expenses were aggregated. However, federal and state funding for transit operating expenses represents only a fraction of these total costs. Local funding makes up the greatest percentage of these revenues and is typically made up of fare box revenue collected through bus tickets and boarding passes as well as any local partner contributions from cities and counties, contracted revenue, performing transit services for businesses, or advertising revenue. While local funding makes up the largest share of transit operating revenue, it is not normally directly reported to Iowa DOT and as such certain assumptions needed to be made in order to approximate it. What was known is total operating expenses as well as known federal and state funding sources. For the purposes of this financial analysis, it was assumed that the difference between reported operating costs and the sum of federal and state funding could be used to represent local funding.

Figure A5.3 shows the percentage breakdown of federal, state, and assumed local funding that was utilized to cover operational expenses by transit agencies from 2004 to 2018. Starting with 2005, the percentage change from the previous year was calculated; these percentages were averaged over the course of the entire historical period, resulting in an average increase of 4.95 percent in operating costs per year.

Figure A5.3: Operating revenue by funding source from 2004 through 2018

	1	2	3	4	5	6	7	8
Funding Source	2004	2005	2006	2007	2008	2009	2010	2011
Federal	20.87%	20.26%	20.32%	23.26%	25.98%	25.43%	27.42%	25.80%
State	11.63%	13.63%	13.13%	12.43%	11.68%	10.43%	9.55%	9.93%
Local	67.50%	66.11%	66.56%	64.30%	62.34%	64.14%	63.03%	64.27%
Δ operating costs/previous year		5.50%	9.96%	5.66%	12.81%	5.31%	-1.10%	6.46%

Notes:
Difference between total historic costs and Federal + State is assumed to be covered by local sources

	9	10	11	12	13	14	15
Funding Source	2012	2013	2014	2015	2016	2017	2018
Federal	24.10%	24.76%	26.49%	24.74%	24.11%	22.62%	21.75%
State	10.23%	10.62%	10.62%	10.94%	11.11%	10.89%	10.54%
Local	65.66%	64.62%	62.89%	64.32%	64.78%	66.49%	67.71%
Δ operating costs/previous year	4.10%	3.35%	3.11%	2.90%	3.04%	4.56%	3.58%

Notes:
Difference between total historic costs and Federal + State is assumed to be covered by local sources

Average Funding (per year)	
23.86%	Federal
11.16%	State
64.98%	Local
4.95%	Δ change

Source: Iowa DOT

The federal, state, and local average annual increases were calculated and applied to the historical operation values in order to forecast total future operating revenue. As noted, operational revenue amounts equal the total operation expenditures. The results of this calculation are shown in Figure A5.4 in tabular format and as a stacked line chart in Figure A5.5. Just as with historical operating revenues, it is expected that local funding sources will make up the largest share of this which accounts for roughly 65 percent of funds. Federal funding comes in next at almost 24 percent with state funding at 11 percent.

Figure A5.4: Total forecasted operating revenue by funding source from 2019 through 2050

Transit operating funding forecast by year (2019 - 2030)

	1	2	3	4	5	6	7	8	9	10	11	12
Funding Source	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Federal	$33,798,677	$35,392,802	$36,986,927	$38,581,052	$40,175,178	$41,769,303	$43,363,428	$44,957,554	$46,551,679	$48,145,804	$49,739,929	$51,334,055
State	$15,804,945	$16,550,390	$17,295,836	$18,041,281	$18,786,726	$19,532,171	$20,277,616	$21,023,062	$21,768,507	$22,513,952	$23,259,397	$24,004,843
Local	$92,047,025	$96,388,452	$100,729,879	$105,071,306	$109,412,733	$113,754,160	$118,095,588	$122,437,015	$126,778,442	$131,119,869	$135,461,296	$139,802,723
Total	**$141,650,647**	**$148,331,644**	**$155,012,642**	**$161,693,640**	**$168,374,637**	**$175,055,635**	**$181,736,632**	**$188,417,630**	**$195,098,628**	**$201,779,625**	**$208,460,623**	**$215,141,621**

Notes:
Operating increases applied as simple interest (non-compounded); Principal*(1+(Rate*Year))

Transit operating funding forecast by year (2031 - 2040)

	13	14	15	16	17	18	19	20	21	22
Funding Source	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Federal	$52,928,180	$54,522,305	$56,116,431	$57,710,556	$59,304,681	$60,898,807	$62,492,932	$64,087,057	$65,681,182	$67,275,308
State	$24,750,288	$25,495,733	$26,241,178	$26,986,624	$27,732,069	$28,477,514	$29,222,959	$29,968,405	$30,713,850	$31,459,295
Local	$144,144,150	$148,485,577	$152,827,004	$157,168,431	$161,509,859	$165,851,286	$170,192,713	$174,534,140	$178,875,567	$183,216,994
Total	**$221,822,618**	**$228,503,616**	**$235,184,613**	**$241,865,611**	**$248,546,609**	**$255,227,606**	**$261,908,604**	**$268,589,602**	**$275,270,599**	**$281,951,597**

Notes:
Operating increases applied as simple interest (non-compounded); Principal*(1+(Rate*Year))

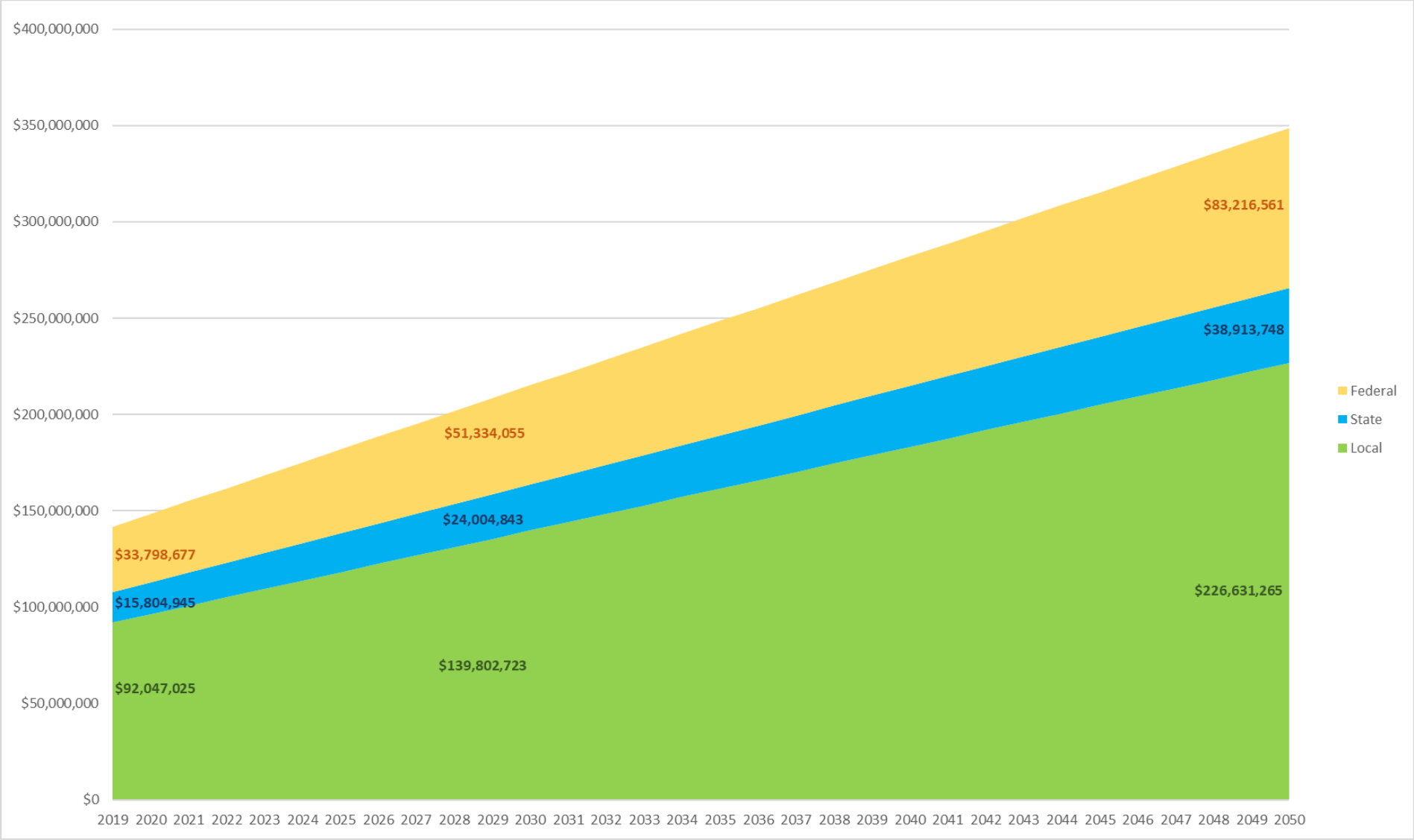
Transit operating funding forecast by year (2041 - 2050)

	23	24	25	26	27	28	29	30	31	32
Funding Source	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Federal	$68,869,433	$70,463,558	$72,057,684	$73,651,809	$75,245,934	$76,840,059	$78,434,185	$80,028,310	$81,622,435	$83,216,561
State	$32,204,740	$32,950,186	$33,695,631	$34,441,076	$35,186,521	$35,931,967	$36,677,412	$37,422,857	$38,168,302	$38,913,748
Local	$187,558,421	$191,899,848	$196,241,275	$200,582,702	$204,924,129	$209,265,557	$213,606,984	$217,948,411	$222,289,838	$226,631,265
Total	**$288,632,594**	**$295,313,592**	**$301,994,590**	**$308,675,587**	**$315,356,585**	**$322,037,583**	**$328,718,580**	**$335,399,578**	**$342,080,575**	**$348,761,573**

Notes:
Operating increases applied as simple interest (non-compounded); Principal*(1+(Rate*Year))

Source: Iowa DOT

Figure A5.5: Total forecasted operating revenue by funding source from 2019 through 2050



Source: Iowa DOT

Capital Funding

As described above, capital funding relates to revenue and funds that are intended to cover expenditures for physical assets such as vehicle procurement or transit facility construction. For those reasons, capital funding forecasts are a little more straightforward as their future costs, even when taking inflation into consideration, are easier to anticipate. The difficulty of forecasting these funds comes in the form of how they are awarded. These funds are sometimes competitive and discretionary funds or are based on temporary lines of funding such as the recent increases to 5339 Bus and Bus Facilities funds which may not persist into the future.

Due to the unpredictability of the availability of these funds, it was decided to divide these possibilities into two separate and distinct funding scenarios. Scenario 1 reflects typical funding levels in which discretionary or competitive funding such as PTIG is not available and 5339 funds reflect traditional levels which typically trended lower. Scenario 1 also assumes typical funding levels as appropriated before 2018. Scenario 2 reflects increased funding levels in which discretionary or competitive funding such as PTIG is available and 5339 funds reflect the recent increases to appropriations that were introduced in 2018. Both scenarios assumed CMAQ funding would continue to be available at the current level. Generally, funding is expected to be about 3% annual increases based on historical trends from years without major changes in transportation bills or apportionments. Figure A5.6 shows a comparison of these two funding scenarios by year from 2019 to 2050.

The funding scenario comparisons in Figure A5.6 are also represented as a stacked line chart in Figure A5.7. This graph represents a combination of layers some of which are reflected in the typical funding scenario with other layers only reflected in the increased funding scenario. In other words, the scenarios in the graph can be described as:

- **Scenario 1 (Typical Funding) =** Typical 5339 Bus and Bus facilities + CMAQ.
- **Scenario 2 (Increased Funding) =** Typical 5339 Bus and Bus facilities + Increased 5339 Bus and Bus facilities + CMAQ + PTIG + Discretionary Competitive funding.

Figure A5.6: Capital funding scenarios from 2019 through 2050

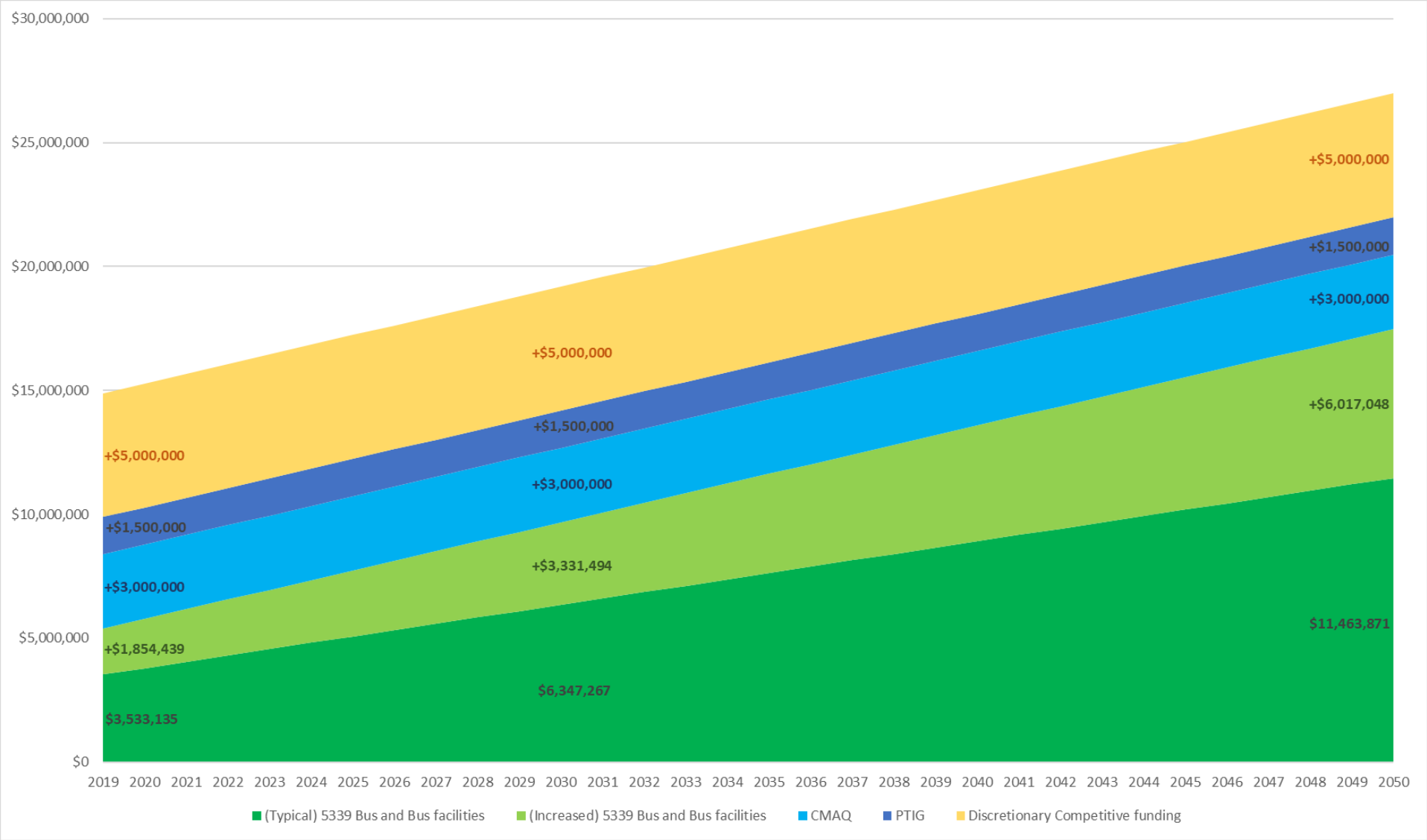
	1	2	3	4	5	6	7	8	9	10	11	12
Scenario 1. Typical Funding	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
5339 Bus and Bus facilities	$3,533,135	$3,788,965	$4,044,795	$4,300,625	$4,556,456	$4,812,286	$5,068,116	$5,323,946	$5,579,776	$5,835,607	$6,091,437	$6,347,267
CMAQ	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000
PTIG												
Total	**$6,533,135**	**$6,788,965**	**$7,044,795**	**$7,300,625**	**$7,556,456**	**$7,812,286**	**$8,068,116**	**$8,323,946**	**$8,579,776**	**$8,835,607**	**$9,091,437**	**$9,347,267**
Scenario 2. Increased Funding												
5339 Bus and Bus facilities	$5,387,574	$5,777,682	$6,167,790	$6,557,898	$6,948,006	$7,338,114	$7,728,222	$8,118,329	$8,508,437	$8,898,545	$9,288,653	$9,678,761
Increase in 5339 over typical	*$1,854,439*	*$1,988,717*	*$2,122,995*	*$2,257,272*	*$2,391,550*	*$2,525,828*	*$2,660,106*	*$2,794,383*	*$2,928,661*	*$3,062,939*	*$3,197,216*	*$3,331,494*
CMAQ	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000
PTIG	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000
Discretionary Competitive funding	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000
Total	**$14,887,574**	**$15,277,682**	**$15,667,790**	**$16,057,898**	**$16,448,006**	**$16,838,114**	**$17,228,222**	**$17,618,329**	**$18,008,437**	**$18,398,545**	**$18,788,653**	**$19,178,761**

	13	14	15	16	17	18	19	20	21	22
Scenario 1. Typical Funding	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
5339 Bus and Bus facilities	$6,603,097	$6,858,927	$7,114,758	$7,370,588	$7,626,418	$7,882,248	$8,138,078	$8,393,909	$8,649,739	$8,905,569
CMAQ	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000
PTIG										
Total	**$9,603,097**	**$9,858,927**	**$10,114,758**	**$10,370,588**	**$10,626,418**	**$10,882,248**	**$11,138,078**	**$11,393,909**	**$11,649,739**	**$11,905,569**
Scenario 2. Increased Funding										
5339 Bus and Bus facilities	$10,068,869	$10,458,977	$10,849,085	$11,239,193	$11,629,301	$12,019,408	$12,409,516	$12,799,624	$13,189,732	$13,579,840
Increase in 5339 over typical	*$3,465,772*	*$3,600,049*	*$3,734,327*	*$3,868,605*	*$4,002,883*	*$4,137,160*	*$4,271,438*	*$4,405,716*	*$4,539,993*	*$4,674,271*
CMAQ	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000
PTIG	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000
Discretionary Competitive funding	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000
Total	**$19,568,869**	**$19,958,977**	**$20,349,085**	**$20,739,193**	**$21,129,301**	**$21,519,408**	**$21,909,516**	**$22,299,624**	**$22,689,732**	**$23,079,840**

	23	24	25	26	27	28	29	30	31	32
Scenario 1. Typical Funding	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
5339 Bus and Bus facilities	$9,161,399	$9,417,229	$9,673,060	$9,928,890	$10,184,720	$10,440,550	$10,696,380	$10,952,211	$11,208,041	$11,463,871
CMAQ	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000
PTIG										
Total	**$12,161,399**	**$12,417,229**	**$12,673,060**	**$12,928,890**	**$13,184,720**	**$13,440,550**	**$13,696,380**	**$13,952,211**	**$14,208,041**	**$14,463,871**
Scenario 2. Increased Funding										
5339 Bus and Bus facilities	$13,969,948	$14,360,056	$14,750,164	$15,140,272	$15,530,380	$15,920,487	$16,310,595	$16,700,703	$17,090,811	$17,480,919
Increase in 5339 over typical	*$4,808,549*	*$4,942,826*	*$5,077,104*	*$5,211,382*	*$5,345,660*	*$5,479,937*	*$5,614,215*	*$5,748,493*	*$5,882,770*	*$6,017,048*
CMAQ	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000	$3,000,000
PTIG	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000
Discretionary Competitive funding	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000
Total	**$23,469,948**	**$23,860,056**	**$24,250,164**	**$24,640,272**	**$25,030,380**	**$25,420,487**	**$25,810,595**	**$26,200,703**	**$26,590,811**	**$26,980,919**

Source: Iowa DOT

Figure A5.7: Capital funding scenarios from 2019 through 2050



Source: Iowa DOT

Projected Costs

The projected or forecasted costs between 2019 and 2050 relied heavily on the results of the 2019 Transit Needs Survey, which described the gaps, needs, and issues that affected the public transit system as reported by the transit agencies. These costs or expenses were categorized by operating expenses which represent the daily cost of providing transit services and include everything from fuel and maintenance costs to employee salaries. The other category is capital expenses which represent the physical assets that are owned by the transit agencies such as buildings, bus stops, and buses.

Types of expenses include:

Operating Expenses

- **Operating trend:** The average annual change in historical operating costs between 2004 and 2018 was extrapolated through 2050. This served as a baseline for operating expenses given the wide variety and fluctuating nature of these types of costs which makes these values difficult to precisely forecast. Operating trend consists of fuel prices, vehicle and facility maintenance costs, employee salaries, and generally the cost of doing business and providing transit services.
- **Additional personnel:** The additional personnel costs were based on the results of the 2019 Transit Needs Survey provided by transit agencies. Existing personnel are assumed to be covered by the operating trend.

Capital Expenses

- **Facility:** Costs of purchasing or construction new transit facilities including bus stops, bus shelters, park & ride lots, vehicle maintenance buildings, vehicle storage buildings, and administrative office buildings. These needs are primarily based on results from the 2019 Transit Needs Survey provided by transit agencies.
- **Vehicle:** Cost of purchasing new transit vehicles or replacing existing vehicles that have aged beyond their expected useful life. These needs are primarily based on results from the 2019 Transit Needs Survey provided by transit agencies.

Operating Expenses

The operating expenses were primarily focused on a combination of operational cost trends to reflect daily costs of maintaining and providing transit services, and personnel costs for hiring additional needed employees between 2019 and 2050 as provided through the Transit Needs Survey completed by public transit agencies in Iowa.

Using the same assumptions as operating revenues, specifically that operating revenues equal operating costs and that average annual historical operating cost increases between 2004 and 2018 are 4.95 percent, the future or anticipated operating expenses were then calculated between 2019 and 2050 (shown in Figure A5.8). Furthermore, it is also assumed that the calculated forecasted operating costs

will also reflect changes in economic conditions, personnel costs, vehicle maintenance activities, and changes in transit services and routes. This enabled a straight trend to forecast these costs using the 4.95 percent yearly change to project that trend to the year 2050.

Figure A5.8: Average annual operating costs

	2004 - 2018 average annual costs	2019 - 2030 average annual costs	2031 - 2050 average annual costs	2019 - 2050 average annual costs
Operating	$104.076	$192.068	$318.358	$270.999

4.95%	avg Δ in operating costs per year

Source: Iowa DOT

The changing annual operational costs is also expressed per year in Figure A5.9 showing 2019 operating costs of over $141 million dollars that gradually increase at the annual rate of 4.95 percent and reaches nearly $349 million by the year 2050.

Figure A5.9: Forecasted operating costs from 2019 through 2050

# years	1	2	3	4	5	6	7	8	9	10	11	12
Operating trend	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
PROJECTED COSTS	$141,650,647	$148,331,644	$155,012,642	$161,693,640	$168,374,637	$175,055,635	$181,736,632	$188,417,630	$195,098,628	$201,779,625	$208,460,623	$215,141,621

# years	13	14	15	16	17	18	19	20	21	22
Operating trend	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
PROJECTED COSTS	$221,822,618	$228,503,616	$235,184,613	$241,865,611	$248,546,609	$255,227,606	$261,908,604	$268,589,602	$275,270,599	$281,951,597

# years	23	24	25	26	27	28	29	30	31	32
Operating trend	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
PROJECTED COSTS	$288,632,594	$295,313,592	$301,994,590	$308,675,587	$315,356,585	$322,037,583	$328,718,580	$335,399,578	$342,080,575	$348,761,573

Source: Iowa DOT

In addition to typical operating expense trends, personnel needs identified by the transit agencies were also included. For the purposes of this financial analysis, personnel were categorized into three unique employee types. These employee types represent the primary and most abundant personnel within the public transit systems throughout the state. Rarer types of positions or employees that represent only a small fraction of all transit employees were typically combined with the closest related employee type such as marketing specialists being included with administrative staff.

The three primary employee categories were utilized in the Iowa Transit Needs Survey conducted in March 2019 in the Personnel Needs section of the survey form. Personnel Needs include the number and type of employees that were needed right now (indicating existing vacancies or shortages) as well as the number and types of employees expected to be needed by the year 2030 and by the year 2050.

Types of public transit employees:

- **Administrative:** employees responsible for conducting payroll, dispatching vehicles, marketing and outreach, planning, and analysis-related activities.
- **Maintenance:** employees performing basic repairs and maintenance actions on the vehicle or facilities, such as a mechanic.
- **Drivers:** employees responsible for operating revenue vehicles to pick up and drop off passengers.

Transit agencies responded to the survey by inputting how many additional employees are needed between the current date and 2030, and then between 2030 and 2050. Administrative, Maintenance, and Driver needs were asked in terms of numbers of total full-time equivalents, which could also include part-time employees as shown in Figure A5.10.

Figure A5.10: Forecasted additional transit personnel needs from 2019 through 2050

	Large Urban			Small Urban			Regional			Total			
Employee Type	Now	2030	2050	Now	2030	2050	Now	2030	2050	Now	2030	2050	Total
Administrative	12	19	15	2	1	2	14	19	16	28	39	33	100
Maintenance	12	27	17	0	2	2	5	20	18	17	49	37	103
Driver	47	101	55	8	8	7	77	132	122	132	241	184	557

Notes:
Transit Agency Needs Survey, Survey Monkey, March 2019
Questions 26, 27, and 28
Personnel needs represented as FTEs (full time equivalent) and do not include volunteers

Source: Iowa DOT

After the aggregated totals for each employee type were determined, they were divided by the number of years in the short-term planning horizon of 2019 through 2030 consisting of 12 yearly periods and the long-term planning horizon of 2031 through 2050 consisting of 20 yearly periods. The intent is to multiply the total number of each employee type by an average inflation-adjusted salary for each year, totaling that number before adding it to the final forecasted operational costs (which already includes the operational trend estimate described in the previous section).

Cost estimates for personnel salaries were gathered through the combination of a few different sources. The Iowa Public Transit Association (IPTA) conducted a salary survey in 2017 by asking each transit agency to voluntarily provide numbers of employees, the

types of positions that they were, and how much those positions were compensated or paid, as shown in Figure A5.11. Not all transit agencies responded with 40 percent of agencies electing not to participate in the survey. Another 6 percent participated but did not share their agency name or indicate whether they were a large urban, small urban, or regional transit system. Those responses are categorized as 'Unknown' for the purposes of this analysis. Otherwise, approximately 14 percent of responses were from small urban systems, another 9 percent by large urbans, and over 31 percent of responses were provided by regional systems.

When examined individually (Figure A5.12 – Figure A5.14), both small urban and regional systems had similar response rates of roughly 70 percent (5 of 7 small urbans and 11 of 16 regionals), while large urbans saw only 25 percent responding (3 out of 12 large urban transit agencies). There were several Unknown agencies that responded and could have been among the different sized systems as well.

Besides the transit system response rates, there were a few additional considerations that needed to be accounted for in order for the results to be utilized in this financial analysis. Firstly, the employee types were slightly different from the three categories used in the 2019 Transit Needs Survey (Administrative, Maintenance, and Driver). The 2017 IPTA Salary Survey classified employees as Admin/Clerical, Driver, Maintenance, Support/Operations, and Director/Manager.

While Admin/Clerical and Driver were fairly straightforward comparisons with Administrative and Driver, the other categories required a bit more thought in order to determine how to handle them. The Director/Manager employee type used in the IPTA Salary Survey was not considered as part of this financial analysis. The number of employees in this classification, when compared to all of the other types combined, represented a very small fraction. As such, this category was disregarded.

Maintenance and Support/Operations were examined, and due to their small numbers but similar salaries, it was decided to combine these and average their wages. This was decided due to the fact that the 2019 Transit Needs Survey had various comments indicating that maintenance personnel would cover other responsibilities plus their vehicle mechanic or maintenance activities. Operational duties such as dispatch and communications were also assumed to sometimes fall within the additional duties of maintenance employees.

The salary information that was reported in the transit agency responses were also somewhat inconsistent. Some agencies reported this information in terms of annual salary while other agencies reported approximate hourly wages. An hourly-to-salary calculator[2] was utilized in order to standardize this information for consistency and used to populate the table in Figure A5.15 using an assumption of 40-hour work weeks and 52 work weeks in a year.

[2] "Convert my hourly wage to an equivalent annual salary", CalcXML, https://www.calcxml.com/calculators/convert-hourly-to-salary

Figure A5.11: 2017 IPTA salary survey responses

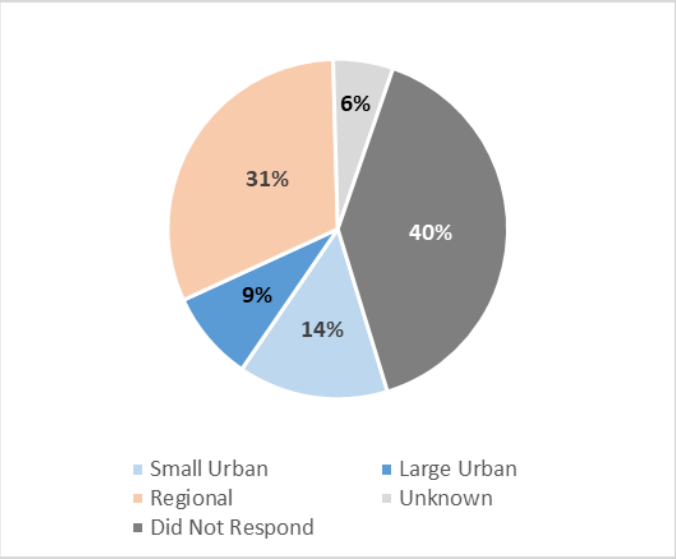


Figure A5.12: 2017 IPTA salary survey responses (Small Urban)

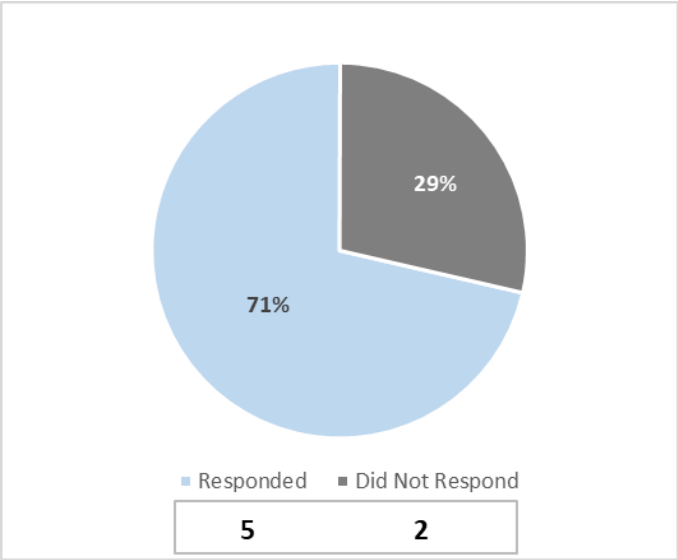
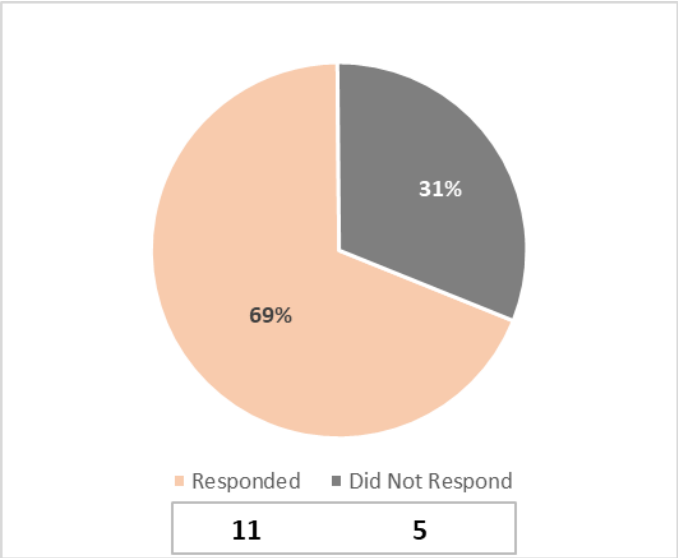
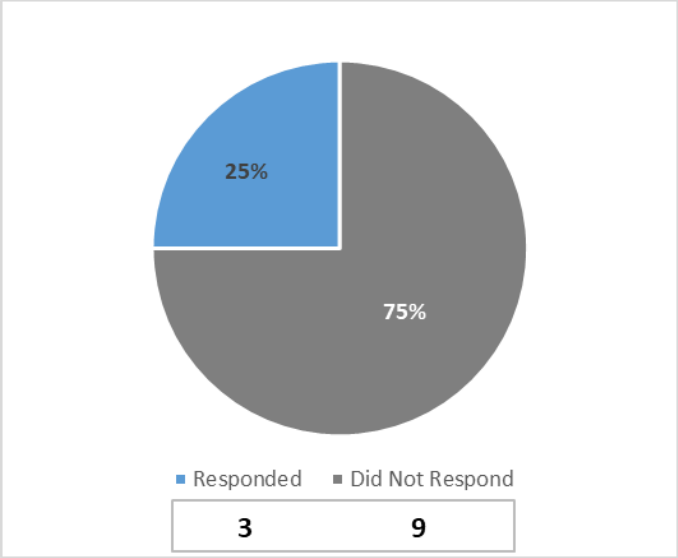


Figure A5.13: 2017 IPTA salary survey responses (Regional)



Source: Iowa Public Transit Association

Figure A5.14: 2017 IPTA salary survey responses (Large Urban)



Source: Iowa Public Transit Association

Figure A5.15: Average hourly and annual wages for transit personnel by employee

	Admin/Clerical		Driver		Maintenance		Maintenance		Support/Operations		Director/Manager	
	Renamed		*No Change*		*Averaged with Support*		*Combined*		*Combined*		*Removed*	
Transit Agency	Mean hourly wage	Annual mean wage	Mean hourly wage	Annual mean wage	Mean hourly wage	Annual mean wage	Mean hourly wage	Annual mean wage	Mean hourly wage	Annual mean wage	Mean hourly wage	Annual mean wage
Small Urban	$17.13	$35,634	$14.52	$30,199	$21.03	$41,924	$19.93	$41,343	$22.13	$42,505	$29.75	$59,503
Large Urban	$14.99	$31,170	$14.00	$29,120	$14.75	$30,680	$14.75	$30,680	$14.75	$30,680	$32.46	$67,511
Regional	$16.39	$34,100	$13.20	$27,457	$19.38	$40,464	$20.92	$43,514	$17.85	$37,413	$31.64	$65,818
Unknown	$15.50	$32,240	$14.42	$29,984	$15.78	$32,812	-	-	$15.78	$32,812	$34.13	$70,988

Source: Iowa Public Transit Association

For context, an average salary was calculated across all Iowa transit agencies and used to compare against the United States Department of Labor's Bureau of Labor Statistics (BLS) data from 2017[3] of similar positions in Iowa. A variety of BLS occupations were selected, particularly as comparisons to the Driver position in order to better understand the challenges of hiring these types of employees. 'Office and Administrative Support Occupations', 'Bus and Truck Mechanics and Diesel Engine Specialists', and 'Bus Drivers, Transit and Intercity' were selected as direct comparisons against Administrative, Maintenance, and Driver transit employee types. Additional occupations of 'Bus Drivers, School or Special Client', 'Heavy and Tractor-Trailer Truck Drivers', 'Light Truck or Delivery Services Drivers', 'Industrial Truck and Tractor Operators', and 'Taxi Drivers and Chauffeurs' were also selected to compare to the Driver category of transit employees.

As shown in Figure A5.16, transit employees were almost universally at a disadvantage when compared to their peers in similar industries across Iowa with annual mean wages being 10 percent lower or greater in terms of pay and compensation. This was especially pronounced for Drivers who are paid nearly 30 percent less than a heavy truck or semi driver. The only positions that were paid less than a transit employee are taxi drivers and chauffeurs who are paid substantially less than transit bus drivers.

After seeing these results, it puts into greater focus the difficult situation most transit agency directors find themselves in when trying to hire new or retain existing employees. In the case of drivers, the need for a CDL (Commercial Driver's License) becomes a kind of double-edged sword at times. Transit agency directors may use the promise of help obtaining a CDL for a prospective new driver, only to find that the driver leaves the transit agency for a truck driving position which can make upwards of an additional $10,000 or more a year as

[3] United States Department of Labor - Bureau of Labor Statistics, "May 2017 State Occupational Employment and Wage Estimates", https://www.bls.gov/oes/2017/may/oes_ia.htm

an annual salary. This situation assuredly becomes more complicated when unemployment numbers across Iowa are low, making competition for hiring employees, especially drivers, much more difficult.

Figure A5.16: Average hourly and annual wages for transit personnel by employee type

May 2017 State Occupational Employment and Wage Estimates
Iowa https://www.bls.gov/oes/2017/may/oes_ia.htm

BLS Occupational Data							Comparison to IPTA Data				
Occupation code	Occupation title	Employment	Employment per 1,000 jobs	Median hourly wage	Mean hourly wage	Annual mean wage	Similar Transit Occupations	Mean hourly wage	Annual mean wage	Δ Annual mean ($)	Δ Annual mean (%)
43-0000	Office and Administrative Support Occupations	220,090	143.341	$16.44	$17.46	$36,310	Administrative	$16.00	$33,286	-$3,024	-8.33%
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	4,160	2.711	$19.87	$20.44	$42,500	Maintenance	$18.01	$36,992	-$5,508	-12.96%
53-3021	Bus Drivers, Transit and Intercity	1,750	1.14	$15.92	$17.21	$35,800	Driver	$14.03	$29,190	-$6,610	-18.46%
53-3022	Bus Drivers, School or Special Client	5,360	3.491	$16.92	$17.08	$35,520	Driver	$14.03	$29,190	-$6,330	-17.82%
53-3032	Heavy and Tractor-Trailer Truck Drivers	38,110	24.819	$19.36	$20.46	$42,570	Driver	$14.03	$29,190	-$13,380	-31.43%
53-3033	Light Truck or Delivery Services Drivers	8,540	5.561	$14.74	$16.30	$33,910	Driver	$14.03	$29,190	-$4,720	-13.92%
53-7051	Industrial Truck and Tractor Operators	6,580	4.284	$16.91	$17.11	$35,580	Driver	$14.03	$29,190	-$6,390	-17.96%
53-3041	Taxi Drivers and Chauffeurs	1,500	0.975	$11.08	$11.76	$24,460	Driver	$14.03	$29,190	$4,730	19.34%

Sources: Bureau of Labor Statistics, Iowa Public Transit Association

Figures A5.17 – A5.20 show comparisons between the BLS occupations that closely matched with the three transit agency employee types, and examined transit agency types with small urban, large urban, regional, and unknown agencies separated. This allowed for a more in-depth examination on the differences between transit agencies and compensation of employees. The findings all somewhat mirror the overall results shown above in Figure A5.16, however, there are some variations between transit agencies to note.

Interestingly, small urban transit agencies exhibited the smallest differences in salaries compared with similar BLS occupations for Administrative and Maintenance employees. There is nothing within the data that makes it apparent as far as an explanation, however, population size and availability of alternative or similar employment opportunities may have encouraged the small urban transit systems to pay its employees differently. There may be similarities with regional transit systems as well, who are also noted as compensating its employees within a few percentage points of the BLS equivalent occupations. All transit agencies, regardless of size and type, appear to compensate drivers much lower than the equivalent BLS occupations though, and this is likely a significant contributor to the shortages of qualified bus drivers with CDL certifications that transit agencies experience.

Figure A5.17: Small urban transit personnel wage comparison to U.S. Department of Labor – Bureau of Labor Statistics

US Dept Labor BLS			Small Urban				
Occupation title	Mean hourly wage	Annual mean wage	Similar transit occupations	Mean hourly wage	Annual mean wage	Δ Annual mean ($)	Δ Annual mean (%)
Office and Administrative Support Occupations	$17.46	$36,310	Administrative	$17.13	$35,634	-$676	-1.86%
Bus and Truck Mechanics and Diesel Engine Specialists	$20.44	$42,500	Maintenance	$21.03	$41,924	-$576	-1.36%
Bus Drivers, Transit and Intercity	$17.21	$35,800	Driver	$14.52	$30,199	-$5,601	-15.65%

Figure A5.18: Large urban transit personnel wage comparison to U.S. Department of Labor – Bureau of Labor Statistics

US Dept Labor BLS			Large Urban				
Occupation title	Mean hourly wage	Annual mean wage	Similar transit occupations	Mean hourly wage	Annual mean wage	Δ Annual mean ($)	Δ Annual mean (%)
Office and Administrative Support Occupations	$17.46	$36,310	Administrative	$14.99	$31,170	-$5,140	-14.16%
Bus and Truck Mechanics and Diesel Engine Specialists	$20.44	$42,500	Maintenance	$14.75	$30,680	-$11,820	-27.81%
Bus Drivers, Transit and Intercity	$17.21	$35,800	Driver	$14.00	$29,120	-$6,680	-18.66%

Figure A5.19: Regional transit personnel wage comparison to U.S. Department of Labor – Bureau of Labor Statistics

US Dept Labor BLS			Regional				
Occupation title	Mean hourly wage	Annual mean wage	Similar transit occupations	Mean hourly wage	Annual mean wage	Δ Annual mean ($)	Δ Annual mean (%)
Office and Administrative Support Occupations	$17.46	$36,310	Administrative	$16.39	$34,100	-$2,210	-6.09%
Bus and Truck Mechanics and Diesel Engine Specialists	$20.44	$42,500	Maintenance	$19.38	$40,464	-$2,036	-4.79%
Bus Drivers, Transit and Intercity	$17.21	$35,800	Driver	$13.20	$27,457	-$8,343	-23.30%

Figure A5.20: Unknown transit personnel wage comparison to U.S. Department of Labor – Bureau of Labor Statistics

US Dept Labor BLS			Unknown				
Occupation title	Mean hourly wage	Annual mean wage	Similar transit occupations	Mean hourly wage	Annual mean wage	Δ Annual mean ($)	Δ Annual mean (%)
Office and Administrative Support Occupations	$17.46	$36,310	Administrative	$15.50	$32,240	-$4,070	-11.21%
Bus and Truck Mechanics and Diesel Engine Specialists	$20.44	$42,500	Maintenance	$15.78	$32,812	-$9,688	-22.80%
Bus Drivers, Transit and Intercity	$17.21	$35,800	Driver	$14.42	$29,984	-$5,817	-16.25%

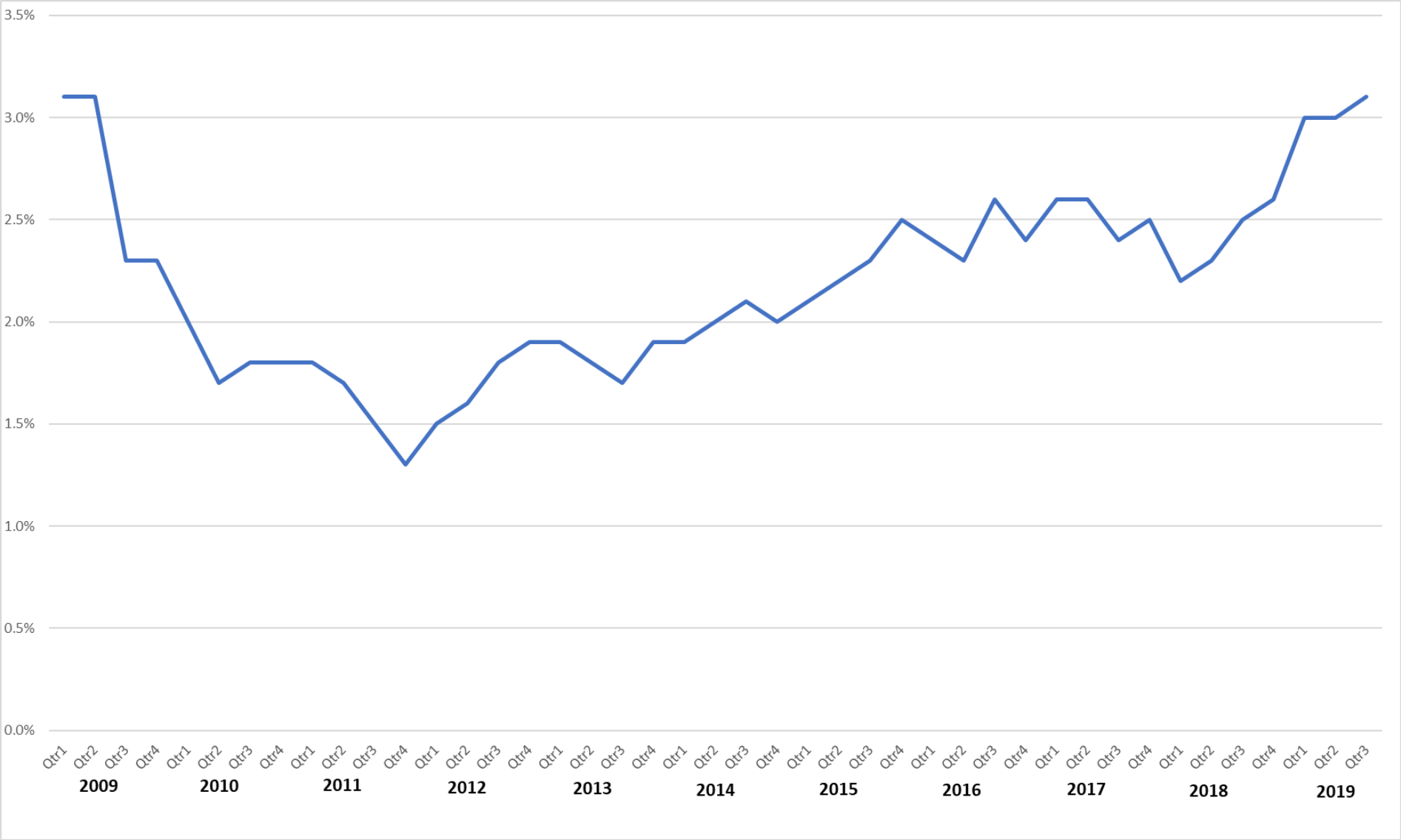
Sources: Bureau of Labor Statistics, Iowa Public Transit Association

The primary output from the BLS and IPTA salary analysis was to help inform the assumptions regarding annual wages for new personnel. This was then used to calculate projected personnel costs to the year 2050. Having the 2017 IPTA Salary Survey results as well as the 2017 BLS occupational data allowed for those two sets of information to be averaged together to account for any missing feedback from the transit agencies in addition to helping account for any possible salary increases that the transit agencies may decide to institute in the future, bringing wages more in line with statewide mean wages for those occupations.

It was necessary to apply inflation to the wages for the transit occupation types. The Employment Cost Index[4] is a factor that measures the change in value of labor costs over time in order to reflect this inflationary effect on forecasted personnel cost estimates. For this analysis, total compensation for State and local government workers in all industries was considered. The Employment Cost Index was gathered by quarter from 2009 to 2019, shown in Figure A5.21. Averaging these values resulted in a final inflation value of 2.2 percent.

[4] "Employment Cost Index (ECI) 2009 – 2019", United States Department of Labor - Bureau of Labor Statistics, https://www.bls.gov/ppi/#tables

Figure A5.21: Quarterly Employment Cost Index (ECI) from 2009 – 2019



Source: Bureau of Labor Statistics

Combining the employee salary estimate values plus the average yearly inflation rate resulted in the future projection of personnel costs, shown in Figure A5.22. The upper salary amounts were based on the BLS salary data while the lower salary amounts were based on the IPTA salary survey results. For the purposes of this financial analysis, an average of those two salary levels were taken and utilized for the forecasted additional personnel costs from 2019 through 2050.

Figure A5.22: Personnel annual salary estimates by employee type

Employee Type	Lower Cost	Average Cost	Upper Cost	Data Year	Inflation Rate
Administrative	$33,286	$34,798	$36,310	2017	2.20%
Maintenance	$36,992	$39,746	$42,500	2017	2.20%
Driver	$29,190	$32,495	$35,800	2017	2.20%

Notes:

Upper cost values are from US Department of Labor - Bureau of Labor Statistics, May 2017 State Occupational Employment and Wage Estimates, Iowa; https://www.bls.gov/oes/2017/may/oes_ia.htm#43-0000

Lower cost values are from Iowa Public Transit Association (IPTA) Salary Survey as of 7.31.17

Average cost values calculated as an average between the lower and upper cost values, and utilized for the projected personnel costs between 2019 - 2050

2.2% inflation costs derived from 10 year average (2009-2019) of ECI employment data for state and federal government employees

Inflation rate applied to average cost as simple interest (non-compounded); Principal*(1+(Rate*Year))

Source: Iowa DOT

Multiplying the inflation-adjusted salary for each employee type in Figure A5.22 with the total personnel needs in Figure A5.10 yields the yearly totals per year in Figure A5.23. Since personnel needs in the 2019 Transit Needs Survey were reported only as an aggregate by 2030 and 2050, the staffing numbers were evenly distributed in the years in between, from 2019 through 2030, and 2031 through 2050.

The results in Figure A5.23 were then depicted graphically as a stacked line chart in Figure A5.24 depicting short-term (2019 – 2030) and long-term (2031 – 2050) totals for each employee type. The takeaway from these graphs show a much higher need for drivers throughout the entire planning horizon, which indicates an existing and continuing need for the foreseeable future. With the large discrepancies between the 2017 IPTA Salary Survey reported wages when compared to the reported wages by BLS for similar types of jobs throughout Iowa, one could reasonably conclude that employment challenges are due in no small part to lagging wages and this will continue to be a challenge for all transit agencies.

Figure A5.23: Additional personnel annual salary estimates by employee type

Transit personnel costs by year (2019 - 2030)

Employee Type	1 2019	2 2020	3 2021	4 2022	5 2023	6 2024	7 2025	8 2026	9 2027	10 2028	11 2029	12 2030
Administrative	$1,017,215	$1,170,168	$1,328,550	$1,492,360	$1,661,598	$1,836,265	$2,016,361	$2,201,885	$2,392,837	$2,589,218	$2,791,027	$2,998,265
Maintenance	$705,412	$909,013	$1,120,404	$1,339,585	$1,566,556	$1,801,318	$2,043,869	$2,294,211	$2,552,344	$2,818,266	$3,091,979	$3,373,481
Driver	$4,478,071	$5,331,360	$6,215,974	$7,131,914	$8,079,179	$9,057,769	$10,067,684	$11,108,924	$12,181,489	$13,285,380	$14,420,596	$15,587,137
Total	**$6,200,698**	**$7,410,541**	**$8,664,928**	**$9,963,858**	**$11,307,333**	**$12,695,351**	**$14,127,914**	**$15,605,020**	**$17,126,670**	**$18,692,864**	**$20,303,602**	**$21,958,883**

Notes:
Personnel staffing evenly distributed between 2019 - 2030
No feasible or equitable means available to distribute personnel hiring out by priority or by agency type (large urban, small urban, regional)

Transit personnel costs by year (2031 - 2040)

Employee Type	13 2031	14 2032	15 2033	16 2034	17 2035	18 2036	19 2037	20 2038	21 2039	22 2040
Administrative	$3,124,659	$3,253,578	$3,385,024	$3,518,996	$3,655,495	$3,794,520	$3,936,071	$4,080,149	$4,226,753	$4,375,883
Maintenance	$3,527,370	$3,684,494	$3,844,853	$4,008,448	$4,175,278	$4,345,343	$4,518,643	$4,695,179	$4,874,950	$5,057,957
Driver	$16,244,822	$16,915,662	$17,599,656	$18,296,804	$19,007,105	$19,730,561	$20,467,171	$21,216,934	$21,979,852	$22,755,924
Total	**$22,896,851**	**$23,853,734**	**$24,829,533**	**$25,824,248**	**$26,837,878**	**$27,870,424**	**$28,921,885**	**$29,992,262**	**$31,081,555**	**$32,189,764**

Notes:
Personnel staffing evenly distributed between 2031 - 2040.
No feasible or equitable means available to distribute personnel hiring out by priority or by agency type (large urban, small urban, regional)

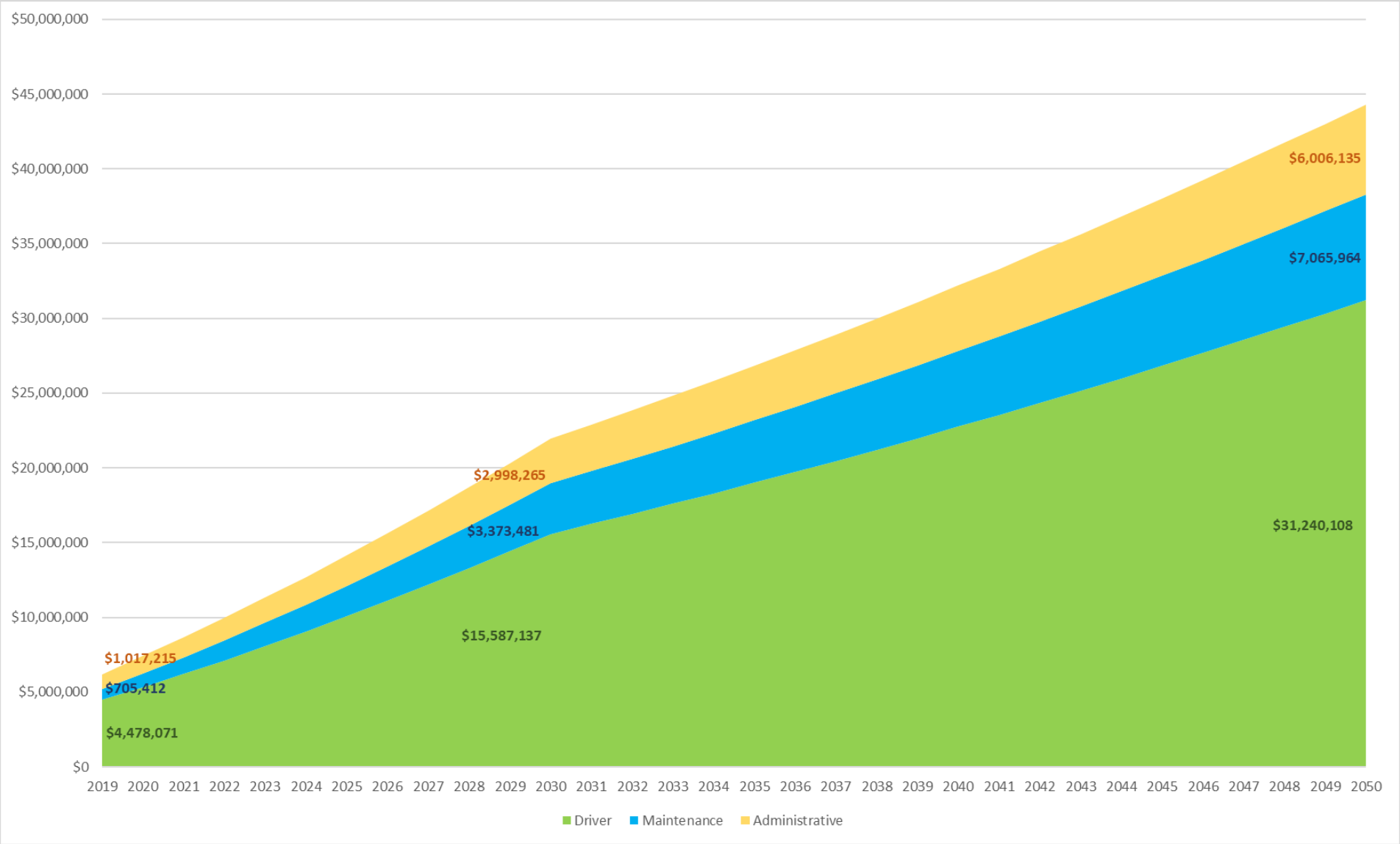
Transit personnel costs by year (2041 - 2050)

Employee Type	23 2041	24 2042	25 2043	26 2044	27 2045	28 2046	29 2047	30 2048	31 2049	32 2050
Administrative	$4,527,540	$4,681,723	$4,838,432	$4,997,668	$5,159,430	$5,323,718	$5,490,533	$5,659,874	$5,831,741	$6,006,135
Maintenance	$5,244,199	$5,433,676	$5,626,388	$5,822,336	$6,021,519	$6,223,937	$6,429,591	$6,638,480	$6,850,605	$7,065,964
Driver	$23,545,149	$24,347,529	$25,163,062	$25,991,750	$26,833,591	$27,688,587	$28,556,736	$29,438,039	$30,332,497	$31,240,108
Total	**$33,316,888**	**$34,462,927**	**$35,627,883**	**$36,811,753**	**$38,014,540**	**$39,236,242**	**$40,476,860**	**$41,736,393**	**$43,014,843**	**$44,312,207**

Notes:
Personnel staffing evenly distributed between 2041 - 2050
No feasible or equitable means available to distribute personnel hiring out by priority or by agency type (large urban, small urban, regional)

Source: Iowa DOT

Figure A5.24: Forecasted additional transit personnel costs



Source: Iowa DOT

Capital Expenses

The capital expenses calculated in this product were primarily focused on facility and vehicle needs forecasted between 2019 and 2050 through the Transit Needs Survey completed by public transit agencies in Iowa.

Facilities for the purposes of this financial analysis were categorized into five unique facility types. These facility types represent nearly all passenger transportation or transit-related infrastructure throughout the state and represent generalized structures that might include several different and distinct functions, such as wash racks and maintenance repair bays. These categories were utilized in the Iowa Transit Needs Survey conducted in March 2019 in the Facility Needs section of the survey form. Facility Needs include maintenance areas (including wash racks, wash bays), revenue vehicle storage areas, administrative/offices (including internal needs such as office/storage space as well as site needs such as parking spaces and walkways), bus shelters, and park and ride facilities.

Types of public transit facilities:

- **Vehicle storage:** areas and buildings that serve as storage and protection for transit vehicles such as buses.
- **Vehicle maintenance:** areas where basic repairs and maintenance activities take place. These can also include wash racks and wash bays.
- **Administrative office:** areas that support the internal staff operations of the transit agency, such as office activities.
- **Bus shelter:** enclosures to protect passengers as they wait at transit stops along established bus routes.
- **Park and ride:** parking lots where passengers can leave their vehicles while they take the bus. Park and ride lots can be constructed in a variety of configurations with surface types consisting of gravel (mainly in rural settings) or pavement.

Transit agencies responded by inputting how much additional facility space is needed between the current date and 2030, and then between 2030 and 2050. Administrative offices and internal space, administrative parking and external space, vehicle maintenance, and vehicle storage facilities were asked in terms of total square footage. Park and ride lots and bus shelters were asked in terms of total number of locations. Note that for facilities asked in terms of total square footage, this value represents all facilities classified in a particular category and does not reflect the total number of buildings that consist of the aggregated total square footage as shown in Figure A5.25. Additionally, administrative parking and external space was not utilized in the final cost estimates. This was due partly to lack of a cost per square footage value for these areas as well as the assumption by staff that the administrative building estimates by the National Cooperative Highway Research Program already include those areas into the overall cost.

Figure A5.25: Transit facility needs for large urban, small urban, and regional systems by facility type and years 2030 and 2050

	Large Urban		Small Urban		Regional		Total	
Facility Type	2030	2050	2030	2050	2030	2050	2030	2050
Administrative Office (sq ft)	25,055	17,200	1,144	1,000	28,200	17,000	54,399	35,200
Vehicle Maintenance (sq ft)	102,402	34,860	3,000	3,000	41,000	47,100	146,402	84,960
Vehicle Storage (sq ft)	166,312	118,160	11,440	6,880	191,500	58,000	369,252	183,040
Bus Shelter (#)	203	317	16	15	4	6	223	338
Park & Ride (#)	13	22	0	0	9	10	22	32

Notes:
Transit Agency Needs Survey, Survey Monkey, March 2019
Questions 20 and 21

Sources: Iowa DOT, Survey Monkey

After the aggregated totals for each facility type were determined, they were divided by the number of years in the short-term planning horizon of 2019 through 2030 consisting of 12 yearly periods and the long-term planning horizon of 2031 through 2050 consisting of 20 yearly periods. Additionally, park and ride facilities were assumed to be paved if counted within a large or small urban system and as granular if counted with a regional system as shown in Figure A5.26. The intent is to then multiply the total square footage and total number of each facility for each year by an inflation-adjusted cost for each type of facility.

Figure A5.26: Transit facility construction needs by year, evenly distributed (2019 – 2030, 2031 – 2050)

Facility Type	2019 - 2030	2031 - 2050
Administrative Office (sq ft)	4,533	1,760
Vehicle Maintenance (sq ft)	12,200	4,248
Vehicle Storage (sq ft)	30,771	9,152
Bus Shelter (#)	18.58	16.90
Park & Ride (granular) (#)	0.75	0.50
Park & Ride (paved) (#)	1.08	1.10

Source: Iowa DOT

Cost estimates per square foot or per unit were gathered from several different sources. Estimates for administrative office, vehicle maintenance, and vehicle storage facilities were derived from a 2015 study by the National Cooperative Highway Research Program (NCHRP).[5] The NCHRP report referenced in Figure A5.27 is a product of the Transportation Research Board of The National Academies of Sciences, Engineering, and Medicine. This study centered on estimating design and construction costs of rural and small urban transit facilities which broke down costs by the same facility categories that were used in the Iowa Transit Needs survey. Maintenance facilities were given a flat $300 per square foot average, however administrative and bus storage facilities had ranges of $150 - $200 and $125 - $250 per square foot averages, respectively. Mid-points between those ranges of $175 and $188 were utilized in the final cost estimates.

Bus shelter cost estimates shown in Figure A5.28 were gathered by LT Leon Associates Inc. as part of Iowa DOT's Americans with Disabilities Act (ADA) compliance assessments in 2018.[6] Part of the information gathering included cost estimates for replacing an entire bus shelter with a range between $10,000 - $15,000. LT Leon used past bid information from Des Moines Area Regional Transit Authority (DART), Sioux City Transit System, and the City of Council Bluffs. A mid-point average of $12,500 was used in the final cost estimate.

Cost estimates for park and ride facilities were referenced from the 2014 Iowa Park and Ride System Plan[7] in Figure A5.29. The plan includes estimates for gravel and paved lots with an average size of 12,000 square feet, enough for approximately 26 vehicles. For the purposes of this cost estimate, urban park and rides were

Figure A5.27: Transit facility cost estimates for admin, vehicle maintenance, and storage

Table 2 Unit costs of transit facilities.

Facility Type	Unit Cost
Administration	$150–$200/ft²
Maintenance	$300/ft² (The cost depends on what kind of maintenance service is performed.)
Open bus storage	$125–$250/ft²

Source: TRB

Figure A5.28: Transit facility cost estimates for bus shelters

Improvements and Costs

For planning and budgeting purposes, improving non-compliant transit facilities to become compliant can be broken down into four typical project groups. A typical cost will be assigned to each project group. The four groups include:

- Major Project with Shelter
  - Estimated $25,000-$40,000 ($10,000-$15,000 for the shelter)
  - Includes complete replacement of the existing noncompliant facility
  - Associated costs could include removal of existing shelter and concrete, installation of new concrete, installation of new shelter, minor excavation and seeding, utility improvements, new signage, permitting, and traffic control

Source: LT Leon Associates Inc.

Figure A5.29: Transit facility cost estimates for park and ride

Table 6.2: Surface construction cost estimates (per square foot)

	Paved	Granular
Earthwork	$1.10	$1.10
Special backfill	$1.10	N/A
7-inch Portland cement concrete pavement	$3.70	N/A
Granular surface	N/A	$0.70
Unquantified items*	$2.90	$2.90
TOTAL	**$8.80**	**$4.70**

*Unquantified items include drainage structures, erosion control, traffic control, lighting, and signage.
Source: Iowa DOT, Office of Design (2014)

Source: Iowa DOT

[5] National Academies of Sciences, Engineering, and Medicine. 2015. Independent Cost Estimates for Design and Construction of Transit Facilities in Rural and Small Urban Areas. Washington, DC: The National Academies Press. https://doi.org/10.17226/22086

[6] LT Leon Associates Inc. Technical Memorandum "ADA Requirements for Transit Facilities", April 4, 2018

[7] Iowa Department of Transportation, "Iowa Park and Ride System Plan", 2014, https://iowadot.gov/iowainmotion/files/StatewideParkandRideSystemPlanFINAL.pdf

assumed to be paved and rural park and rides were assumed to be gravel or granular for $8.80 and $4.70 per square foot on average.

After gathering cost estimates for all the types of transit facilities, it was necessary to apply inflation to each since the data for each of them was gathered in different time periods. The Producer Price Index (PPI)[8] is a factor that can be applied to the cost estimates that can account for the change in value for costs over time and reflect this inflationary effect on the estimates. For new facility construction, PPI was gathered specific to non-residential (commercial) construction in the Midwest for the prior five-year period from 2014 to 2018, shown in Figure A5.30. Averaging these values resulted in a final PPI inflation value of 2.14 percent.

Figure A5.30: PPI industry data for new nonresidential building construction for Midwest region, not seasonally adjusted

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014		100.0	100.0	100.3	100.4	100.5	100.4	100.5	100.5	100.9	100.9	101.0
2015	101.3	101.4	101.3	101.0	101.1	101.1	101.5	101.7	101.8	102.4	102.2	102.3
2016	102.0	102.0	101.9	103.0	102.6	102.6	101.8	101.7	101.7	102.7	102.6	102.4
2017	102.8	102.9	102.8	103.3	103.5	103.6	105.1	105.2	105.1	105.9	105.6	105.4
2018	106.2	106.3	106.4	107.3	107.4	107.7	108.1	108.4	108.5	110.3	110.5	110.7
											Avg PPI/facility inflation	2.14%

Source: United States Department of Labor - Bureau of Labor Statistics

Combining the facility cost estimate values, the year the costs were originally calculated, plus the average yearly inflation rate resulted in the values in Figure A5.31. These costs were then used in the future projection of facility costs in combination with the transit facility needs identified from the Transit Needs Survey (shown in Figure A5.26). In order to bring these cost estimates up to date for the beginning year of 2019, the inflation rate needed to be applied to the years between the original data year and 2019 first.

Figure A5.31: Transit facility costs per square foot by year (2019 – 2050) with inflation

Facility Type	Lower Cost	Average Cost	Upper Cost	Data Year	Inflation Rate
Administration (per sq ft)	$150	$175	$200	2015	2.14%
Maintenance (per sq ft)		$300		2015	2.14%
Open bus storage (per sq ft)	$125	$188	$250	2015	2.14%
Bus shelter (per unit)	$10,000	$12,500	$15,000	2018	2.14%
Park & Ride granular (per sq ft)		$4.70		2014	2.14%
Park & Ride paved (per sq ft)		$8.80		2014	2.14%

Source: Iowa DOT

[8] "The Producer Price Index (PPI)", United States Department of Labor - Bureau of Labor Statistics, https://www.bls.gov/ppi/#tables

Multiplying the inflation-adjusted costs for each facility type in Figure A5.31 with the total facility needs in Figure A5.26 yields the yearly totals per year in Figure A5.32.

Figure A5.32: Transit facility costs per year (2019 – 2050) with inflation

Transit facility costs by year (2019 - 2030)

	1	2	3	4	5	6	7	8	9	10	11	12
Facility Type	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Administrative Office	$861,227	$878,204	$895,181	$912,158	$929,135	$946,112	$963,089	$980,066	$997,043	$1,014,020	$1,030,997	$1,047,974
Vehicle Maintenance	$3,973,350	$4,051,675	$4,130,000	$4,208,325	$4,286,651	$4,364,976	$4,443,301	$4,521,626	$4,599,951	$4,678,276	$4,756,601	$4,834,926
Vehicle Storage	$6,280,140	$6,403,937	$6,527,735	$6,651,533	$6,775,331	$6,899,129	$7,022,927	$7,146,725	$7,270,523	$7,394,321	$7,518,118	$7,641,916
Bus Shelter	$237,263	$242,234	$247,205	$252,176	$257,147	$262,118	$267,089	$272,060	$277,031	$282,002	$286,973	$291,944
Park & Ride (granular)	$46,826	$47,731	$48,637	$49,542	$50,447	$51,352	$52,257	$53,163	$54,068	$54,973	$55,878	$56,784
Park & Ride (paved)	$126,641	$129,089	$131,537	$133,985	$136,433	$138,882	$141,330	$143,778	$146,226	$148,674	$151,122	$153,571
Total	**$11,525,446**	**$11,752,871**	**$11,980,295**	**$12,207,719**	**$12,435,144**	**$12,662,568**	**$12,889,993**	**$13,117,417**	**$13,344,841**	**$13,572,266**	**$13,799,690**	**$14,027,115**

Transit facility costs by year (2031 - 2040)

	13	14	15	16	17	18	19	20	21	22
Facility Type	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Administrative Office	$413,459	$420,050	$426,642	$433,233	$439,824	$446,415	$453,006	$459,598	$466,189	$472,780
Vehicle Maintenance	$1,710,755	$1,738,027	$1,765,299	$1,792,571	$1,819,843	$1,847,115	$1,874,388	$1,901,660	$1,928,932	$1,956,204
Vehicle Storage	$2,309,701	$2,346,522	$2,383,342	$2,420,162	$2,456,983	$2,493,803	$2,530,623	$2,567,444	$2,604,264	$2,641,084
Bus Shelter	$270,020	$274,541	$279,061	$283,582	$288,103	$292,624	$297,144	$301,665	$306,186	$310,707
Park & Ride (granular)	$38,459	$39,063	$39,666	$40,270	$40,873	$41,477	$42,080	$42,684	$43,287	$43,890
Park & Ride (paved)	$158,419	$160,905	$163,391	$165,876	$168,362	$170,848	$173,334	$175,820	$178,306	$180,791
Total	**$4,900,813**	**$4,979,107**	**$5,057,400**	**$5,135,694**	**$5,213,988**	**$5,292,282**	**$5,370,575**	**$5,448,869**	**$5,527,163**	**$5,605,457**

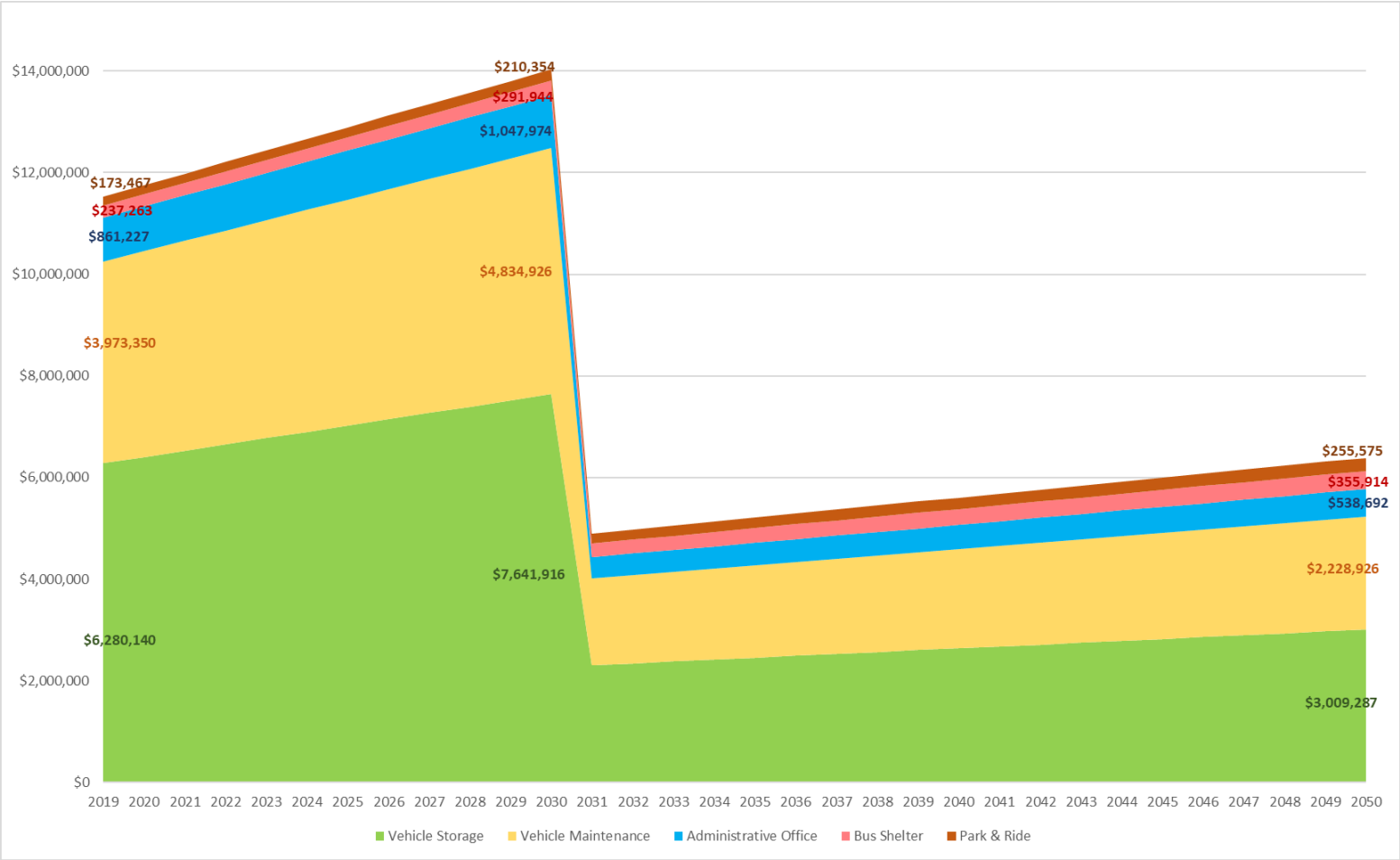
Transit facility costs by year (2041 - 2050)

	23	24	25	26	27	28	29	30	31	32
Facility Type	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Administrative Office	$479,371	$485,962	$492,554	$499,145	$505,736	$512,327	$518,918	$525,510	$532,101	$538,692
Vehicle Maintenance	$1,983,476	$2,010,748	$2,038,020	$2,065,293	$2,092,565	$2,119,837	$2,147,109	$2,174,381	$2,201,653	$2,228,926
Vehicle Storage	$2,677,904	$2,714,725	$2,751,545	$2,788,365	$2,825,186	$2,862,006	$2,898,826	$2,935,647	$2,972,467	$3,009,287
Bus Shelter	$315,227	$319,748	$324,269	$328,790	$333,310	$337,831	$342,352	$346,873	$351,393	$355,914
Park & Ride (granular)	$44,494	$45,097	$45,701	$46,304	$46,908	$47,511	$48,115	$48,718	$49,322	$49,925
Park & Ride (paved)	$183,277	$185,763	$188,249	$190,735	$193,221	$195,706	$198,192	$200,678	$203,164	$205,650
Total	**$5,683,750**	**$5,762,044**	**$5,840,338**	**$5,918,632**	**$5,996,925**	**$6,075,219**	**$6,153,513**	**$6,231,806**	**$6,310,100**	**$6,388,394**

Source: Iowa DOT

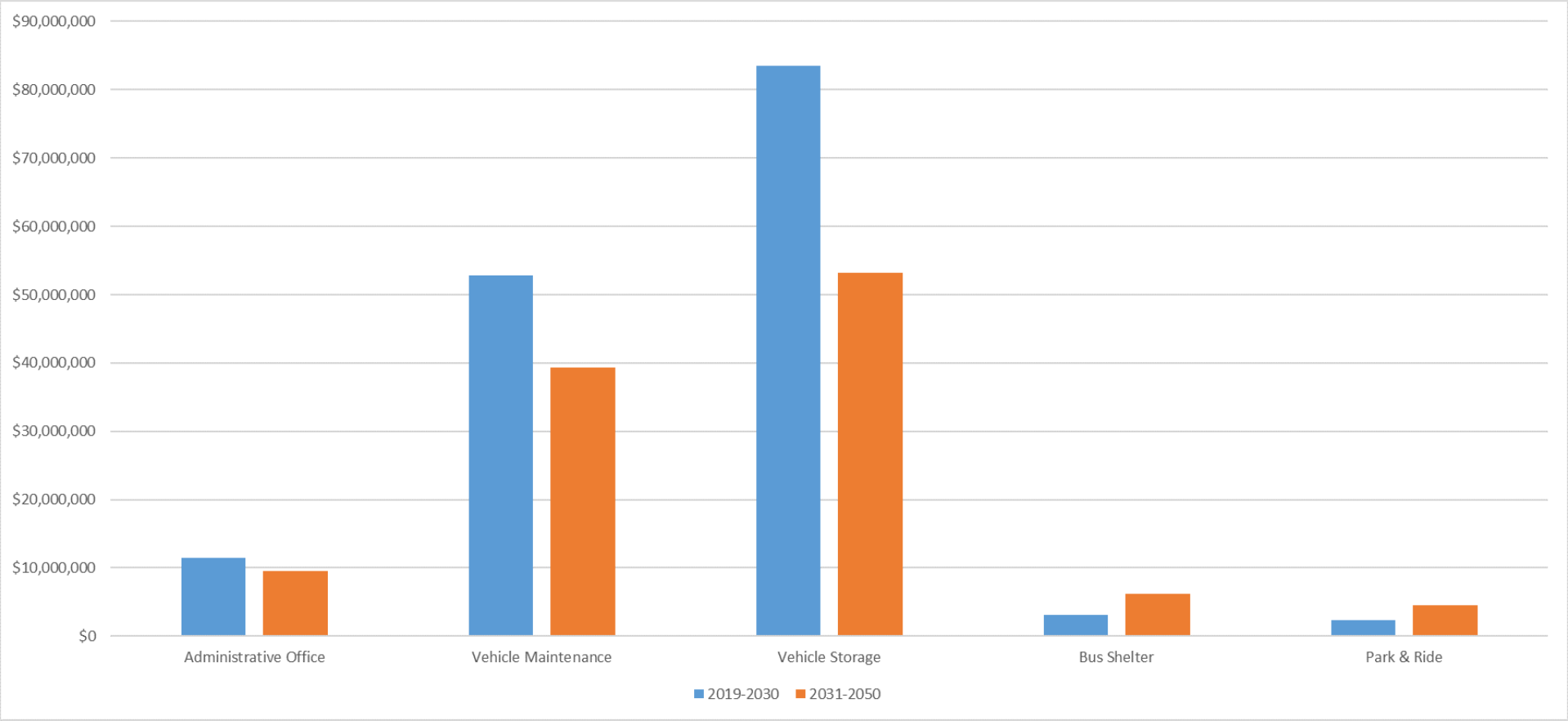
The results in Figure A5.32 were then depicted graphically as a stacked line chart in Figure A5.33 and as a bar chart in Figure A5.34 depicting short-term (2019 – 2030) and long-term (2031 – 2050) totals for each facility type. A noticeable drop in facility costs and needs can be seen between 2030 and 2031. This is a result of the way that the questions were asked in the Transit Needs Survey rather than an actual drop in facility needs between those years. The takeaway from these graphs show a much higher need for administrative offices, vehicle storage, and vehicle maintenance facilities early on but with much less need in the long term. Bus shelters and park and ride lots were seen as a slightly growing need over the planning horizon to 2050.

Figure A5.33: Forecasted transit facility costs (2019 – 2050)



Source: Iowa DOT

Figure A5.34: Forecasted transit facility costs (2019 – 2050)



Source: Iowa DOT

Like the transit facilities, vehicle needs were also obtained from the Transit Needs Survey in March 2019. The survey asked how many of each type of vehicle agencies currently need, and how many additional vehicles of each type they will need by the years 2030 and 2050.

Transit vehicles for the purposes of this financial analysis were categories into several unique types. These vehicle types represent nearly all revenue vehicle or passenger transportation-related vehicle fleets throughout the state. These categories were utilized in the Iowa Transit Needs Survey conducted in March 2019 in the Vehicle Needs section of the survey form. In the survey, needs for non-revenue vehicles were asked for of the transit agencies, however, given the low number of these vehicle needs and lower cost compared to revenue vehicles, these numbers were not utilized in the final cost estimates. These non-revenue vehicles include administrative sedans, administrative vans, maintenance pick-up trucks, maintenance service vans, station wagons, and tractors.

Types of public transit vehicles:

- **Sedan, Standard Van, Minivan, Conversion Van:** 7- to 15-passenger vehicles, which may or may not be wheelchair lift equipped, with useful life up to 100,000 miles and 4 years.
- **Light Duty Bus:** up to 25-passenger vehicles with useful life of 120,000 miles and 4 years.
- **Medium Duty Bus:** up to 30-passenger vehicles with useful life of 200,000 miles and 7 years.
- **Heavy Duty Bus:** up to 40-passenger vehicles with useful life of 300,000 to 350,000 miles and between 10 and 12 years.
- **Medium, Heavy Trolley:** up to 40-passenger vehicles like buses but exterior (and usually interior) designed to look like a streetcar from the early 1900s, and useful life of 13 years.

Transit agencies responded by inputting how many additional revenue vehicles are needed between the current date and 2030, and then between 2030 and 2050. As mentioned in Appendix 3 on the Transit Needs Survey, transit agencies are generally exploring the "rightsizing" of their fleet in order to have an appropriately sized vehicle for the likely number of riders. Urban systems typically focus on fixed-route service which transports larger numbers of people for shorter distances, while Regional systems generally transport fewer numbers of people over longer distances resulting in many systems transitioning toward the use of smaller vans that are more practical for maintenance and more suited for transporting fewer passenger in order to augment or replace larger buses. Figure A5.35 shows projected vehicle needs, and Figure A5.36 provides current replacement costs for each type of vehicle.

Figure A5.35: Transit vehicle existing fleet and needs for Large Urban, Small Urban, and Regional systems by vehicle type by years 2030 and 2050

	Large Urban			Small Urban			Regional			Total			
Vehicle Type	Existing	2030	2050	Existing	2030	2050	Existing	2030	2050	Existing	2030	2050	Total Add'l
Sedan	4	1	1	0	0	0	23	21	13	27	22	14	36
Minivan	32	0	0	10	11	8	127	51	64	169	62	72	134
Standard Van	81	0	0	0	0	0	11	10	15	92	10	15	25
Conversion Van	0	0	0	1	3	1	16	55	37	17	58	38	96
Light Duty Bus	93	24	27	56	12	7	659	-8	40	808	28	74	102
Medium Duty Bus	57	11	10	24	-3	4	25	29	17	106	37	31	68
Heavy Duty Bus	290	35	49	19	-1	-2	0	2	1	309	36	48	84
Medium Trolley	0	0	0	0	0	0	0	0	0	0	0	0	0
Heavy Trolley	0	0	0	1	0	0	0	0	0	1	0	0	0

Notes:
Transit Agency Needs Survey, Survey Monkey, March 2019, Question 17

Source: Iowa DOT

After gathering cost estimates for all the transit vehicles, it was necessary to apply inflation to each vehicle type for forecasting costs into the future. The Producer Price Index (PPI)[9] is a factor that can be applied to the cost estimates that can account for the change in value for costs over time and reflect this inflationary effect on the estimates. For new vehicles, PPI was gathered to reflect pricing trends for transportation equipment, specifically trucks and bus bodies between the time period of 1982 to 2019, shown in Figure A5.37. Averaging these values across a 30-year period resulted in a final PPI inflation value of 2.41 percent.

Figure A5.36: Transit vehicle replacement costs

Program Guidance
Vehicle Replacement Costs

			Exceeds Federal Threshold		Entire Fleet	
Type	**Size**	**ADA**	**Count**	**Cost**	**Count**	**Cost**
Minivan	Standard Size Vehicle	N	52	$2,015,000	82	$3,177,500
Minivan	Standard Size Vehicle	Y	90	$4,725,000	130	$6,825,000
Standard Van	Standard Size Vehicle	N	38	$1,476,300	103	$4,001,550
Conversion	138" Wheel Base	Y	0	$0	2	$109,200
Conversion	Standard Size Vehicle	N	1	$54,600	1	$54,600
Conversion	Standard Size Vehicle	Y	13	$709,800	16	$873,600
Light Duty	138" Wheel Base	Y	49	$4,136,000	74	$6,211,000
Light Duty	138" Wheel Base		0	$0	1	$69,500
Light Duty	158" Wheel Base	Y	107	$9,416,700	158	$13,793,800
Light Duty	158" Wheel Base,	Y	5	$455,500	13	$1,143,300
Light Duty	176" Wheel Base	N	2	$153,500	4	$307,000
Light Duty	176" Wheel Base	Y	378	$35,541,000	587	$54,709,500
Medium Duty	28' or Shorter	N	2	$354,900	2	$354,900
Medium Duty	28' or Shorter	Y	16	$2,916,200	43	$7,798,350
Medium Duty	32' Medium Duty	N	2	$365,600	6	$1,096,800
Medium Duty	32' Medium Duty	Y	20	$3,747,000	45	$8,359,000
Medium Duty	36' Medium Duty	N	2	$418,200	3	$627,300
Medium Duty	36' Medium Duty	Y	12	$2,572,200	16	$3,408,600
Medium Duty	40' Medium Duty	N	1	$232,200	1	$232,200
Medium Duty	40' Medium Duty	Y	1	$232,200	3	$696,600
Heavy Duty	27' Heavy Duty	Y	4	$1,597,200	4	$1,597,200
Heavy Duty	30' Heavy Duty	N	1	$451,800	1	$451,800
Heavy Duty	30' Heavy Duty	Y	15	$6,777,000	39	$17,620,200
Heavy Duty	35' Heavy Duty	N	0	$0	1	$459,200
Heavy Duty	35' Heavy Duty	Y	17	$7,806,400	85	$39,032,000
Heavy Duty	40' Heavy Duty	N	0	$0	3	$1,449,900
Heavy Duty	40' Heavy Duty	Y	115	$55,579,500	290	$140,157,000
Heavy Duty	A - Articulated	Y	6	$2,899,800	12	$5,799,600
Trolley Medium	40' Medium Duty	Y	1	$232,200	1	$232,200
Trolley Heavy	40' Heavy Duty	Y	2	$966,600	2	$966,600
Total			**952**	**$145,832,400**	**1,728**	**$321,615,000**

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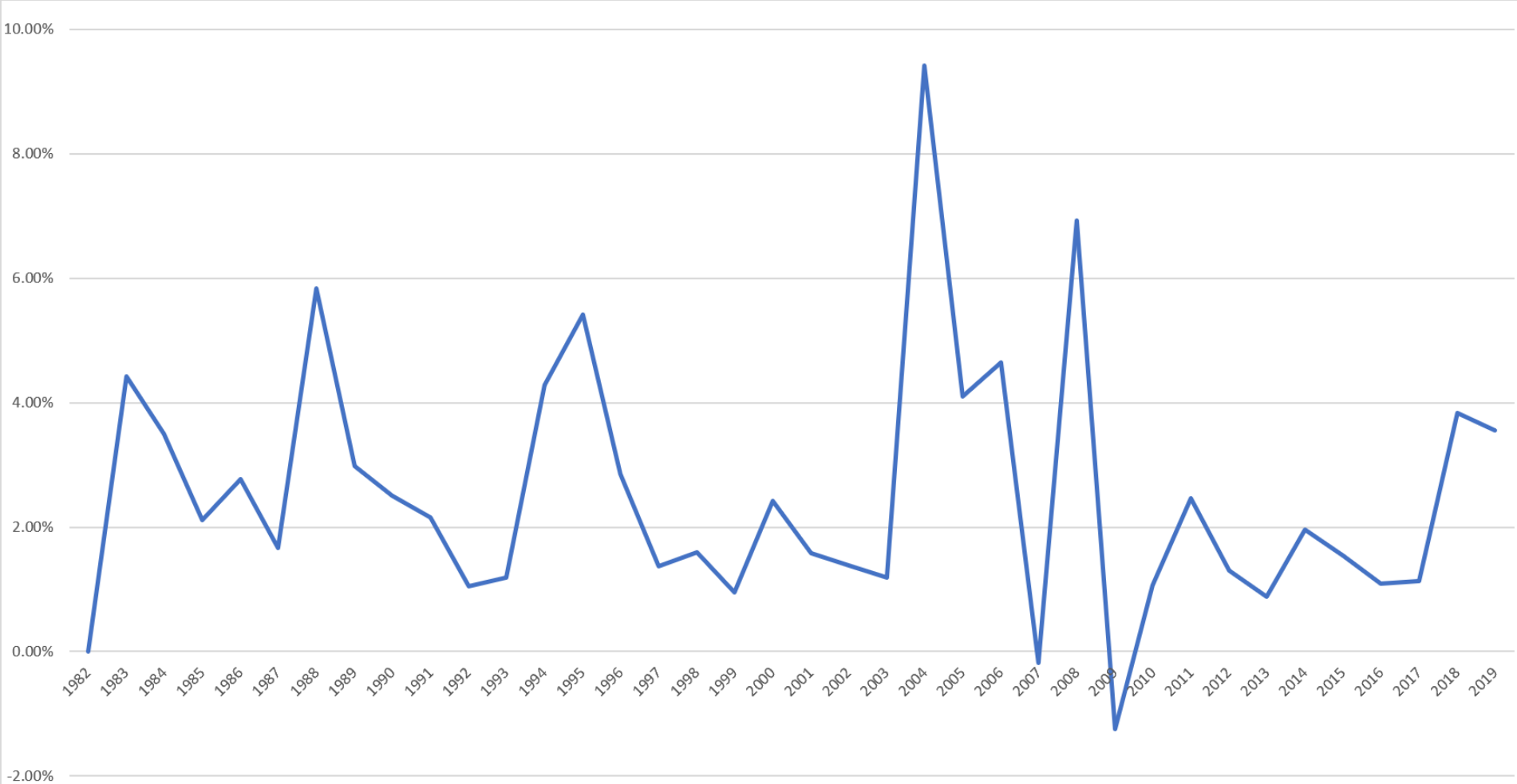
Source: Iowa DOT

[9] "Producer Price Index (PCI) by Commodity for Transportation Equipment: Truck and Bus Bodies", Federal Reserve Economic Data (FRED) Graph Observations - Economic Research Division, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org

Figure A5.37: Producer Price Index trend for transportation equipment: truck and bus bodies (1982 - 2019)



INFLATION	RATE	INFLATION	RATE
5 YR AVG:	2.23%	20 YR AVG:	2.45%
10 YR AVG:	1.88%	30 YR AVG.	2.41%

Source: Federal Reserve Bank of St. Louis - Economic Research Division

Once the quantity and types of vehicle needs were known and distributed evenly across the short-range planning horizon of 2019 through 2030 and the long-range planning horizon of 2031 through 2050, this information was entered into an analysis tool designed to optimize future investment in transit vehicles. This software, called TERM-Lite, was developed by the Federal Transit Administration (FTA) Office of Budget and Policy[10] and is designed to account for typical rehabilitation, refurbishment, or replacement timelines for vehicles, while also factoring in vehicle condition and mileage of the existing vehicle fleet.

Figure A5.38: TERM-Lite software

Sources: Federal Transit Administration, Iowa DOT

There are multiple ways of inputting the forecasted vehicle needs into TERM-Lite. The method used for this analysis used a separate spreadsheet that was supplied with the software and formatted such that when the needs were completed in the sheet, a 'Publish

[10] Federal Transit Administration, "TERM-Lite" software, https://www.transit.dot.gov/TAM/TERMLite

Inventory' button was available to automatically import the vehicle data into the TERM-Lite tool. Inputting the vehicle need data into the sheet was partially controlled through drop-down picklists for the Mode in which 'MB – Motor Bus' and 'DR – Demand Response' was utilized for all of the vehicles. The Description field was also populated using existing descriptions in the sheet. The Quantity Unit field was populated with the yearly need for that vehicle and allowed for decimal points. This allowed for the sheet to reflect the evenly divided vehicle needs that was calculated in the previous step to be directly copied into this import tool. The last piece of required information is the Year Built field which indicated the year that a new vehicle is anticipated to be purchased.

Figure A5.39: Projected transit vehicle inventory from 2019 – 2050

Publish Inventory

TERM-Lite Inventory Publisher
for the Transit Economic Requirements Model

Delete Records with no Description
Delete Selected Records
Add

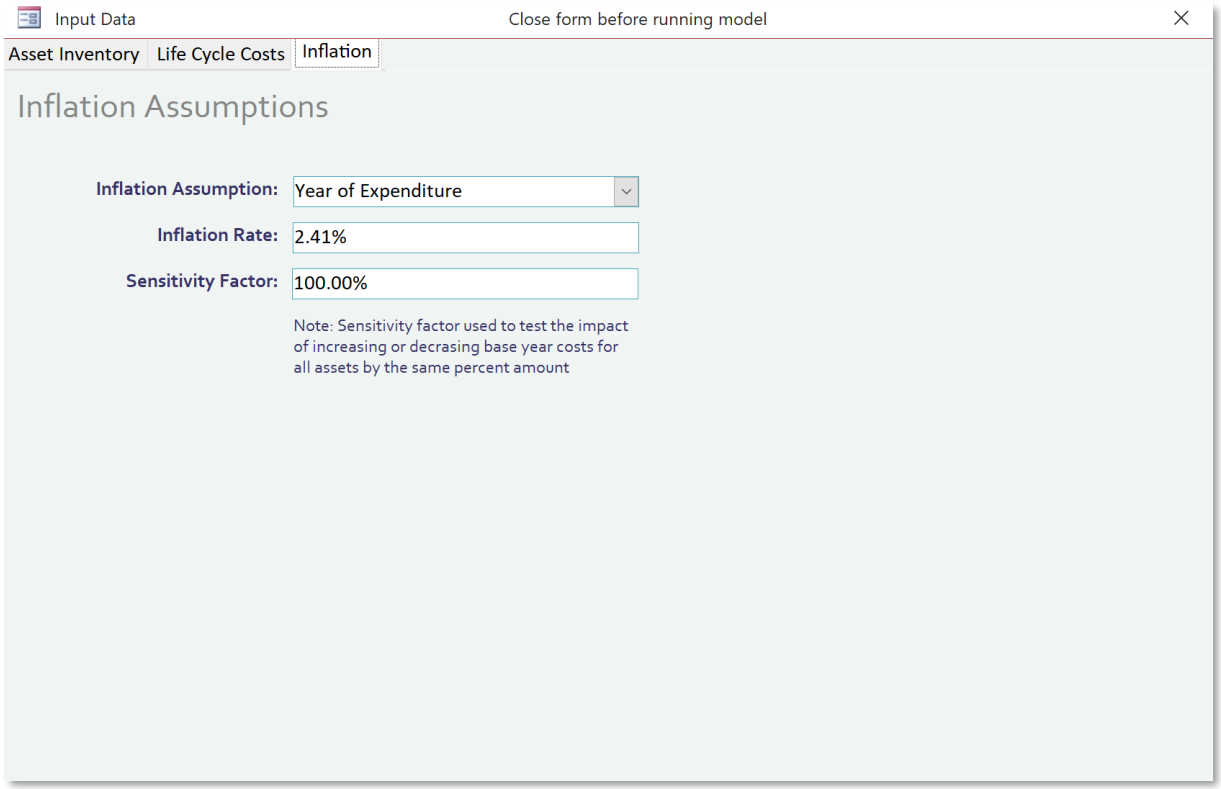
Currently, there are 2,004 records
+10 record(s)

	Record	★ (mandatory) Mode	★ Description	★ Asset Classification	★ Quantity	Unit	Expan-sion?	★ Year Built
✓	1976	MB - Motor Bus	Heavy Trolley	51000 - Vehicles, Revenue Vehicles	0.	Each	Yes	2047
✓	1977	DR - Demand Response	Standard Van	51000 - Vehicles, Revenue Vehicles	0.83	Each	Yes	2047
✓	1978	DR - Demand Response	Sedan	51000 - Vehicles, Revenue Vehicles	1.83	Each	Yes	2048
✓	1979	DR - Demand Response	Minivan	51000 - Vehicles, Revenue Vehicles	5.17	Each	Yes	2048
✓	1980	DR - Demand Response	Conversion Van	51000 - Vehicles, Revenue Vehicles	4.83	Each	Yes	2048
✓	1981	DR - Demand Response	Light Duty Bus 176	51000 - Vehicles, Revenue Vehicles	2.33	Each	Yes	2048
✓	1982	MB - Motor Bus	Medium Duty Bus 32	51000 - Vehicles, Revenue Vehicles	3.08	Each	Yes	2048
✓	1983	MB - Motor Bus	Heavy Duty Bus 40	51000 - Vehicles, Revenue Vehicles	3.	Each	Yes	2048
✓	1984	MB - Motor Bus	Medium Trolley	51000 - Vehicles, Revenue Vehicles	0.	Each	Yes	2048
✓	1985	MB - Motor Bus	Heavy Trolley	51000 - Vehicles, Revenue Vehicles	0.	Each	Yes	2048
✓	1986	DR - Demand Response	Standard Van	51000 - Vehicles, Revenue Vehicles	0.83	Each	Yes	2048
✓	1987	DR - Demand Response	Sedan	51000 - Vehicles, Revenue Vehicles	1.83	Each	Yes	2049
✓	1988	DR - Demand Response	Minivan	51000 - Vehicles, Revenue Vehicles	5.17	Each	Yes	2049
✓	1989	DR - Demand Response	Conversion Van	51000 - Vehicles, Revenue Vehicles	4.83	Each	Yes	2049
✓	1990	DR - Demand Response	Light Duty Bus 176	51000 - Vehicles, Revenue Vehicles	2.33	Each	Yes	2049
✓	1991	MB - Motor Bus	Medium Duty Bus 32	51000 - Vehicles, Revenue Vehicles	3.08	Each	Yes	2049
✓	1992	MB - Motor Bus	Heavy Duty Bus 40	51000 - Vehicles, Revenue Vehicles	3.	Each	Yes	2049
✓	1993	MB - Motor Bus	Medium Trolley	51000 - Vehicles, Revenue Vehicles	0.	Each	Yes	2049
✓	1994	MB - Motor Bus	Heavy Trolley	51000 - Vehicles, Revenue Vehicles	0.	Each	Yes	2049
✓	1995	DR - Demand Response	Standard Van	51000 - Vehicles, Revenue Vehicles	0.83	Each	Yes	2049
✓	1996	DR - Demand Response	Sedan	51000 - Vehicles, Revenue Vehicles	1.83	Each	Yes	2050
✓	1997	DR - Demand Response	Minivan	51000 - Vehicles, Revenue Vehicles	5.17	Each	Yes	2050
✓	1998	DR - Demand Response	Conversion Van	51000 - Vehicles, Revenue Vehicles	4.83	Each	Yes	2050
✓	1999	DR - Demand Response	Light Duty Bus 176	51000 - Vehicles, Revenue Vehicles	2.33	Each	Yes	2050
✓	2000	MB - Motor Bus	Medium Duty Bus 32	51000 - Vehicles, Revenue Vehicles	3.08	Each	Yes	2050
✓	2001	MB - Motor Bus	Heavy Duty Bus 40	51000 - Vehicles, Revenue Vehicles	3.	Each	Yes	2050
✓	2002	MB - Motor Bus	Medium Trolley	51000 - Vehicles, Revenue Vehicles	0.	Each	Yes	2050
✓	2003	MB - Motor Bus	Heavy Trolley	51000 - Vehicles, Revenue Vehicles	0.	Each	Yes	2050
✓	2004	DR - Demand Response	Standard Van	51000 - Vehicles, Revenue Vehicles	0.83	Each	Yes	2050

Sources: Federal Transit Administration, Iowa DOT

Once the vehicle data sheet has been imported into the TERM-Lite tool, the information can be modified by selecting the Modify Input Data button and making the appropriate changes in the Asset Inventory tab. This menu also allowed for the input of an inflation rate in the Inflation tab which adjusts the future vehicle costs for each year that is included within the analysis out to 2050. All other options were left at the default setting.

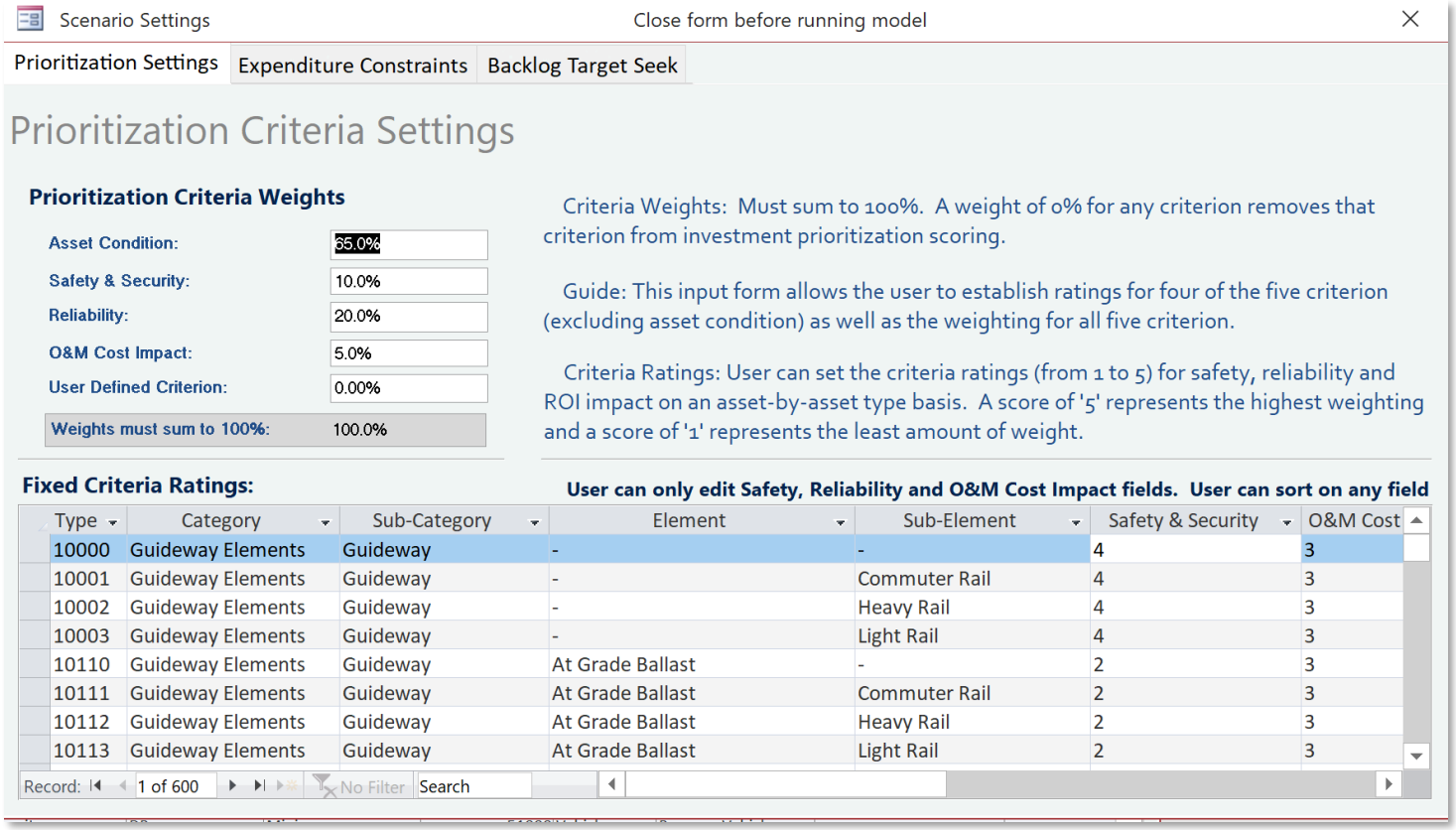
Figure A5.40: Inflation assumptions



Sources: Federal Transit Administration, Iowa DOT

The Scenario Settings button activates a menu of three tabs to further configure the TERM-Lite analysis. The first tab of Prioritization Settings affects the weighting of different characteristics of the vehicle fleet. For the purposes of this analysis, the pre-existing settings as shown in Figure A5.41 were used.

Figure A5.41: Inflation assumptions

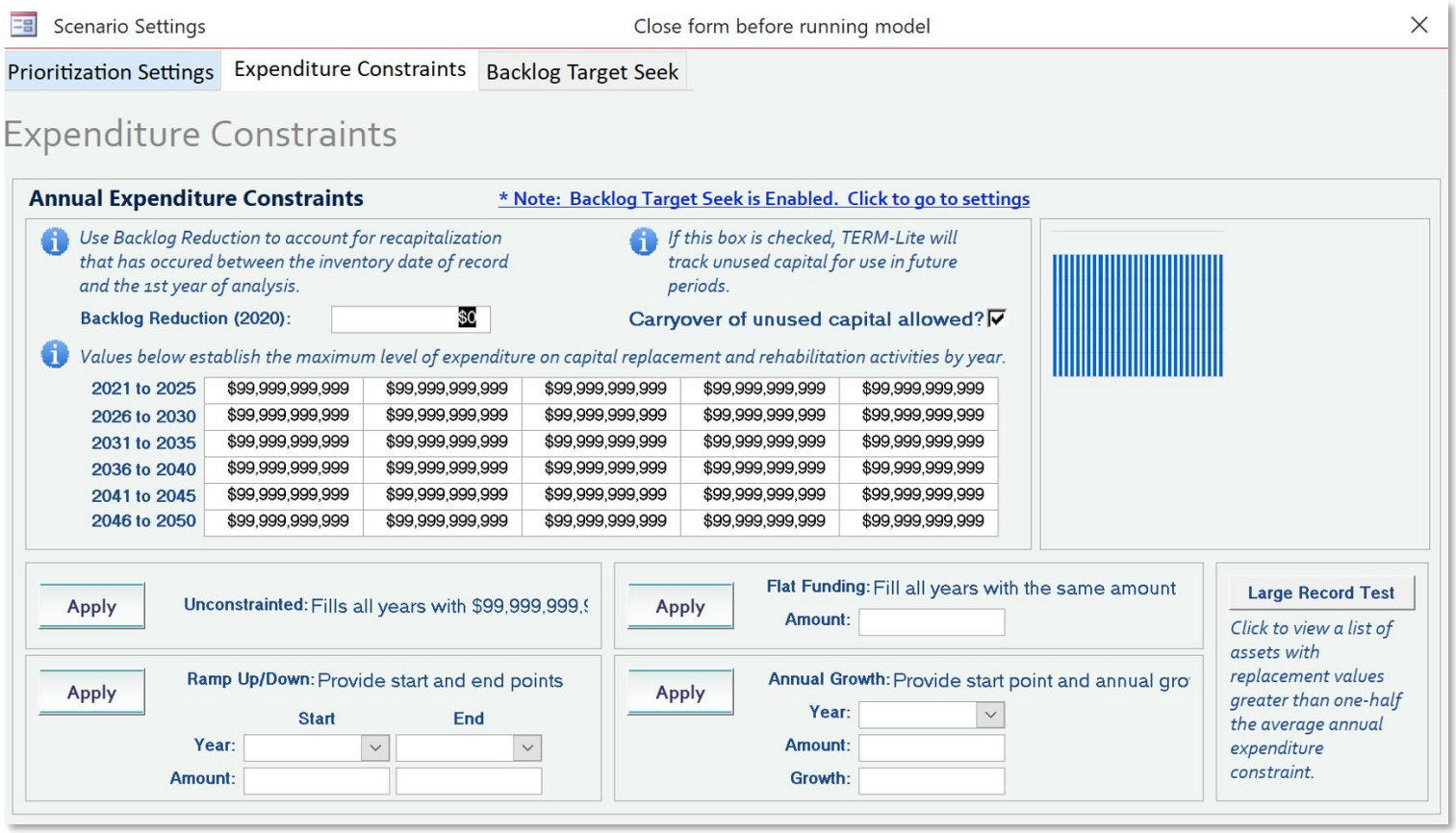


Type	Category	Sub-Category	Element	Sub-Element	Safety & Security	O&M Cost
10000	Guideway Elements	Guideway	-	-	4	3
10001	Guideway Elements	Guideway	-	Commuter Rail	4	3
10002	Guideway Elements	Guideway	-	Heavy Rail	4	3
10003	Guideway Elements	Guideway	-	Light Rail	4	3
10110	Guideway Elements	Guideway	At Grade Ballast	-	2	3
10111	Guideway Elements	Guideway	At Grade Ballast	Commuter Rail	2	3
10112	Guideway Elements	Guideway	At Grade Ballast	Heavy Rail	2	3
10113	Guideway Elements	Guideway	At Grade Ballast	Light Rail	2	3

Sources: Federal Transit Administration, Iowa DOT

The second tab under Scenario Settings allows one to adjust annual expenditures. In cases where a constrained budget for vehicle expenses is expected, a user can set what those expected budget limits will be. For the purposes of this analysis, an Unconstrained option was utilized, resulting in the year range (set in the first menu from being between 2020 and 2050 as depicted in Figure A5.42) automatically being set to $99,999,999,999. The plan development team wanted to prioritize the replacement of the vehicle fleet in order to keep the fleet in a state of good repair, essentially reducing all poor condition vehicles to 0 by no later than 2050. This allowed the group to calculate a projected budget that is required to achieve its fleet goals.

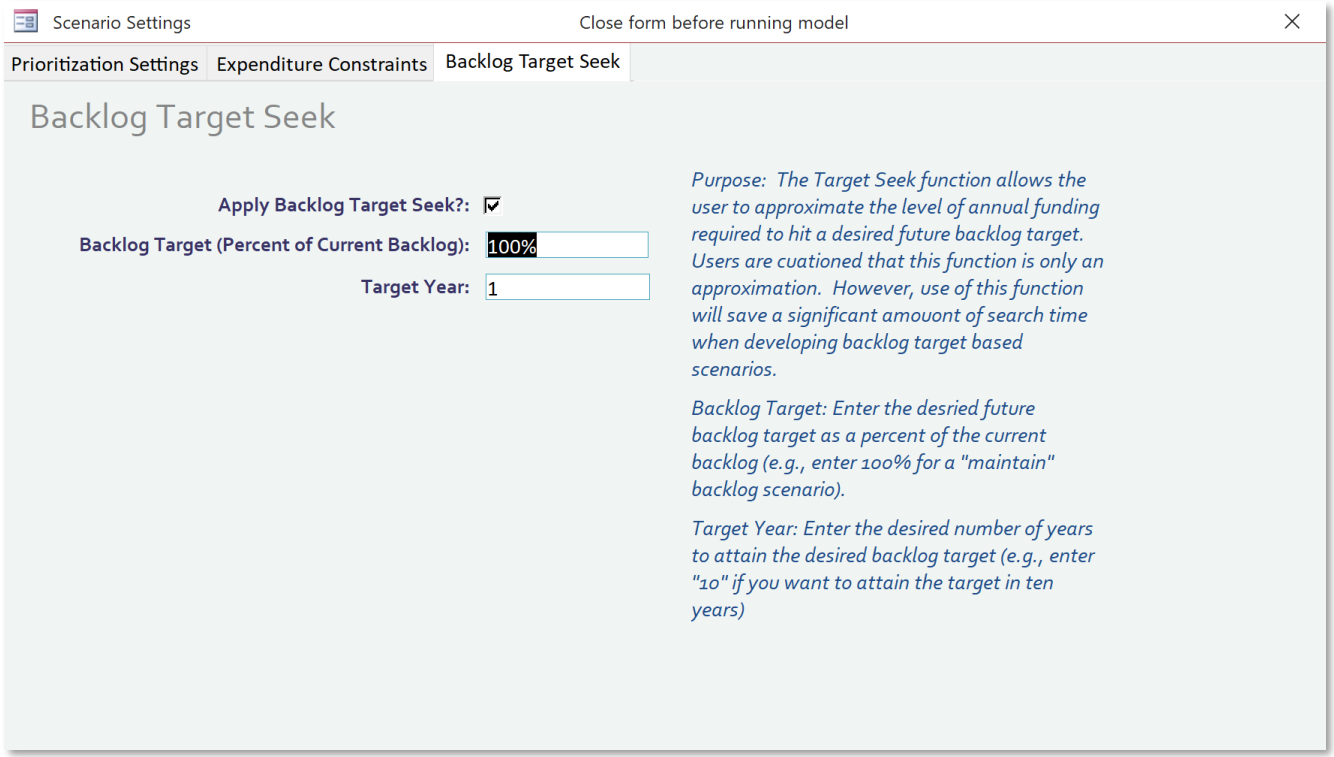
Figure A5.42: Expenditure constraints



Sources: Federal Transit Administration, Iowa DOT

The last tab of the Scenario Settings adjusts the Backlog Target Seek configurations. This affects how the current backlog of vehicle replacements will be handled in the analysis. For the purposes of this analysis, 100 percent of the backlog was considered and a target year of 1 was set in order to understand what it would take for the state to "catch up" on the backlog while being able to visualize the effects of the expansion vehicles (additional revenue vehicle needs identified in the 2019 Transit Needs Survey) on the future budget to include refurbishment and eventual replacement of those additional vehicles.

Figure A5.43: Backlog settings



Sources: Federal Transit Administration, Iowa DOT

Selecting 'Run Model' will perform the analysis and provide results in an Excel spreadsheet that contains several tabs of information. Primarily, the annual forecasted expenditures to cover the backlog of vehicles in need of replacement, in addition to acquisition, rehab, and replacement of the existing fleet was sought in order to refine the future anticipated costs for the transit plan financial analysis. These results can be seen below in Figure A5.44 and graphically depicted in Figure A5.45.

Note that additional vehicle needs identified by transit agencies in the 2019 Transit Needs Survey are represented as expansion vehicles. Since these are considered new vehicles, it will take several years before some of them begin to reach their end of expected life and require replacement.

Figure A5.44: Forecasted transit vehicle costs (2019 – 2050)

Transit vehicle costs by year (2019 - 2030)

	1	2	3	4	5	6	7	8	9	10	11	12
Asset Type	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Existing Rehab & Replace	$6,533,135	$128,060,000	$24,660,000	$53,750,000	$46,420,000	$42,530,000	$22,860,000	$48,300,000	$31,760,000	$42,540,000	$60,080,000	$14,210,000
Expansion Acquisition	$0	$0	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000
Expansion Rehab & Replace	$0	$0	$0	$0	$0	$0	$720,000	$990,000	$990,000	$1,700,000	$2,420,000	$0
Total	**$6,533,135**	**$128,060,000**	**$28,200,000**	**$57,290,000**	**$49,960,000**	**$46,070,000**	**$27,120,000**	**$52,830,000**	**$36,290,000**	**$47,780,000**	**$66,040,000**	**$17,750,000**

Transit vehicle costs by year (2031 - 2040)

	13	14	15	16	17	18	19	20	21	22
Asset Type	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Existing Rehab & Replace	$48,870,000	$33,460,000	$16,440,000	$56,560,000	$46,010,000	$30,750,000	$28,210,000	$55,470,000	$19,910,000	$47,990,000
Expansion Acquisition	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000
Expansion Rehab & Replace	$4,390,000	$720,000	$1,980,000	$4,170,000	$5,610,000	$10,830,000	$5,360,000	$3,430,000	$5,270,000	$11,020,000
Total	**$56,800,000**	**$37,720,000**	**$21,960,000**	**$64,270,000**	**$55,160,000**	**$45,120,000**	**$37,110,000**	**$62,440,000**	**$28,720,000**	**$62,550,000**

Transit vehicle costs by year (2041 - 2050)

	23	24	25	26	27	28	29	30	31	32
Asset Type	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Existing Rehab & Replace	$42,730,000	$35,870,000	$48,550,000	$39,910,000	$30,720,000	$37,580,000	$53,180,000	$37,950,000	$41,760,000	$55,180,000
Expansion Acquisition	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000	$3,540,000
Expansion Rehab & Replace	$8,900,000	$7,150,000	$8,230,000	$7,570,000	$3,340,000	$14,950,000	$17,210,000	$12,700,000	$7,570,000	$27,460,000
Total	**$55,170,000**	**$46,560,000**	**$60,320,000**	**$51,020,000**	**$37,600,000**	**$56,070,000**	**$73,930,000**	**$54,190,000**	**$52,870,000**	**$86,180,000**

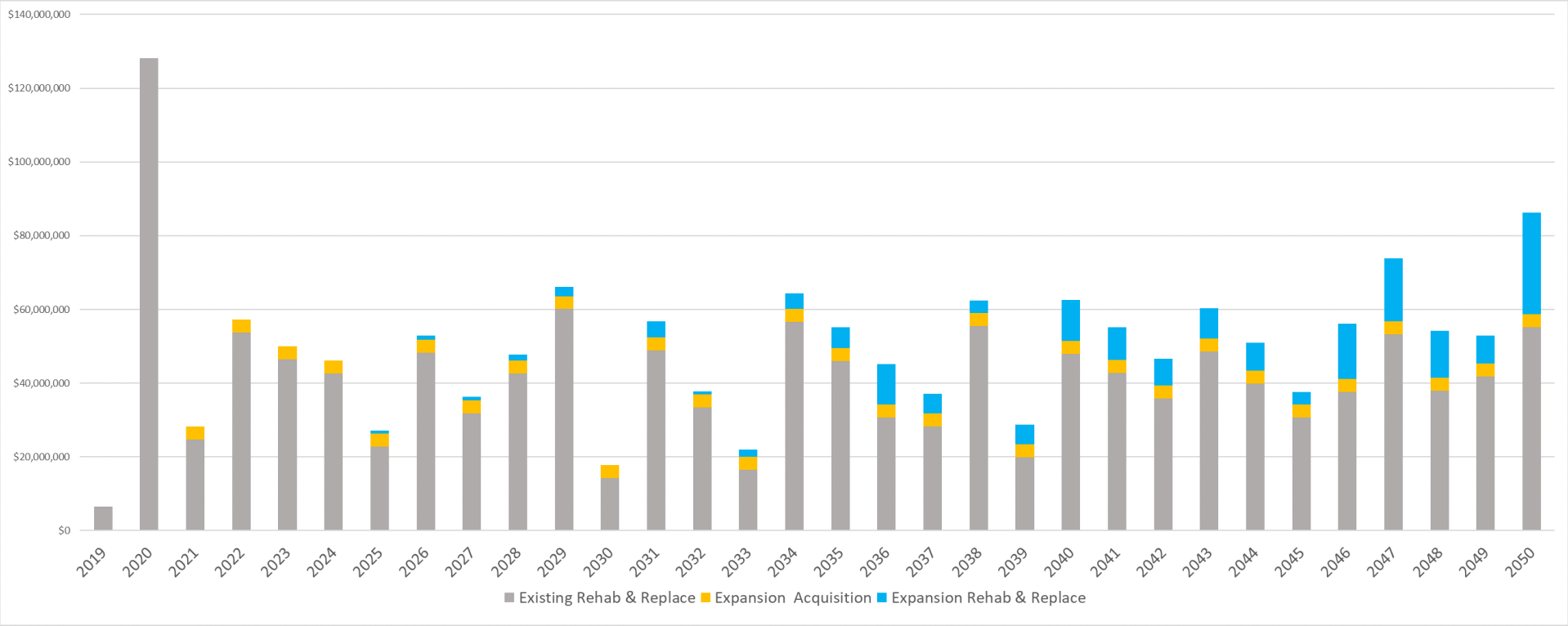
Source: Iowa DOT

As mentioned above, the chart in Figure A5.45 graphically depicts the tabular vehicles costs depicted in Figure A5.44. Gray shaded bars represent the existing vehicle fleet for all transit agencies as of 2019. Orange shaded bars represent the acquisition or purchase of new transit vehicles that were identified as needs in the 2019 Transit Needs Survey. Blue shaded bars represent the refurbishment and replacement of those new acquisition transit vehicles represented in the orange bars. The expected lifespans for the different types of transit vehicles differ from each other based on the number of miles that is expected of that type of vehicle or the expected durability of the vehicle itself, resulting in more or less rehab and replacements in the future.

In addition to the projected costs of maintaining or acquiring transit vehicles in the future, TERM-Lite is also able to depict the relative condition of the vehicle fleet based on the expected lifespan and mileage of those vehicles. The existing vehicle fleet with (constrained) baseline funding levels was run initially to establish a baseline understanding of what the transit fleet will look like if nothing was changed as far as new vehicles acquired or funding levels adjusted. Figure A5.46 shows that the red shaded 'Poor' condition vehicles will encompass approximately 80 percent of the entire transit fleet by around the year 2035, plateauing at that level/ for the foreseeable future and leaving only 10 percent of the fleet in 'Marginal' condition as amber and 10 percent as 'Good' condition in green.

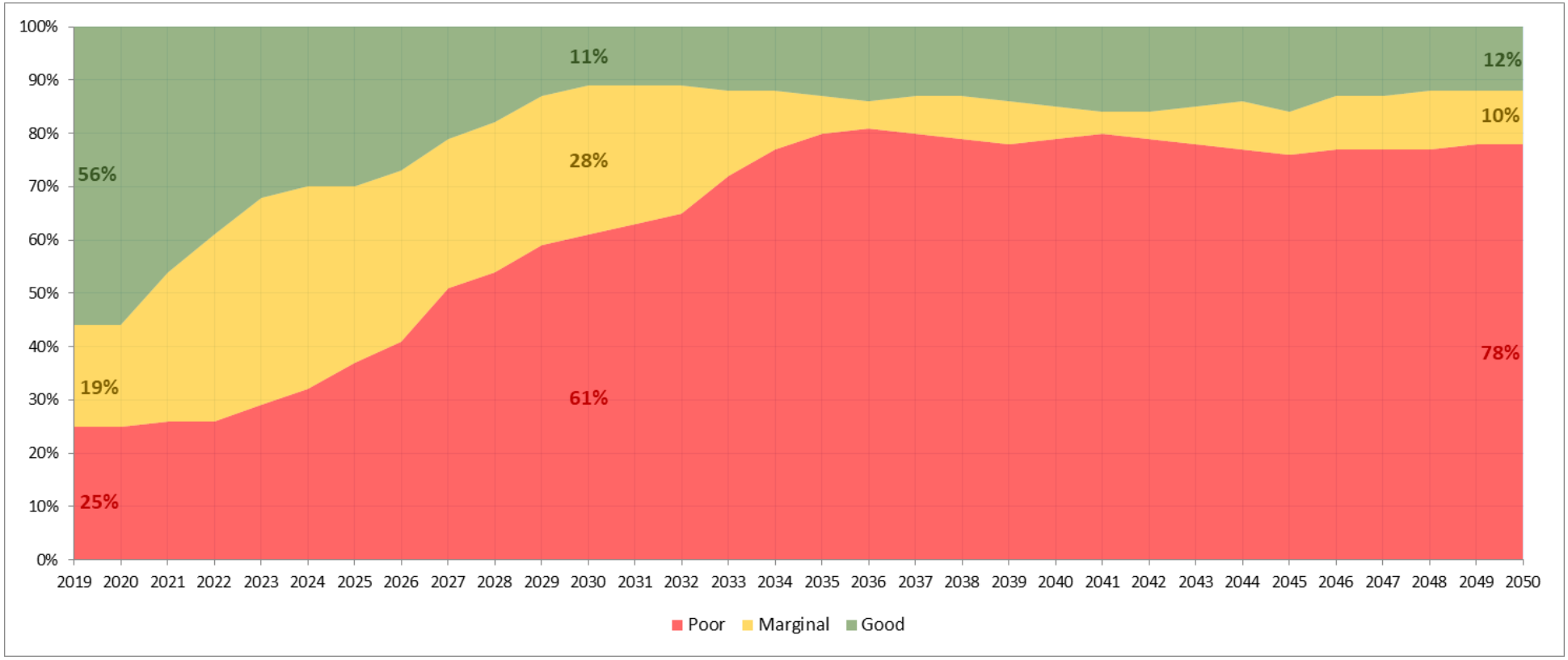
After running the analysis as part of this planning effort, unconstrained funding was included as described in the Scenario Settings above which included backlog and expansion vehicles. The results shown in Figure A5.47 reflect the overall goal of reducing the vehicle fleet 'Poor' condition vehicles to 0 percent by the end of the long-term planning horizon of 2050 resulting in roughly two-thirds of fleet in 'Good' condition and one-third in 'Marginal' condition. These graphical products can also be utilized to gauge the impact of the transit fleet budget during the implementation of this plan in order to determine the effect that fleet-related strategies have on their conditions.

Figure A5.45: Forecasted transit vehicle costs (2019 – 2050)



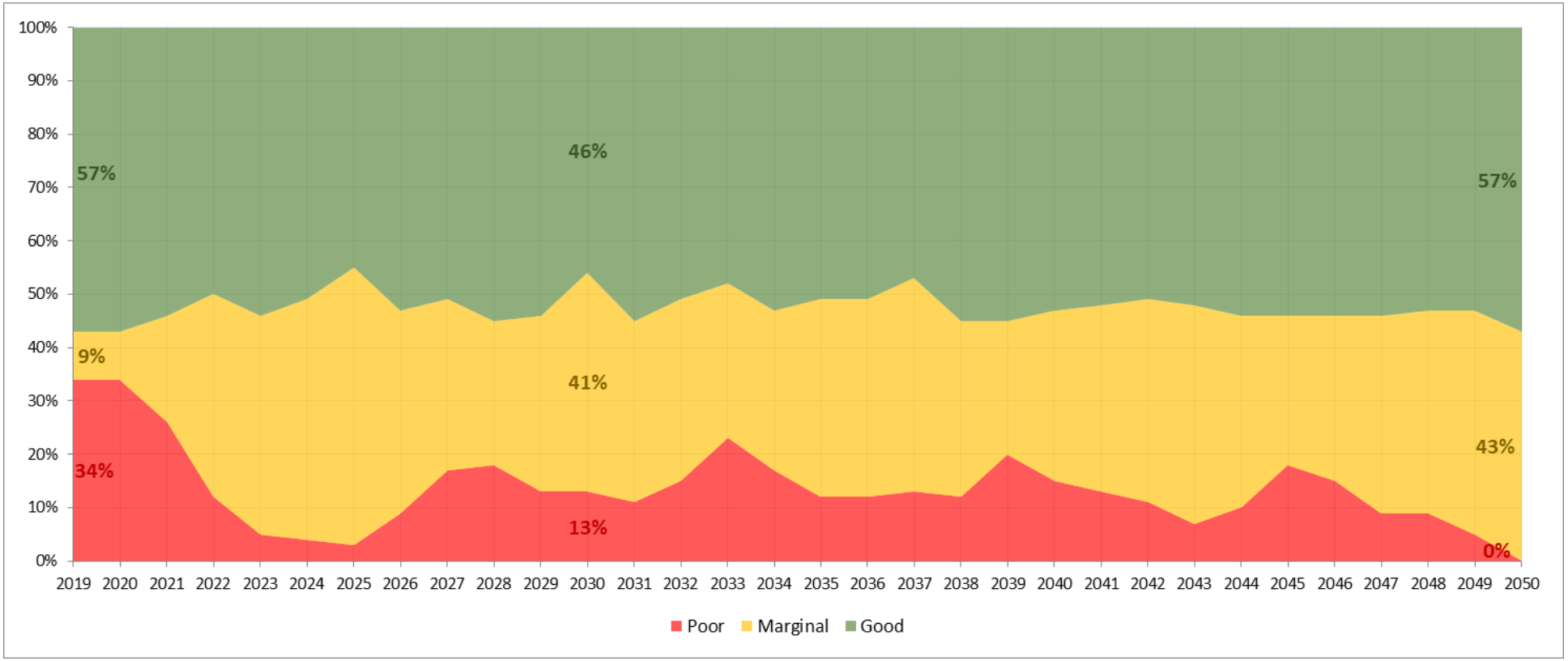
Source: Iowa DOT

Figure A5.46: Transit vehicle fleet condition forecast by year with constrained funding (2019 - 2050)



Source: Iowa DOT

Figure A5.47: Transit vehicle fleet condition forecast by year with unconstrained funding (2019 - 2050)



Source: Iowa DOT

Projected Shortfall

Having determined future costs in terms of operating and capital expenses as well as anticipating possible revenues allows for these to be combined in order to identify financial gaps were costs will exceed expected revenue. These gaps represent shortfalls in transit funding that will need to be addressed in order to support the operating and capital investments that have been identified as priorities.

As described earlier, there were two separate and distinct capital funding scenarios, one representing typical funding levels and a second representing higher than normal funding levels reflecting recent increases as well as including competitive and discretionary funding. For determining shortfalls, these two funding scenarios were carried through, resulting in shortfalls being calculated for both scenarios.

Figure A5.48 depicts the table of operating and capital costs with anticipating funding from 2019 through 2050 with shortfalls for each funding scenario. The orange 'Projected Costs' summarize the operating and capital expenditures described earlier in this document and aggregated as 'Total Expenses.' The green 'Projected Revenue' was likewise summarized from the earlier section in this document by capturing the anticipated operating funding in addition to the two capital funding scenarios, resulting in two separate total revenue values. Finally, the 'Total Expenses' were subtracted from the 'Total Revenue' in both scenarios, resulting in the total shortfalls or gaps in revenue as depicted under the red 'Projected Shortfall.' All values depicted in Figure A5.48 are in millions of dollars, for example, the total shortfall for scenario one in the year 2030 is 44.388731 which is approximately $44,388,731,000.

As shown in Figure A5.48, total future costs exceed available revenues in both funding scenarios.

Figure A5.48: Forecasted costs and funding scenarios (2019 - 2050)

# years	1	2	3	4	5	6	7	8	9	10	11	12
PROJECTED COSTS	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total operating	$147,851,345	$155,742,185	$163,677,570	$171,657,498	$179,681,970	$187,750,986	$195,864,546	$204,022,650	$212,225,298	$220,472,489	$228,764,225	$237,100,504
Total capital	$18,058,581	$139,812,871	$40,180,295	$69,497,719	$62,395,144	$58,732,568	$40,009,993	$65,947,417	$49,634,841	$61,352,266	$79,839,690	$31,777,115
TOTAL COSTS	**$165,909,926**	**$295,555,056**	**$203,857,865**	**$241,155,217**	**$242,077,114**	**$246,483,554**	**$235,874,539**	**$269,970,067**	**$261,860,139**	**$281,824,755**	**$308,603,915**	**$268,877,619**
PROJECTED REVENUE												
Total operating	$141,650,647	$148,331,644	$155,012,642	$161,693,640	$168,374,637	$175,055,635	$181,736,632	$188,417,630	$195,098,628	$201,779,625	$208,460,623	$215,141,621
Scenario 1. Typical capital funding	$6,533,135	$6,788,965	$7,044,795	$7,300,625	$7,556,456	$7,812,286	$8,068,116	$8,323,946	$8,579,776	$8,835,607	$9,091,437	$9,347,267
Scenario 2. Increased capital funding	$14,887,574	$15,277,682	$15,667,790	$16,057,898	$16,448,006	$16,838,114	$17,228,222	$17,618,329	$18,008,437	$18,398,545	$18,788,653	$19,178,761
Scenario 1. TOTAL REVENUE	**$148,183,781**	**$155,120,609**	**$162,057,437**	**$168,994,265**	**$175,931,093**	**$182,867,921**	**$189,804,748**	**$196,741,576**	**$203,678,404**	**$210,615,232**	**$217,552,060**	**$224,488,888**
Scenario 2. TOTAL REVENUE	**$156,538,221**	**$163,609,326**	**$170,680,432**	**$177,751,537**	**$184,822,643**	**$191,893,748**	**$198,964,854**	**$206,035,959**	**$213,107,065**	**$220,178,170**	**$227,249,276**	**$234,320,382**
PROJECTED SHORTFALL												
Scenario 1. TOTAL SHORTFALL	**$17,726,145**	**$140,434,447**	**$41,800,428**	**$72,160,952**	**$66,146,021**	**$63,615,634**	**$46,069,790**	**$73,228,491**	**$58,181,735**	**$71,209,523**	**$91,051,855**	**$44,388,731**
Scenario 2. TOTAL SHORTFALL	**$9,371,705**	**$131,945,730**	**$33,177,433**	**$63,403,680**	**$57,254,471**	**$54,589,806**	**$36,909,685**	**$63,934,107**	**$48,753,074**	**$61,646,585**	**$81,354,639**	**$34,557,237**

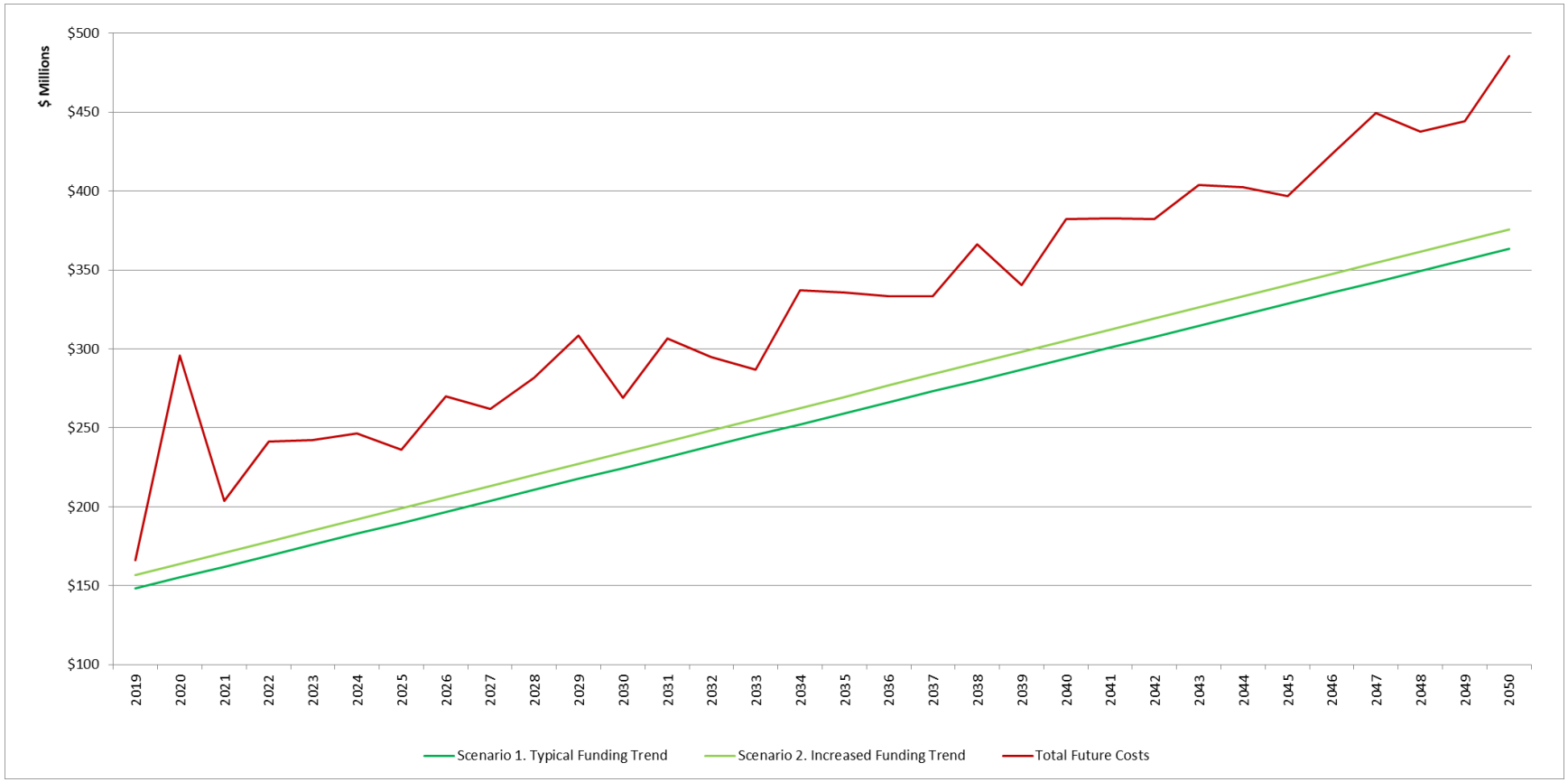
# years	13	14	15	16	17	18	19	20	21	22
PROJECTED COSTS	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Total operating	$244,719,469	$252,357,350	$260,014,147	$267,689,859	$275,384,487	$283,098,030	$290,830,489	$298,581,864	$306,352,154	$314,141,360
Total capital	$61,700,813	$42,699,107	$27,017,400	$69,405,694	$60,373,988	$50,412,282	$42,480,575	$67,888,869	$34,247,163	$68,155,457
TOTAL COSTS	**$306,420,282**	**$295,056,457**	**$287,031,547**	**$337,095,553**	**$335,758,475**	**$333,510,312**	**$333,311,065**	**$366,470,733**	**$340,599,317**	**$382,296,817**
PROJECTED REVENUE										
Total operating	$221,822,618	$228,503,616	$235,184,613	$241,865,611	$248,546,609	$255,227,606	$261,908,604	$268,589,602	$275,270,599	$281,951,597
Scenario 1. Typical capital funding	$9,603,097	$9,858,927	$10,114,758	$10,370,588	$10,626,418	$10,882,248	$11,138,078	$11,393,909	$11,649,739	$11,905,569
Scenario 2. Increased capital funding	$19,568,869	$19,958,977	$20,349,085	$20,739,193	$21,129,301	$21,519,408	$21,909,516	$22,299,624	$22,689,732	$23,079,840
Scenario 1. TOTAL REVENUE	**$231,425,715**	**$238,362,543**	**$245,299,371**	**$252,236,199**	**$259,173,027**	**$266,109,854**	**$273,046,682**	**$279,983,510**	**$286,920,338**	**$293,857,166**
Scenario 2. TOTAL REVENUE	**$241,391,487**	**$248,462,593**	**$255,533,698**	**$262,604,804**	**$269,675,909**	**$276,747,015**	**$283,818,120**	**$290,889,226**	**$297,960,331**	**$305,031,437**
PROJECTED SHORTFALL										
Scenario 1. TOTAL SHORTFALL	**$74,994,567**	**$56,693,914**	**$41,732,176**	**$84,859,354**	**$76,585,448**	**$67,400,457**	**$60,264,382**	**$86,487,223**	**$53,678,979**	**$88,439,651**
Scenario 2. TOTAL SHORTFALL	**$65,028,795**	**$46,593,864**	**$31,497,849**	**$74,490,749**	**$66,082,565**	**$56,763,297**	**$49,492,944**	**$75,581,507**	**$42,638,986**	**$77,265,380**

# years	23	24	25	26	27	28	29	30	31	32
PROJECTED COSTS	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Total operating	$321,949,482	$329,776,519	$337,622,472	$345,487,341	$353,371,125	$361,273,825	$369,195,440	$377,135,971	$385,095,418	$393,073,780
Total capital	$60,853,750	$52,322,044	$66,160,338	$56,938,632	$43,596,925	$62,145,219	$80,083,513	$60,421,806	$59,180,100	$92,568,394
TOTAL COSTS	**$382,803,232**	**$382,098,563**	**$403,782,810**	**$402,425,972**	**$396,968,050**	**$423,419,044**	**$449,278,953**	**$437,557,778**	**$444,275,518**	**$485,642,174**
PROJECTED REVENUE										
Total operating	$288,632,594	$295,313,592	$301,994,590	$308,675,587	$315,356,585	$322,037,583	$328,718,580	$335,399,578	$342,080,575	$348,761,573
Scenario 1. Typical capital funding	$12,161,399	$12,417,229	$12,673,060	$12,928,890	$13,184,720	$13,440,550	$13,696,380	$13,952,211	$14,208,041	$14,463,871
Scenario 2. Increased capital funding	$23,469,948	$23,860,056	$24,250,164	$24,640,272	$25,030,380	$25,420,487	$25,810,595	$26,200,703	$26,590,811	$26,980,919
Scenario 1. TOTAL REVENUE	**$300,793,994**	**$307,730,821**	**$314,667,649**	**$321,604,477**	**$328,541,305**	**$335,478,133**	**$342,414,961**	**$349,351,788**	**$356,288,616**	**$363,225,444**
Scenario 2. TOTAL REVENUE	**$312,102,542**	**$319,173,648**	**$326,244,753**	**$333,315,859**	**$340,386,964**	**$347,458,070**	**$354,529,175**	**$361,600,281**	**$368,671,386**	**$375,742,492**
PROJECTED SHORTFALL										
Scenario 1. TOTAL SHORTFALL	**$82,009,239**	**$74,367,742**	**$89,115,161**	**$80,821,495**	**$68,426,745**	**$87,940,911**	**$106,863,992**	**$88,205,989**	**$87,986,902**	**$122,416,730**
Scenario 2. TOTAL SHORTFALL	**$70,700,690**	**$62,924,915**	**$77,538,057**	**$69,110,113**	**$56,581,086**	**$75,960,974**	**$94,749,777**	**$75,957,497**	**$75,604,132**	**$109,899,682**

Source: Iowa DOT

The values in Figure A5.48 were also depicted as a stacked line chart in Figure A5.49. The two green lines indicate the two funding scenarios with the red line indicating total future costs. As noted above, total future costs exceed available revenues in both funding scenarios. The spike in costs near year 2020 reflects the backlog of vehicles while the ups and downs throughout most of the remainder of the period through 2050 represent a combination of differing vehicle replacement rates since vans and buses age differently, as well as differing personnel and facility expansion needs each year.

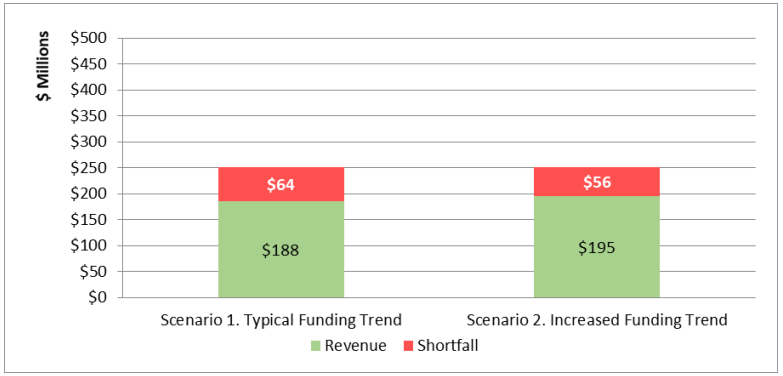
Figure A5.49: Forecasted costs and funding scenarios (2019 - 2050)



Source: Iowa DOT

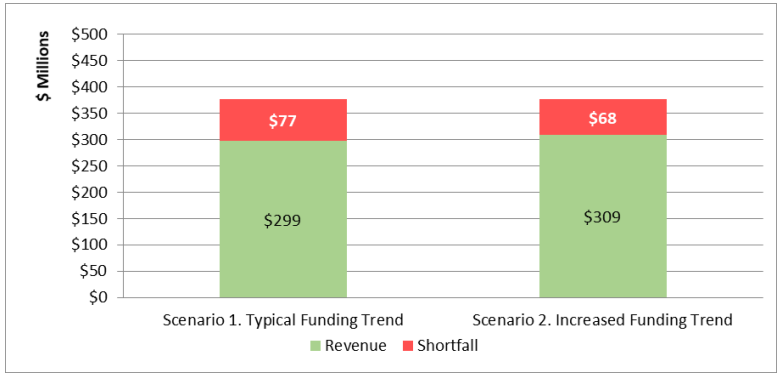
Figures A5.50 and A5.51 represent the average annual funding shortfalls expected to occur by the short-range and long-range planning horizons. Regardless of the funding scenario, these shortfalls are expected to increase as time goes on. Between 2019 and 2030, the optimistic increased funding estimate leaves an average shortfall of $56 million, while the conservative estimate of typical funding leaves a shortfall of $64 million. By 2050, these annual shortfalls will increase to $68 million and $77 million, respectively.

Figure A5.50: Forecasted average annual funding shortfall (2019 - 2030)



Source: Iowa DOT

Figure A5.51: Forecasted average annual funding shortfall (2031 - 2050)



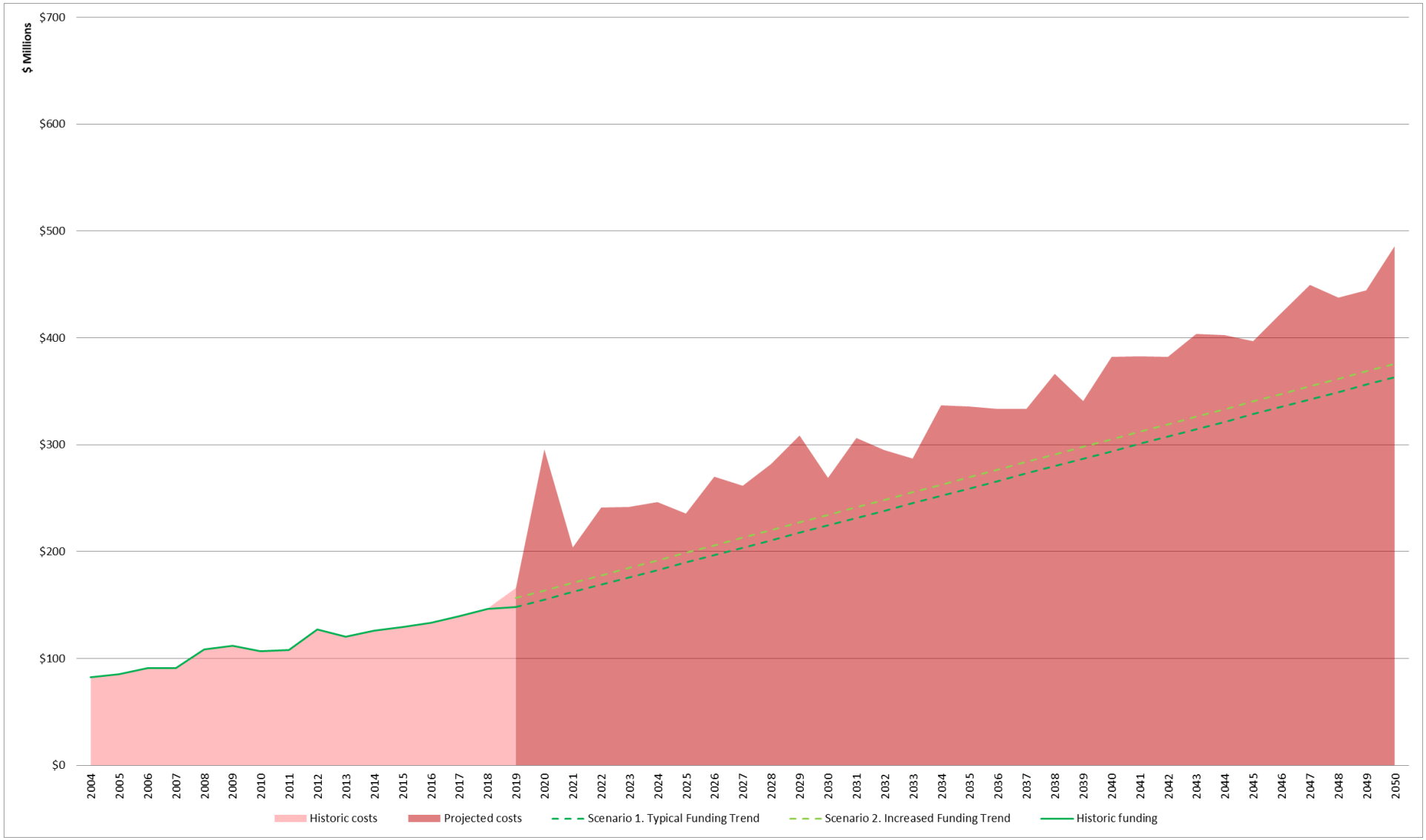
Source: Iowa DOT

Figure A5.52 reflects the same forecasted costs and funding scenarios but also adds historical values as well, in order to graphically depict the overall trend that this financial analysis attempted to convey. The overall takeaway from this analysis was more than simply understanding previous, current, and anticipated financial challenges. By understanding what the needs are for the public transit system to maintain a sustainable public transportation system, we can identify and mitigate these shortfalls. The funding mechanisms described in the Plan and in further detail in Appendix 6 outline some possible ways in which the gaps in funding can be addressed.

Implications of the shortfall:

- **Deprioritized facilities:** Expanding storage facilities will decrease overall operational costs of maintaining vehicles over time. However, the number of vehicles beyond useful life right now may result in vehicles being prioritized over facilities.
- **Deferred maintenance:** Impacts to operational funding may affect facilities or vehicles in terms of deferred maintenance and the hiring or retention of personnel.
- **Decreased staff:** Decreasing staff levels as a cost saving measure, particularly drivers, will result in a decrease to overall transit service, further limiting farebox revenue and additional sources of funding.
- **Unsustainable investment:** If shortfalls in transit funding are not addressed, priority operating and capital investments cannot be supported.

Figure A5.52: Historical and forecasted costs with funding scenarios (2004 - 2050)



Source: Iowa DOT

www.iowadot.gov