# City of Madison

DEPARTMENT OF


TRANSPORTATION

# Metro Facility Analysis

January 30, 2019

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Page No.
or Following

Executive Summary

ES.1 Introduction ..... ES-1
ES.2 Alternative Sites ..... ES-1
ES.3 Scenarios ..... ES-3
ES.4 Evaluation Criteria and Analysis ..... ES-4
ES.5 Critical Needs ..... ES-4
ES.6 Other Needs ..... ES-4
ES.7 Desires ..... ES-7
ES.8 Summary of Scenario Evaluation ..... ES-8
ES.9 Observations and Recommendations ..... ES-9

Section 1 – Introduction

1.0 Introduction ..... 1-1
1.1 Critical Needs ..... 1-1
1.2 Other Needs ..... 1-2
1.3 Desires ..... 1-3

Section 2 – Alternative Sites and Scenarios

2.0 Introduction ..... 2-1
2.1 Alternative Sites ..... 2-1
2.2 Scenarios ..... 2-3

Section 3 – Deadhead Analysis

3.0 Introduction ..... 3-1
3.1 Alternatives and Scenarios ..... 3-1
3.2 Results and Conclusions ..... 3-1
3.3 Analysis Details and Assumptions ..... 3-2

Section 4 – Net Present Value

4.0 Introduction ..... 4-1
4.1 Satellite Facility Analysis of Net Present Value ..... 4-1
4.2 Discount Rate and Inflation ..... 4-1

Section 5 – Facility Costs

5.0 Introduction ..... 5-1
5.1 1101 East Washington Ave Costs ..... 5-1
5.2 Highway 30 Costs (Generic) ..... 5-2
5.3 Nakoosa Satellite Facility ..... 5-5
5.4 East and West Satellite Facility ..... 5-6

Section 6 – Evaluation and Recommendation

6.0 Evaluation Summary ..... 5-1
6.1 Recommendation ..... 6-1

## Table of Contents Continued


Page No.
or Following

### *Tables*

| | | |
|---|---|---|
| ES.6-1 | Net Present Value Summary | ES-6 |
| ES.6-2 | Net Present Values of Scenarios | ES-6 |
| ES.8-1 | Summary of Scenario Evaluation | ES-8 |
| 3.2-1 | Deadhead Analysis Results | 3-2 |
| 4.2-1 | Net Present Value Analysis Summary | 4-3 |
| 4.2-2 | Net Present Value of Scenario Costs | 4-4 |
| 5.1-1 | 1101 East Washington Ave Facility Costs | 5-2 |
| 5.4-1 | West and East Satellite Facility Costs | 5-6 |
| 6.0-1 | Scenario Matrix | 6-2 |

### *Figures*

| | | |
|---|---|---|
| ES.2-1 | Location of Oscar Mayer Site | ES-2 |
| ES.2-2 | Nakoosa Trail Site Plan | ES-3 |
| ES.3-1 | Scenarios | ES-4 |
| ES.6-1 | Potential Offsetting Costs | ES-7 |
| 2.1-1 | Existing 1101 East Washington Ave Facility | 2-1 |
| 2.1-2 | General Location of the Highway 30 Site | 2-2 |
| 2.1-3 | Location of Oscar Mayer Site | 2-2 |
| 2.1-3 | Nakoosa Trail Site Plan | 2-3 |
| 2.2-1 | Scenarios | 2-4 |
| 3.1-1 | Facility Scenarios | 3-1 |
| 5.1-1 | 1101 East Washington Ave Phasing Plan | 5-1 |
| 5.2-1 | Highway 30 Facility Cost Estimate | 5-4 |
| 5.3-1 | Nakoosa Trail Satellite Facility Cost Estimate | 5-5 |

# Executive Summary

## ES.1 Introduction

Several major infrastructure decisions that have implications for the next 30 years lie before Metro Transit. Portions of their current bus storage facility are over 100 years old, the facility is storing 30 percent more buses than it was designed for, and there are health and safety needs. It has been almost 40 years since the building received a major infrastructure upgrade. Metro bus service is at capacity and Metro cannot respond to requests for additional peak period service because they do not have the rolling stock to respond to those needs – a consequence of the limitations of the current bus storage facility.

Proposals and site-specific studies have been performed over the past 14 years to address components of this problem. Some of the recommendations from these reports are currently being implemented (improvements to the 1101 East Washington Ave facility), while others have been dismissed because of high infrastructure costs (Nakoosa satellite facility and expansion at the existing facility).

This report studies both alternative sites, and courses of action (scenarios) that would provide a template for Metro infrastructure investment over the next two decades. Scenarios represent not just projects, but a sequence and timing of actions that meet Metro's needs until 2050. This report evaluates the scenarios using criteria based on service needs and infrastructure desires. There are three criteria groupings used to evaluate facility scenarios. They include:

- Critical needs – needs that every scenario addresses. They include:
    - Improving safety, both driver and environmental.
    - Accommodating Bus Rapid Transit Vehicles
    - Accommodating Electric Vehicles
    - Providing more bus storage.
- Other needs – needs that are addressed to different degrees between the scenarios. They include:
    - Financial feasibility, both in Capital Improvement Program costs as well as debt service.
    - Cost Effectiveness, both in Net Present Value (NPV) of the costs of bus operating costs (time spent traveling without passengers.)
- Desires – characteristics that would be beneficial for metro, but not essential. They include:
    - Ability to satisfy the Federal Transit Authority local match requirements for Bus Rapid Transit.
    - Preserve the ability to fully relocate Metro facilities from the 1101 East Washington Ave facility.
    - Having control of the property at the end of the analysis period, eliminating being subject to rent renegotiation or possible removal.
- Intangibles – characteristics that are difficult to quantify and monetize. These could include:
    - Factors that could impede implementation, such as not having an available site identified.

## ES.2 Alternative Sites

Several sites have been identified as being potential hosts for either Metro's main center of operations, or as a satellite bus facility. The following paragraphs summarize alternative sites.

- 1101 East Washington Avenue – Primary Site

Metro's current single bus facility at 1101 East Washington Avenue is relatively central to Madison and Metro's service area. It holds 215 standard 40-foot buses on about 10 acres (including parking and administration). The facility cannot accommodate additional buses needed for service expansion.

- Highway 30 Site – Primary or Satellite Site – Madison enlisted the services of Mead & Hunt and Kueny Architects LLC to prepare a generic site design and cost estimate for programming purposes to evaluate the cost effectiveness of constructing a new facility versus purchasing and repurposing an already constructed facility. The generic site is referred to being located near Highway 30 and Packers Avenue, a location relatively efficient for Metro operations. However, the generic site design and cost estimate could apply to facilities at other locations. The generic site design and cost estimate is broken into three phases. They include:
    - Phase 1 – Site and utility work, 15 articulated buses, 40 regular buses, 1 wash/service island, and 6 maintenance bays.
    - Phase 2 – Office support space, 10 articulated buses, 120 regular buses, 1 wash/service island, and 12 maintenance bays.
    - Phase 3 – Additional office support space, 5 articulated buses, 85 regular buses, and 10 maintenance bays.
- The former Kraft/Oscar Mayer site near Highway 30 and Packers Avenue – The site is now owned by Reich Brothers Holdings and the City has the opportunity to lease or purchase Buildings 43 and 50 on the north side of the site. It would be suitable for a satellite facility to supplement a larger facility. Additional buildings could make it suitable to host all of Metro's operations. A rail crossing exists on the site that could be used to access the North Transfer Point. The following are the characteristics of the site:


*Figure ES.2-1 Location of the Oscar Mayer site*

    - Building 43 – 36 regular buses, or a combination of articulated buses and regular buses, and a bus wash.
    - Building 50 – 24 regular buses, or a combination of articulated buses and regular buses.
    - Area – The northern portion of the site which includes Buildings 43 and 50 encompasses about 15 acres, which depending on site configuration, could be enough land for a full relocation of the 1101 East Washington Ave facility.

- The former Cub Foods site on Nakoosa Trail – This site was purchased by the City for municipal fleet use, and part of the site would be available for a Metro facilities site. This alternative site would have the following features.
    - 20 standard buses
    - 36 articulated buses
    - 2 wash/service islands
    - 9 service bays
    - Area – the portion of the site available is about 5.75 acres, which is sufficient for a satellite facility but would not allow Metro to relocate all buses and services from the 1101 East Washington Ave facility.

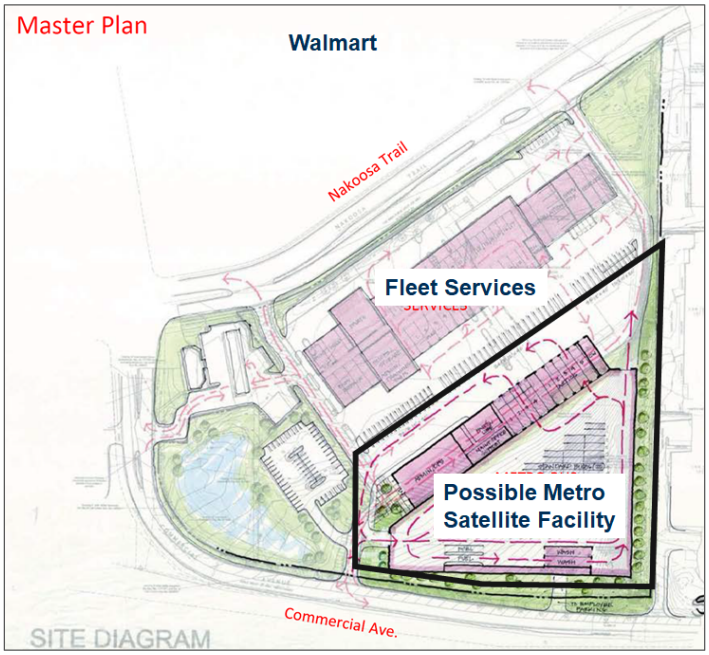


*Figure ES.2-2 Nakoosa Trail Site Plan*

  The topography of the Nakoosa site increases construction cost. Also, Metro use of this site would prevent fleet or other City services from using it in the future.
- East and West Locations – It has been suggested that Metro might operate more efficiently if there were two sites serving the City, one on the west side and one on the east side. This alternative site assumes one east and one west site near the transfer points. For the purposes of this analysis, each site was assumed to have the following features:
    - 120 standard buses
    - 20 to 25 articulated buses
    - 1 wash/service island
    - 14 service bays
    - Office support space.

## ES.3 Scenarios

As mentioned, scenarios combine alternative sites and involve different building improvements, in different locations, with different implementation periods. These scenarios are detailed in Section 2 of this report and are summarized by the following graphic Figure ES.3-1.

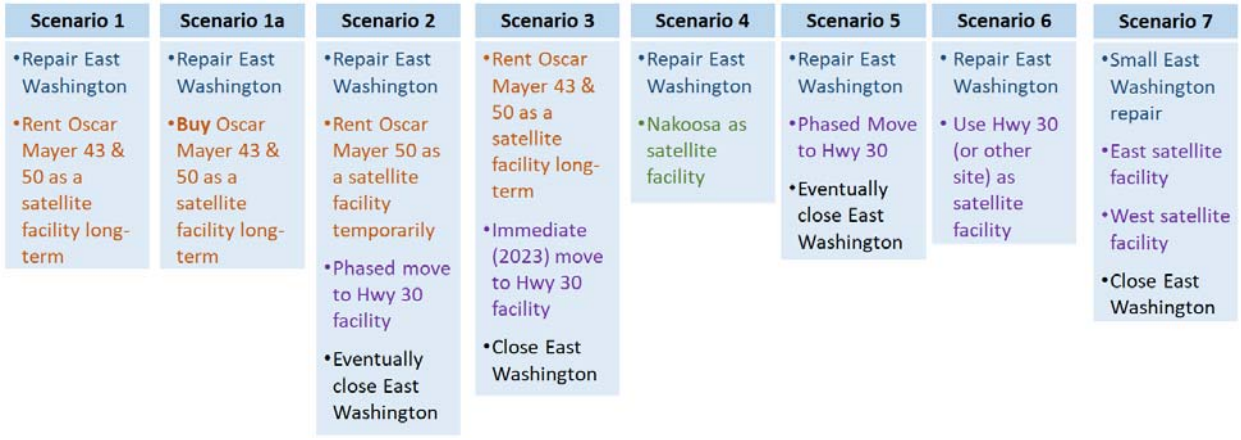


*Figure ES.3-1 Scenarios*

## ES.4 Evaluation Criteria and Analyses

The evaluation criteria directly correspond to the identified needs. The study conducted several analyses to evaluate how well a scenario satisfies a need. As mentioned, the "critical needs" are satisfied with each scenario because they are fundamental to the action. For example, the City of Madison is going to build a facility that provides safety for drivers and workers. "Other needs" represent needs that vary between the scenarios, such as financial feasibility and cost effectiveness. These needs are differentiators between the scenarios. To evaluate these other needs, this study performed:

- A net present value (NPV) of the costs of each alternative.
- A deadhead and relief analysis that helped quantify the operational costs associated with having buses travel empty from a satellite location as well as driver relief costs.
- Estimates of probable construction costs for the improvements within each scenario.
- Snapshots of the yearly debt service associated with each scenario in the year 2025 and 2030.

## ES.5 Critical Needs

All scenarios evaluated, except for the do nothing alternative, satisfy the critical needs. They address safety within the metro facilities for drivers as they maneuver within the facilities. They also address other needs, such as air quality, availability of restrooms, and reasonable support facilities for drivers and support staff such as break and training rooms. All scenarios evaluated, provide additional bus storage, which in turn provides the ability to expand service. All scenarios provide the ability to store and maintain Bus Rapid Transit vehicles, specifically 60-foot articulated buses. And all scenarios provide the ability to transition metro's fleet to electric buses by the year 2035.

## ES.6 Other Needs

A. Financial feasibility

To meet Metro's facility needs a location of scenario must be feasible. This means the City must be able finance and service debt while also addressing the capital needs of other City initiatives.

1. Capital Improvement Program

The City's six year capital improvement plan included in the 2019 adopted capital budget identifies over $550 million of new general obligation borrowing for capital projects. This amount includes nearly $90 million for renovating the current Metro Transit bus maintenance and storage facility on East Washington Avenue and constructing a new satellite bus maintenance and storage facility. Constructing a new facility to replace the current bus maintenance and storage facility could add $60 million to that amount.

2. Debt Service

Debt service for Metro Transit projects in the current capital improvement plan, including the normal replacement cycle of 15 buses annually, is anticipated to increase from $2 million in 2019 to $13 million in 2025. These amounts assume that 20 year bonds will be issued to finance Metro Transit projects, rather than the 10 year promissory notes typically issued to finance city capital projects. The incremental cost of a new facility would increase that debt service estimate to $18 million in 2025. These costs will be almost wholly borne by the city's general fund through the annual subsidy provided to the Metro Transit enterprise fund. Assuming that the property tax levy increases at 5 percent annually, on average, the debt service on bonds issued to finance current Metro Transit projects in the capital improvement program would increase from approximately 1 percent of the property tax bill on the average value home in 2019 to 4 percent by 2025 (6 percent with a new facility). Managing and minimizing this debt service makes an alternative or scenario more feasible.

B. Cost Effectiveness

1. Net Present Value of Costs

The study performed a net present value analysis of the costs associated with each alternative and scenario. A Net Present Value (NPV) analysis monetizes the benefits and costs of an alternative or scenario over a period of time, taking into the effects of inflation and the cost of money. Since the benefits of increased safety, increased storage (and associated service expansions), BRT accommodation, and electric buses are the same for all scenarios, only a NPV of the costs associated with each alternative are analyzed. This report performed the NPV analysis of costs using the procedures outlined in White House Advisory Circular A-94. The study performed the analysis using a range of discount rates and end-year rehabilitation strategies.

2. Operating Costs

Much of Metro's operating costs is associated with labor and fuel. Therefore, keeping buses in service while traveling reduces operating costs. Deadheading is when a bus travels out of service to the start of a route, or travels out of service from the end of a route to the facility. Deadheading increases operating costs and the location of Metro's storage facilities affects the amount of deadheading. The analysis also included the costs of providing relief drivers. The study analyzed the annual deadhead costs associated with each of the scenarios using Trapeze software, the existing route structure, and logical modifications associated satellite facility locations. The change in annual operating costs ranged from $0 to $1.2 million. Section 3 of this report provides more information regarding the deadhead analysis.

Table ES.6-1 summarizes the results of the analysis. The table also shows the Net Present Value of costs per bus and debt service needed for each Alternative site. Alternative sites that use existing buildings have the lowest Net Present Value of costs.

*Table ES.6-1 Net Present Value Site Costs Summary*

| **Facility Type** | Primary | Satellite | Primary/ Satellite | Primary | Satellite | Satellite | Primary |
|---|---|---|---|---|---|---|---|
| **Alternative Site** | **1101 East Wash** | **Hwy 30 Phase 1** | **Hwy 30 Phase 1&2** | **Hwy 30 Phase 1,2&3** | **Oscar Mayer** | **Nakoosa** | **East and West** |
| Number of buses | 215 | 55 | 185 | 273 | 60 | 56 | 280 |
| Capital Improvement Program | | | | | | | |
| Total CIP (2019-2024) | $57.1M | $70.3M | $138.6M | $168.1M | $13-$19.0M | $49.8M | $200.5M |
| CIP cost per bus | $266K | $1,277K | $749K | $615K | $281K | $890K | $716K |
| Debt Service | | | | | | | |
| 2025 Debt service 10yr, 3% | $6.7M | $8.2M | $16.2M | $19.7M | $2.0M | $5.8M | $23.5M |
| 2025 Debt service 20yr, 3% | $3.8M | $4.7M | $9.3M | $11.3M | $1.1M | $3.4M | $13.5M |
| Net Present Value 7% Nominal Discount Rate | | | | | | | |
| NPV of costs 7% | $46M* | $52M | $104M | $127M | $19M* | $37M | $151M |
| NPV cost per bus 7% | $215k* | $952k | $564k | $465k | $317k* | $655k | $540k |
| Operating Costs | | | | | | | |
| Added Annual Deadhead Op Cost | $0M | $0M | +$1.1M | +$1.1M | $0 | $0M | +$0.9M |
| *Includes $60M rehabilitation in 2045 CIP = Capital Improvement Program<br>NPV = Net Present Value of costs for facility life until 2050 | | | | | | | |
| Objective: House 270 buses in a primary facility, or in a primary facility with a satellite | | | | | | | |

Table ES.6-2 provides the Net Present Value of the scenario costs. Scenarios that use existing buildings tend to have the lowest Net Present Value of costs.

*Table ES.6-2 Net Present Value of Scenario Costs*

| | **Scenario 1** | **Scenario 1A** | **Scenario 2** | **Scenario 3** | **Scenario 4** | **Scenario 5** | **Scenario 6** | **Scenario 7** |
|---|---|---|---|---|---|---|---|---|
| | Upgrade 1101 East Washington<br><br>Rent Oscar Mayer Bldgs 43 &50 | Upgrade 1101 East Washington<br><br>Buy Oscar Mayer Bldgs 43 &50 | Upgrade 1101 East Washington<br><br>Rent Oscar Mayer Bldg 43<br><br>Phased Move to Hwy 30 Site by 2033 | Small upgrade to 1101 East Washington<br><br>Rent Oscar Mayer Bldg 43 & 50<br><br>Immediate Move to Hwy 30 Site in 2024 | Upgrade 1101 East Washington<br><br>Nakoosa Satellite Facility in 2023 | Upgrade 1101 East Washington<br><br>Phased Move to Hwy 30 Site by 2033 | Upgrade 1101 East Washington<br><br>Hwy 30 Satellite - 2023 | East Facility - 2028<br><br>West Facility - 2023 |
| Net Present Value of costs 5% | $98M* | $68M* | $125M | $112M | $116M* | $125M | $88M* | $117M |
| Net Present Value of costs 7% | $83M* | $61M* | $127M | $114M | $99M* | $123M | $84M* | $121M |
| Net Present Value of costs 10.2% | $67M* | $53M* | $117M | $154M | $81M* | $112M | $76M* | $113M |
| *Includes $60M rehabilitation in 2045 CIP = Capital Improvement Program<br>NPV = Net Present Value of costs for facility life until 2050 | | | | | | | | |

C. Potential Offsetting Costs

If all Metro activities were moved from the 1101 East Washington Ave. facility, that property would be available to sell. Additionally, the resulting redevelopment of the parcel could provide a tax base, generating property tax revenue for the City.

Rough estimates of the 1101 East Washington Ave. facility value range from between $10 and $12 million. The parcel is in Urban Design District 8 and is zoned for traditional employment. Madison's property tax mill rate is $24.5 per $1,000 of assessed value and the City receives about 37 percent of the property tax generated by a parcel. If one assumes that no TIF funding affects property tax revenues for the parcel, the City would receive about $0.9 million yearly in property tax ($100 million x (24.5 / 1000) x 0.37). While an important revenue source, this amount would not offset the debt service payments needed to fully relocate from the 1101 East Washington Ave facility, which could range from $10 to $20 million per year, depending on the term and facility. This is also true, even if one considers money (and debt service saved) by not investing $57 million in infrastructure improvements at 1101 East Washington Ave facility. Figure ES-6.1 illustrates the cash flow situation. The left side of the graph shows the cash flow debt service if the 1101 East Washington Ave facility is both kept and improved. The right side of the graph shows the property tax revenue that would be gained from the redevelopment of the 1101 East Washington Ave facility, compared with the debt service that would be needed to build a facility large enough to relocate from the 1101 East Washington Ave facility.

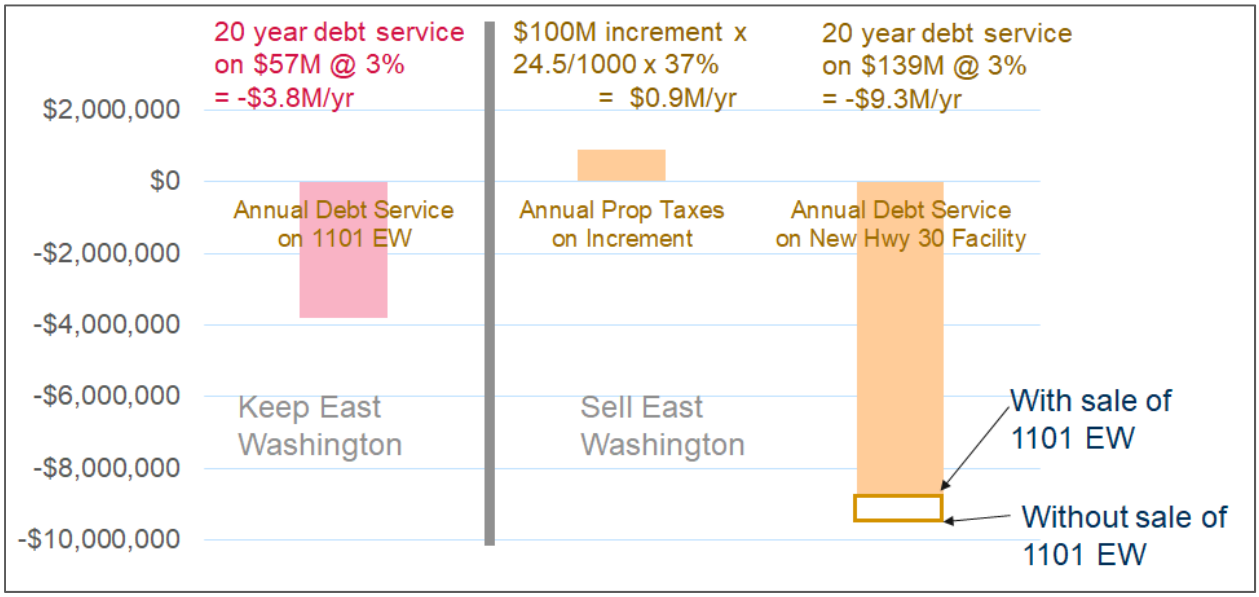


*Figure ES-6.1 Potential offsetting costs*

## ES.7 Desires

Desires are characteristics of scenarios that are not essential for Metro, but provide benefits to the agency and its mission.

A. Ability to satisfy local Match Requirement for Federal Transit Agency (FTA) Small Starts Grant

Madison is able to count the portion of an infrastructure improvement allocated for Bus Rapid Transit towards satisfying the local match requirement for an FTA Small Starts Grant. One condition is that the City of Madison must own the improvement. Therefore, Scenario 1, which only rents from the Oscar Mayer site, would not qualify as a local match for a Small Starts Grant. All other scenarios would be able to have a portion of the property and construction costs count towards the local match.

B. Preserve the ability to relocate the 1101 East Washington facility 20 years in the future.

The current 1101 East Washington Facility without administrative offices occupies 10.2 acres. At some point in the future the City may desire to relocate all or a portion of their operations from this facility. It is estimated that to accommodate 285 buses, a site of 16 acres would be needed. If just a portion of the 1101 East Washington Facility were relocated, a smaller site could be used. Ultimately, sites such as the Oscar Mayer site, and a possible Highway 30 site, could accommodate a full relocation of operations and closure of the 1101 East Washington Ave. facility.

C. Having control of the site at the end of the analysis period.

The City of Madison values the ability to control a site beyond the use period. Having this ability allows the City to continue operations at the site, or pursue a different course of action, without having rental agreements influence or force the decision. The scenario that uses rented facilities (Scenario 1) does not give the City the ability to control the property after the analysis period.

## ES.8 Summary of Scenario Evaluation

The following table briefly summarizes how each scenario, which implements the alternatives over a period of time, satisfies Metro's needs. A more complete explanation is provided in relevant sections of this report.

**Table ES.8-1 Scenario Evaluation**

| | | Scenario 1 | Scenario 1A | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5 | Scenario 6 | Scenario 7 |
|---|---|---|---|---|---|---|---|---|---|
| | | Upgrade 1101 East Washington<br><br>Rent Oscar Mayer Bldgs 43 &50 | Upgrade 1101 East Washington<br><br>Buy Oscar Mayer Bldgs 43 &50 | Upgrade 1101 East Washington<br><br>Rent Oscar Mayer Bldg 43<br><br>Phased Move to Hwy 30 Site by 2033 | Small upgrade to 1101 East Washington<br><br>Rent Oscar Mayer Bldg 43 & 50<br><br>Immediate Move to Hwy 30 Site in 2024 | Upgrade 1101 East Washington<br><br>Nakoosa Satellite Facility in 2023 | Upgrade 1101 East Washington<br><br>Phased Move to Hwy 30 Site by 2033 | Upgrade 1101 East Washington<br><br>Hwy 30 Satellite (Phase 1 only) - 2023 | East Facility - 2028<br><br>West Facility - 2023 |
| **Critical Needs** | | | | | | | | | |
| Driver and Worker Safety | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Accommodate BRT & Elect Buses | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Bus Storage | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Other Needs** | | | | | | | | | |
| Feasibility – CIP 2019-2028 | | $64M | $73M | $204M | $161M | $112M | $203M | $115M | $267M |
| Feasibility – CIP 2019-2040 | | $64M | $73M | $246M | $206M | $112M | $244M | $115M | $267M |
| Feasibility – Debt Service 2025+ | | $7.5M | $8.5M | $13.7M | $19.0M | $13.1M | $13.5M | $13.4M | $15.8M |
| Feasibility – Debt Service 2030+ | | $4.8M | $5.8M | $21.8M | $19.0M | $11.2M | $22.0M | $11.6M | $29.4M |
| Cost Eff - NPV of Costs 7% | | $83M* | $61M* | $127M | $113M | $99M* | $123M | $84M* | $121M |
| Cost Eff - Increase in Annual Deadhead Costs | | $0M | $0M | +$1.1M | +$1.1M | $0M | +$1.1M | +$0.2M | +$0.9M |
| **Desires** | | | | | | | | | |
| Satisfy FTA local match | | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Preserve ability to relocate from 1101 | | No | Possibly | Yes | Yes | No | Yes | No | Yes |
| Control of property | | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Intangibles** | | | | | | | | | |
| Property Currently Available? | | NA | Yes | No | No | No | No | No | No |
| Other? | | | | | | | | | |

*Includes $60M rehabilitation in 2045 CIP = Capital Improvement Program
NPV = Net Present Value of costs for facility life until 2050 +Debt service at 3% - 10yr note

## ES.9 Observations and Recommendations

Addressing bus storage and obtaining a satellite facility for Metro is a primary objective in area plans.

- It is Strategy 2a in the Landuse and Transportation element of the Imagine Madison Comprehensive Plan, and it is also a prerequisite for implementing Strategies 1a, and b.
- It is called out as a need in the Madison in Motion Transportation Plan
- It is recommended in the 2013-2017 Transit Development Plan (MATPB), and is a prerequisite to accomplishing other service improvements presented in the plan.
- It is recommended in the Regional Transportation Plan 2050 (MATPB)

This study recommends:

- Continuing to use and invest in 1101 East Washington Ave as the primary facility for Metro operations.
- Further investigation and pursuit of purchasing the Oscar Mayer site.

This recommendation is consistent with Scenario 1A and has:

- The lowest capital expenditure and corresponding debt service.
- The lowest net present value of costs.
- No increase in operating (deadhead) costs.
- The ability to count towards FTA Small Starts local match.
- The lowest housing cost per bus.
- Preserves the ability to relocate all, or a portion of Metro's operations from the 1101 East Washington Ave facility.

Current conditions provide the opportunity to cost-effectively address bus storage capacity and a key recommendation in current planning documents. Providing additional bus storage is a prerequisite for Metro to address other strategic initiatives, such as peripheral service and BRT, to serve the metropolitan area, and consequently is highly important.

# Section 2

# Alternatives and Scenarios

## 2.0 Introduction

This report studies alternative sites to understand how cost effective providing a metro facility is at each site. The report also investigates courses of action, or scenarios that would provide a template for Metro infrastructure investment over the next two decades. Scenarios represent not just building a facility at a site, but a sequence and timing of actions that meet Metro's needs until 2050. Scenarios involve purchasing or improving alternative sites, in different years, to satisfy Metro's need to store and maintain its fleet. The following paragraphs briefly describe the alternative sites being considered.

## 2.1 Alternative Sites

Several sites have been identified as being potential hosts for either Metro's main center of operations, or as a satellite bus facility. Sites need to have several qualities in order to be considered viable. They need to be large (five or more acres), available to the City at a reasonable cost in a reasonable time frame, and in a good location. The location needs to be suitable in that it is an appropriate land use for the surrounding neighborhoods and has fast and easy access to major arterials with low deadhead travel times to Metro's route terminals. The following paragraphs summarize alternative sites.

- 1101 East Washington Ave – Primary Site
  Metro's current single bus facility at 1101 East Washington Ave is relatively central to Madison and its service area. It holds 215 standard 40-foot buses on about 10 acres (including parking and administration). Although some space was freed up when Metro discontinued directly operated paratransit service, the facility cannot accommodate additional buses needed for service expansion. It is challenging to purchase additional property adjacent to the 1101 East Washington Ave facility in order to expand the facility. It has been close to 40 years since this facility had a major improvement and the facility needs substantial investment to continue operation. Plans have been made to upgrade the facility to address maintenance and health and safety needs. The phased improvement plan would be spread over 5 years and is estimated to cost about $57 million.


*Figure 2.1-1 Existing 1101 East Washington Ave Facility*

- Highway 30 Site – Primary or Satellite Site – Madison enlisted the services of Mead & Hunt to prepare a generic site design and cost estimate for programming purposes to evaluate the cost effectiveness of constructing a new facility versus purchasing and repurposing an already constructed facility. The generic site is referred to being located near Highway 30 and Packers Ave in that this location is relatively efficient for metro operations, yet the generic site design and cost estimate could apply to facilities at other locations. The generic site design and cost estimate is broken into three phases. They include:

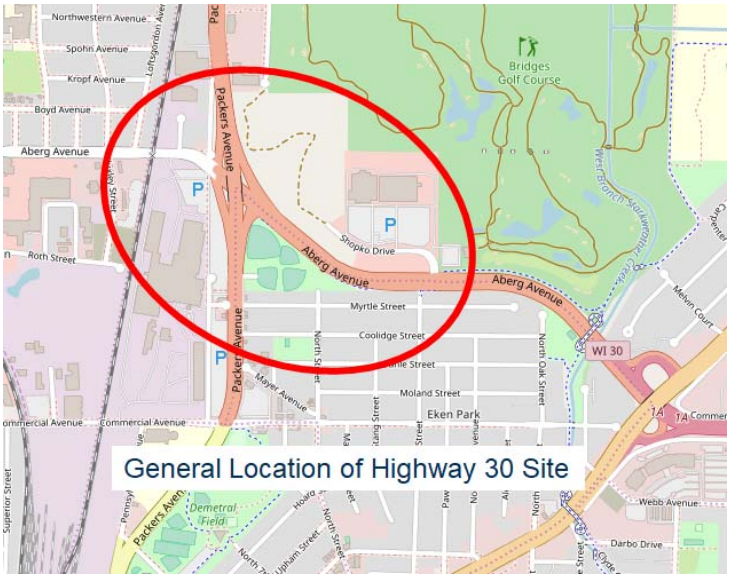


*Figure 2.1-2 General Location of the Hwy 30 site.*

  - Phase 1 – Site and utility work, space for 15 articulated buses and 40 regular buses, 1 wash/service island, and 6 maintenance bays.
  - Phase 2 – Office support space, space for an additional 10 articulated buses and 120 regular buses, 1 wash/service island, and 12 maintenance bays.
  - Phase 3 – Additional office support space, space for an additional 5 articulated buses and 85 regular buses, and 10 maintenance bays.

- The former Kraft/Oscar Mayer site near Highway 30 and Packers Ave – The site is now owned by Reich Brothers Holdings and the City has the opportunity to lease or purchase Buildings 43 and 50 on the north side of the site. It would be suitable for a satellite facility to supplement a larger facility. An existing rail crossing exists that could be used to access the North Transfer Point. The City could choose to lease or purchase the site. The following are the characteristics of the site:
  - Building 43 – 36 regular buses, or a combination of articulated buses and regular buses, and a bus wash.


*Figure 2.1-3 Location of the Oscar Mayer site.*

  - Building 50 – 24 regular buses, or a combination of articulated buses and regular buses.
  - Area – The northern portion of the site which includes Buildings 43 and 50 encompasses about 15 acres, which depending on site configuration, could be enough land for a full relocation of the 1101 East Washington Ave facility.

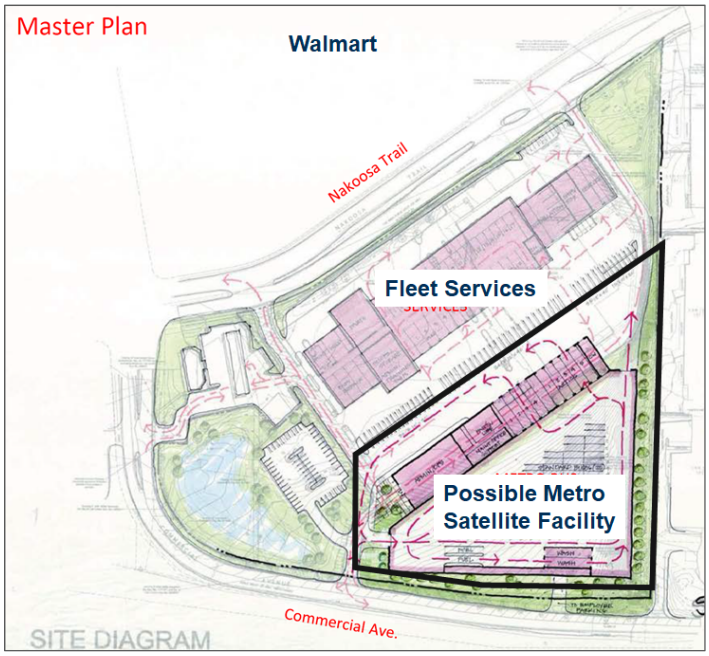

*Figure 2.1-4 Nakoosa Trail Site Plan*

- The former Cub Foods site on Nakoosa Trail – This site was purchased by the City for municipal fleet use. The southeast corner was previously identified as a site for a satellite bus facility on a site shared with Madison's Fleet Maintenance building. The City has applied for several unsuccessful TIGER grants for a project projected to cost $35 million, but cost estimates have since increased to between $41 and $51 million, depending on equipment and sustainability features. This alternative site would have the following features.
  - 20 standard buses
  - 36 articulated buses
  - 2 wash/service island
  - 9 service bays
  - Area – the portion of the site available is about 5.75 acres, which is sufficient for a satellite facility but would not allow Metro to relocate all buses and services from the 1101 East Washington Ave facility.
- East and West Locations - Some have suggested that Metro might operate more efficiently if there were two sites serving the City, one on the west side and one on the east side. This alternative site assumes one east and one west site near the transfer points. For the purposes of this analysis, each site was assumed to have the following features:
  - 120 standard buses
  - 20 to 25 articulated buses
  - 1 wash/service island
  - 14 service bays
  - Office support space.

## 2.2 Scenarios

As mentioned, Scenarios represent not just building a facility at a site, but a sequence and timing of actions that meet Metro's needs until 2050. Figure 2.2-1 summarizes the different scenarios, followed descriptions of the scenario.

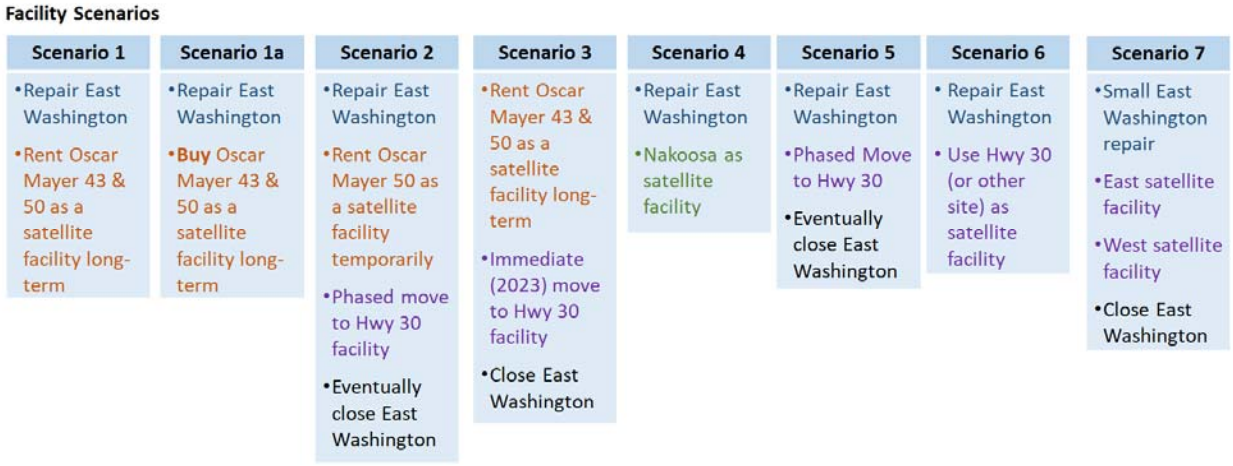


*Figure 2.2-1 Facility Scenarios*

**Scenario 1** – Upgrade East Washington Ave and Rent Oscar Mayer Satellite and

2019-2025 Upgrade East Washington Ave Facility – Phases 1-4
2019 Renovate Oscar Mayer Buildings 43 and 50, rent through 2050

This scenario maintains operations on East Washington Ave and expands bus storage by renting Oscar Mayer Buildings 43 and 50. Buildings 43 and 50 are improved at the City's expense. Leasing eliminates the need for a large one-time capital land purchase, but is expensive over time. The rental fees cannot be used as a local match for a Small Starts grant for BRT.

**Scenario 1A –** Upgrade East Washington Ave and Purchase at Oscar Mayer Satellite

2019-2025 Upgrade East Washington Ave Facility – Phases 1-4
2020 Purchase north 15 acres of Oscar Mayer Site, including Buildings 43 and 50

This scenario maintains operations on East Washington Ave and purchases the north 15 acres of the Oscar Mayer site. Buildings 43 and 50 are improved at the City's expense, similar to Scenario 1, but the City purchases the land and buildings. The purchase requires a larger initial investment. Purchase costs of land and buildings associated with BRT implementation can be counted towards the local match for a Small Starts grant.

**Scenario 2 –** Upgrade East Washington Ave- Phased Move to Highway 30 Facility using Oscar Mayer to Stage

2018-2023 Upgrade East Washington Ave facility Phases 1-3b
2019-2030 Renovate and rent Oscar Mayer Building 43
2023-2024 Build Phase 1 of a new facility at Highway 30
2028-2032 Phases 2 and 3 of the Highway 30 facility, relocate from East Washington Ave, and close Oscar Mayer site

This scenario implements only Phases 1-3b to upgrade the East Washington Facility, with the goal of relocating all operations from the East Washington facility by the year 2033. This would then leave the 1101 East Washington site available for environmental remediation and redevelopment. Building 43 of Oscar Mayer is rented in 2019 to address immediate storage needs. Phase 1 of a satellite facility near Highway 30 and Packers Ave is built in 2023. Phases 2 and 3 are built in 2028 and 2032 respectively, allowing the full relocation of operations from 1101 East Washington Ave and the closure of the Oscar Mayer site.

**Scenario 3 –** Immediate Relocation of East Washington Facility to Highway 30 and Oscar Mayer Bldgs 43 and 50

| | |
|---|---|
| 2019 | Small repairs to East Washington Ave to address safety issues |
| 2019 | Renovate and rent Oscar Mayer Buildings 43 and 50 |
| 2023-2024 | Build Phases 1 and 2 of a Highway 30 facility, close East Washington facility |
| 2034-2035 | Build Phase 3 of Highway 30 facility, close Oscar Mayer site |

This scenario is similar to Scenario 2 but it allows a full relocation of the 1101 East Washington facility by the year 2025. To accomplish this, Phases 1 and 2 of a new facility near Highway 30 and Packers Ave is constructed, and Oscar Mayer Buildings 43 and 50 are used to house overflow buses until Phase 3 of the Highway 30 facility is constructed in 2034. This allows the 1101 East Washington site available for environmental remediation and redevelopment.

**Scenario 4** – Upgrade East Washington Ave Facility, Build Nakoosa Trail Satellite

| | |
|---|---|
| 2018-2025 | Upgrade East Washington Ave facility Phases 1-4 |
| 2023-2024 | Build a new satellite facility at Nakoosa Trail |

This scenario reflects the City's strategy for the last several years. It upgrades the East Washington Ave facility, building Phases 1-4. It also builds a satellite facility at Nakoosa Trail on part of the parcel once occupied by Cub Foods. Because the Nakoosa Trail site is too small to fully relocate Metro operations to, this scenario would continue to use the 1101 East Washington Ave facility through 2050.

**Scenario 5** – Upgrade East Washington Ave Facility, Phased Relocation to Highway 30 Facility

| | |
|---|---|
| 2018-2023 | Upgrade East Washington Ave facility Phases 1-3b |
| 2023-2024 | Build Phase 1 of a satellite facility near Highway 30 and Packers Ave. |
| 2028-2032 | Build Phases 2 and 3 of Highway 30 facility and close East Washington Ave facility |

This is exactly the same as Scenario 2, except that it does not use Oscar Mayer Building 43 as a staging area. Metro operations are relocated from 1101 East Washington Ave by 2033.

**Scenario 6** – Upgrade East Washington Ave, Build Phase 1 of a Satellite Facility near Highway 30

| | |
|---|---|
| 2018-2025 | Upgrade East Washington Ave facility Phases 1-4 |
| 2023-2024 | Build Phase 1 of a satellite facility near Highway 30 |

This scenario upgrades the East Washington Ave facility, building Phases 1 – 4. It also opens a satellite facility near Highway 30 and Packers Ave. This scenario maintains primary operations at Metro's East Washington Ave facility through 2050, yet preserves future relocation with the Highway 30 site.

**Scenario 7** – Minor Upgrades to East Washington Ave, Build West and East Satellite Facilities

| | |
|---|---|
| 2018-2025 | Upgrade East Washington Ave facility Phases 1&2 |
| 2023 | Build West Satellite Facility near west transfer point. |
| 2028 | Build East Satellite Facility near east transfer point, close East Washington Ave facility. |

This scenario was developed because Metro may be better able to serve the Madison area with a west and an east facility, rather than one or two facilities on the isthmus and east side. The scenario provides minor upgrades to the East Washington Ave facility, building only Phases 1 and 2. It builds a west satellite facility housing about 140 buses near the west transfer point in 2023. It then builds an east

satellite facility, also housing about 140 buses, near the east transfer point in 2028. No actual sites have been identified on the east or west side.

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# Section 3

# Deadhead Analysis

## 3.0 Introduction

Deadheading is when a bus travels empty between the garage and terminal, which decreases efficiency because the bus is not serving customers. This analysis also includes travel for relief drivers, where a bus operator drives in a car or walks to a spot on the route and relieves another driver, who drives in a car or walks back to the garage. Deadheading wastes time, materials, fuel, and money. The location of a main or satellite facility could impact the amount of deadheading, potentially increasing operating costs to Metro. This deadheading analysis assesses the impact to Metro under several facility locations. Metro's current facility at 1101 East Washington Ave is used as a baseline to measure the efficiency of other facility locations. Metro's location at 1101 East Washington Ave has some advantages in reducing deadheading and relief costs. Many deadhead buses go to the Capitol Square, which is only 5 to 10 minutes away, or to campus and the transfer points. Relief drivers can often simply walk to their reliefs on Ingersoll Street without having to drive in a car to a route terminal.

This analysis is intended to be "level of magnitude" of the costs of buses traveling empty. Satellite locations would facilities maintain or decrease deadhead and relief expenses while moving all buses out of Ingersoll Street increases them substantially.

## 3.1 Alternatives and Scenarios

Numerous alternative sites were evaluated in the deadhead analysis. They include:

1. 1101 East Washington Ave (baseline)
2. Near Highway 30 and Packers Ave. (Phases 1, 2, and 3)
3. Oscar Mayer site
4. Nakoosa Trail site
5. East satellite near the east transfer point.
6. West satellite near the west transfer point.

As mentioned in Section 2, these different site locations have been arranged into scenarios, summarized by Figure 3.1-1.

**Facility Scenarios**

| Scenario 1 | Scenario 1a | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5 | Scenario 6 | Scenario 7 |
|---|---|---|---|---|---|---|---|
| •Repair East Washington<br>•Rent Oscar Mayer 43 & 50 as a satellite facility long-term | •Repair East Washington<br>•**Buy** Oscar Mayer 43 & 50 as a satellite facility long-term | •Repair East Washington<br>•Rent Oscar Mayer 50 as a satellite facility temporarily<br>•Phased move to Hwy 30 facility<br>•Eventually close East Washington | •Rent Oscar Mayer 43 & 50 as a satellite facility long-term<br>•Immediate (2023) move to Hwy 30 facility<br>•Close East Washington | •Repair East Washington<br>•Nakoosa as satellite facility | •Repair East Washington<br>•Phased Move to Hwy 30<br>•Eventually close East Washington | • Repair East Washington<br>• Use Hwy 30 (or other site) as satellite facility | •Small East Washington repair<br>•East satellite facility<br>•West satellite facility<br>•Close East Washington |

*Figure 3.1-1 Facility Scenarios*

## 3.2 Results and Conclusions

The analysis used a spreadsheet tool to predict changes in deadhead and relief times. The analysis used an operating cost of $100 per hour. The analysis results do not directly correspond to the scenarios

being considered, but they do provide a level of magnitude of increased operating costs associated with each location. Table 3.2-1 summarizes the analysis results.

*Table 3.2-1 Deadhead Analysis Results*

| Corresponding Scenario | Description | Annual Deadhead and Relief Hours | Estimated Cost | Cost Increase |
|---|---|---|---|---|
| | All buses at 1101 East Washington Ave (baseline scenario) | 32,604 | $3.26 M | |
| 1 and 6 | 1101 East Washington Ave and Oscar Mayer Satellite (or Hwy 30) | 32,694 | $3.27 M | +0.3% +$0.01 M |
| 3, 2&5 ultimate | All buses at a Highway 30/Packers Ave site | 43,413 | $4.34 M | +33.2% +$1.08 M |
| 4 | 1101 East Washington Ave and a Nakoosa Satellite Facility | 32,885 | $3.29 M | +0.9% +$0.03 M |
| ~6 or 7 | 1101 East Washington Ave and a South Satellite Facility near the South Transfer Point | 34,353 | $3.44 M | +5.4% +$0.18 M |
| ~6 or 7 | 1101 East Washington Ave + West Transfer Point Satellite | 34,540 | $3.45 M | +5.9% +$0.19 M |
| 7 | A Highway 30 Satellite and a West Satellite near the West Transfer Point Satellite | 41,418 | $4.14 M | +27.0% +$0.88 M |

Key observations from the analysis include:

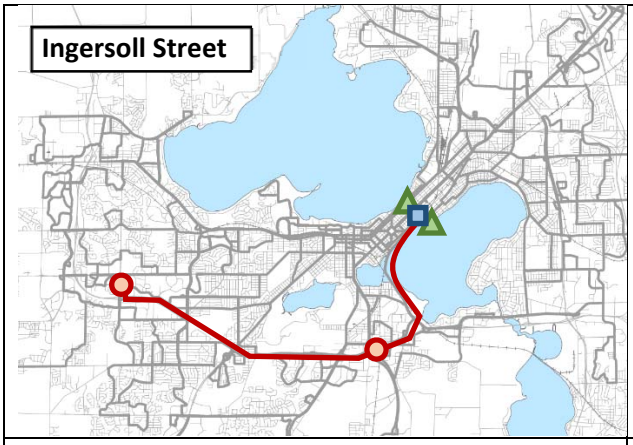
- The increase of deadheading and relief costs, based on location, ranges from almost nothing to about $1.15 million a year.
- Alternatives or scenarios that relocate all Metro operations from the 1101 East Washington Ave facility increase deadheading costs by about $1 million.
- Alternatives or scenarios that maintain 1101 East Washington Ave as the base of operation, and add a satellite facility have modest to no effect on deadhead and relief costs. This is because vehicle blocks that start and end in the periphery can be chosen to be moved to the satellite facility.

## 3.3 Analysis Details and Assumptions

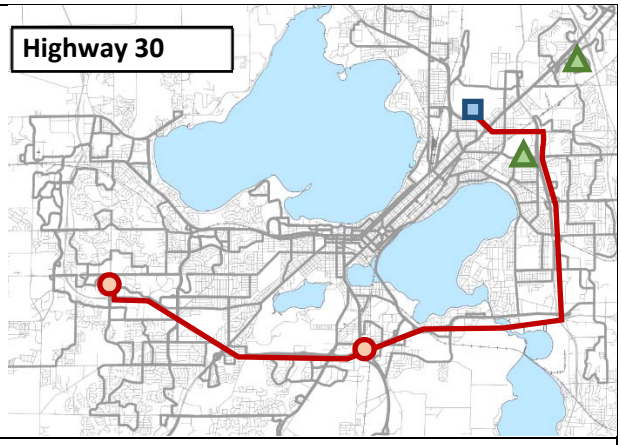
In their scheduling, Metro first schedules trips. A trip is designated as a line in the ride guide, a bus going from one end of the route to the other at a certain time. Then Metro assembles trips together into blocks, a block is what a bus does all day long. Some blocks can be up to 20 hours long, so Metro then cut blocks into runs, a run is a driver's work for the day.

This deadhead analysis kept all vehicle blocking the same, for simplicity, and because Metro's block start and end points are fairly distributed evenly around the system. For alternatives with more than one garage, blocks were assigned to a garage based on their start and end locations. For example, blocks starting and ending on the north side of town were likely to be assigned to Oscar Mayer and Highway 30. It is assumed that these satellite facilities would have 35 buses out at peak times. Additionally, effort was made to send a mix of AM peak, PM peak, and all-day blocks to the satellite facilities. The satellites are assumed to be closed on weekends with all buses being dispatched out of the main garage.

Runs are kept as similar to how they are today as possible. Relief points were adjusted to suite the alternative garage location sites. All Ingersoll reliefs were relocated for blocks not dispatched out of 1101 East Washington Ave, normally to the transfer points, East Towne Mall, or the nearest end of the line. An example of how reliefs are reorganized is shown graphically below.




Block 301 leaves Ingersoll at 4:56 am and deadheads to West Towne Mall. It performs 27 trips on Routes 2, 3, 6, 18, 20, 26, 30, 50, and 67 before going out of service at the South Transfer Point and heading back to Ingersoll at 12:35 am. In that time, the driver is relieved twice at East Washington and Ingersoll and once at Jenifer and Ingersoll.




If the block is moved to Highway 30, the deadhead path gets longer, although that is somewhat ameliorated by faster roads. The start and end points and 27 trips on 9 different routes remain the same. The three relief points are moved to East Towne Mall and the East Transfer Point.

Garage
Relief Point
Start/end Point

Block and run data was from Fall 2018 for weekdays, but from February 2018 for weekends and holidays because the Monroe Street Shuttle was introduced in March 2018, which caused significant temporary reblocking. All Supplemental School Service was omitted from the analysis for simplicity, but campus routes 80-84 were included. The year was simplified to assume 180 weekdays with the UW in session, 75 weekdays with the UW on recess, and 110 Saturdays. Sundays and holidays are similar to Saturdays from a deadhead perspective.

Deadhead times between each garage and start/end location were generalized. For Ingersoll deadheads times, Trapeze data was used to find the approximate scheduled times. For new garages, travel times were estimated with the assistance of Google Maps. In general, Ingersoll deadhead times were modified to account for the additional running time between the garage and Ingersoll Street, or, the travel time was calculated as the Google Maps estimated drive time x 1.5 + 2 minutes. Relief times are not scheduled but are specified in the driver contract and they are generally longer than deadhead times and rounded to the nearest 5 minutes. Relief times were similarly estimated for the alternative sites.

This analysis generally assumes platform hours are the sole indicator of operating cost. For service changes, Metro generally assumes that operating hours, mostly driven by wages and salaries, overshadows costs related to fuel, maintenance, and other factors. Since operating assistance from state and federal sources is already fully utilized, a fully-allocated cost of $100 per hour was used.

Additional deadheading may have additional costs and impacts beyond what is covered in this analysis. For example, Metro's partner agencies may be impacted by the cost and may choose to reduce service rather than absorb the cost. Extra relief cars and parking for operators who currently walk to relief points on Ingersoll Street may need to be factored into costs for a new facility.

# Section 4

# Net Present Value

## 4.0 Introduction

A standard criterion for deciding whether a government program or project can be justified on economic principles is Net Present Value – the discounted monetized value of expected net benefits (i.e., benefits minus costs). Net Present Value is computed by assigning monetary values to benefits and costs, discounting future benefits and costs using an appropriate discount rate, and subtracting the sum total of discounted costs from the sum total of discounted benefits. Net Present Value considers the effect of inflation, the impact of the cost of money (eg interest rate), and the residual value of improvements, or salvage value. A discount rate is used which considers the time value of money. By discounting benefits and costs that occur in different time periods, Net Present Value provides a common unit of measurement. Programs or projects with a positive Net Present Value increase social resources and are generally preferred.

Although Net Present Value is not always computable, efforts to measure it can produce useful insights even when the monetary values of some benefits or costs cannot be determined.

## 4.1 Satellite Facility Analysis of Net Present Value

A standard Net Present Value analysis analyzes benefits, subtracting costs, over time. For the Metro Facility analysis, there are many benefits that are shared with all of the alternatives and scenarios. They include:

- Increased worker safety due to improved air quality in the maintenance facility.
- Ability to expand Metro service, providing additional transportation access for area residents.
- Ability to improve Metro service frequency by providing the ability to implement Bus Rapid Transit service.
- Assists in a more sustainable transportation that helps decrease VMT and requires less infrastructure.

Efforts could be made to monetize these benefits over time, but it would be difficult. All of the above benefits are consistent with the Imagine Madison Comprehensive Plan and are constant between all of the alternatives. For these reasons, this Net Present Value analysis concerned itself with only the costs associated with the alternatives and scenarios. Alternatives and scenarios that have the lowest Net Present Value of costs provide the greatest economic value.

## 4.2 Discount Rate and Inflation

Economic analyses are performed by using current (nominal) or constant (real)-dollar values. Due to inflation, the purchasing power of the dollar changes over time, so in order to compare dollar values from one year to another, they need to be converted from nominal (current) dollar values to constant dollar values. Constant dollar value often is referred to as real dollar value. Nominal values must not be combined with constant dollars in the same analysis. Depending on which type of dollars are being used, a nominal dollar or constant dollar discount rate can be used.

The real (constant) discount rate, used with real dollars, is often considered to be the rate of return on a risk free investment, such as US Treasury notes, minus an index of inflation, such as the rate of change of the Consumer Price Index or Gross Domestic Product deflator. Real interest rates include only the systematic and regulatory risks (risk of loan default and taxation) and are meant to measure the time value of money. In a Net Present Value analysis using real dollars, costs are not inflated to year of expenditure before the real discount rate is applied, because the discount rate incorporates the effects

of inflation as costs are brought back to the base year. That is why the real discount rate is lower than the nominal discount rate.

The nominal discount rate, used with nominal dollars, is often what is advertised by lenders and is the rate of interest before adjustment for inflation. The nominal interest rate includes all three risk factors (risk of loan default, taxation, and inflation), plus the time value of the money itself. In a Net Present Value analysis using nominal dollars, costs are inflated to year of expenditure before the nominal discount rate is applied. As mentioned, this is the method used in this Metro facility analysis.

The procedures outlined in White House Advisory Circular A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*[1], where used in this analysis. These guidelines state the following regarding discount rates:

> *(1) A real discount rate that has been adjusted to eliminate the effect of expected inflation should be used to discount constant-dollar or real benefits and costs. A real discount rate can be approximated by subtracting expected inflation from a nominal interest rate.*
>
> *(2) A nominal discount rate that reflects expected inflation should be used to discount nominal benefits and costs. Market interest rates are nominal interest rates in this sense.*
>
> *In general, public investments and regulations displace both private investment and consumption. To account for this displacement and to promote efficient investment and regulatory policies, the following guidance should be observed.*
>
> *(1) Base-Case Analysis. Constant-dollar benefit-cost analyses of proposed investments and regulations should report net present value and other outcomes determined using a real discount rate of 7 percent. This rate approximates the marginal pretax rate of return on an average investment in the private sector in recent years. Significant changes in this rate will be reflected in future updates of this Circular.*

The following formula and table illustrates the relationship between nominal and real discount rates assuming a 3 percent inflation rate. Net Present Value Analyses prepared for federal programs may use multiple discount rates, but they must include an analysis using a 7 percent real discount rate, which amounts to a 10.2 percent nominal (real) discount rate. The Wisconsin Department of Transportation uses a real discount rate (which includes inflation) of 5 percent, which would be about 8 percent as a nominal dollar discount rate. Private investors often use lower discount rates and shorter terms.

$$i = \frac{i^1 - f}{1 + f}$$

$i$ = real discount rate
$i^1$ = nominal discount rate
$f$ = expected inflation rate

| Real (Constant) Discount Rate $i$ | Nominal (Current) Discount Rate $i^1$ | Inflation $f$ | |
|---|---|---|---|
| 8.7% | 12.0% | 3% | |
| 7.8% | 11.0% | 3% | |
| **7.0%** | **10.2%** | **3%** | Must be included in Federal analyses |
| 6.8% | 10.0% | 3% | |
| 5.8% | 9.0% | 3% | |
| 4.9% | 8.0% | 3% | |
| 4.0% | 7.1% | 3% | |
| 3.9% | 7.0% | 3% | |
| 2.9% | 6.0% | 3% | |
| 1.9% | 5.0% | 3% | |

[1] https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A94/a094.pdf

This analysis used a 3 percent inflation rate on construction and a 2 percent inflation rate on land. Multiple discount rates were applied. Low discount rates favor large capital-intensive projects with long lives; high discount rates favor projects with low capital projects with greater operational costs. To understand the effect of both, this analysis performed a Net Present Value analysis of cost using nominal discount rates of 5, 7, and 10.2 percent (to align with Federal requirements). A $60 million maintenance activity was added to the Net Present Value analysis for alternative sites that use existing buildings (eg 1101 East Washington Ave and Oscar Mayer). Table 4.2-1 summarizes the results of the analysis. The table also shows the Net Present Value of costs per bus and debt service needed for each Alternative site. Alternative sites that use existing buildings have the lowest Net Present Value of costs.

*Table 4.2-1 Net Present Value Analysis Summary*

| **Facility Type** | Primary | Satellite | Primary/ Satellite | Primary | Satellite | Satellite | Primary |
|---|---|---|---|---|---|---|---|
| **Alternative Site** | **1101 East Wash** | **Hwy 30 Phase 1** | **Hwy 30 Phase 1&2** | **Hwy 30 Phase 1,2&3** | **Oscar Mayer** | **Nakoosa** | **East and West** |
| Number of buses | 215 | 55 | 185 | 273 | 60 | 56 | 280 |
| Total CIP (2019-2024) | $57.1M | $70.3M | $138.6M | $168.0M | $13-19M | $49.9M | $200.5M |
| CIP cost per bus | $266K | $1,277K | $749K | $615K | $281K | $890K | $716K |
| 5% Nominal Discount Rate | | | | | | | |
| NPV of costs 5% | $51M* | $47M | $95M | $116M | $22M* | $33M | $138M |
| NPV cost per bus 5% | $240k* | $859k | $515k | $425k | $371k* | $584k | $492k |
| 7% Nominal Discount Rate | | | | | | | |
| NPV of costs 7% | $46M* | $52M | $104M | $127M | $19M* | $37M | $151M |
| NPV cost per bus 7% | $215k* | $952k | $564k | $465k | $317k* | $655k | $540k |
| 10.2% Nominal Discount Rate (req'd for Fed programs) | | | | | | | |
| NPV of costs 10.2% | $40M* | $54M | $108M | $131M | $16M* | $38M | $156M |
| NPV of costs per bus 10.2% | $185k* | $988k | $582k | $478k | $264k* | $686k | $556k |
| Other | | | | | | | |
| 2025 Debt service 10yr, 3% | $6.7M | $8.2M | $16.2M | $19.7M | $2.0M | $5.8M | $23.5M |
| 2025 Debt service 20yr, 3% | $3.8M | $4.7M | $9.3M | $11.3M | $1.1M | $3.4M | $13.5M |
| Added Annual Deadhead Op Cost | $0M | $0M | +$1.1M | +$1.1M | $0 | $0M | +$0.9M |
| *Includes $60M rehabilitation in 2045 CIP = Capital Improvement Program<br>NPV = Net Present Value of costs for facility life until 2050 | | | | | | | |
| Objective: House 270 buses in a primary facility, or in a primary facility with a satellite | | | | | | | |

Table 4.2-2 provides the Net Present Value of the scenario costs. Again, scenarios that use existing buildings tend to have the lowest Net Present Value of costs.

*Table 4.2-2 Net Present Value of Scenario Costs*

| | Scenario 1 | Scenario 1A | Scenario 2 | Scenario 3 | Scenario 4 | Scenario 5 | Scenario 6 | Scenario 7 |
|---|---|---|---|---|---|---|---|---|
| | Upgrade 1101 East Washington<br><br>Rent Oscar Mayer Bldgs 43 &50 | Upgrade 1101 East Washington<br><br>Buy Oscar Mayer Bldgs 43 &50 | Upgrade 1101 East Washington<br><br>Rent Oscar Mayer Bldg 43<br><br>Phased Move to Hwy 30 Site by 2033 | Small upgrade to 1101 East Washington<br><br>Rent Oscar Mayer Bldg 43 & 50<br><br>Immediate Move to Hwy 30 Site in 2024 | Upgrade 1101 East Washington<br><br>Nakoosa Satellite Facility in 2023 | Upgrade 1101 East Washington<br><br>Phased Move to Hwy 30 Site by 2033 | Upgrade 1101 East Washington<br><br>Hwy 30 Satellite - 2023 | East Facility - 2028<br><br>West Facility - 2023 |
| Net Present Value of costs 5% | $98M* | $68M* | $125M | $112M | $116M* | $125M | $88M* | $117M |
| Net Present Value of costs 7% | $83M* | $61M* | $127M | $114M | $99M* | $123M | $84M* | $121M |
| Net Present Value of costs 10.2% | $67M* | $53M* | $117M | $154M | $81M* | $112M | $76M* | $113M |

*Includes $60M rehabilitation in 2045 CIP = Capital Improvement Program
NPV = Net Present Value of costs for facility life until 2050

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# Section 5

# Facility Costs

## 5.0 Introduction

Facility costs used in this report came from three separate sources. The costs associated with renovating the 1101 East Washington Ave were obtained from preliminary design efforts (eg 30 percent) performed by Mead & Hunt. Costs associated with a phased generic Highway 30 facility were also developed by Mead & Hunt with Kueny Architects LLC and then compared with recent bid costs experienced by the City of Madison. Cost for the Nakoosa Facility were developed by MMC Consulting and Contracting and then adjusted by City staff to reflect updated needs. Costs associated with West and East satellite facilities were internally developed based on square foot costs.

## 5.1 1101 East Washington Avenue Costs (Existing Bus Facility)

The development of the program and renovation strategies started with parameters discussed with end users. Key goals and objectives included:

- Maintain functions generally within the existing footprint.
- Provide a 20-year solution for the site.
- Improve workflows by reorganizing functional adjacencies.
- Identify upgrade requirements for utilities and life safety.
- Staff safety and retention are key priorities.
- Reorganize bus traffic flow for Left-Hand turns in lieu of current Right-Hand Turns for increased safety.
- Sustainable Methods and Decreased Maintenance are a value of the City.

Through the charrette process, development of three renovation options, and continued vetting by the major stakeholders, the project team was able to develop and refine a preferred concept design, referenced as Remodeling Option 1. This option optimizes the top priorities for renovation, calling for improvements to the ventilation, safety, and toilet rooms. Remodeling Option 1 from the report is shown in Figure 5.1-1. The costs associated with Remodeling Option 1 are shown in Table 5.1-1

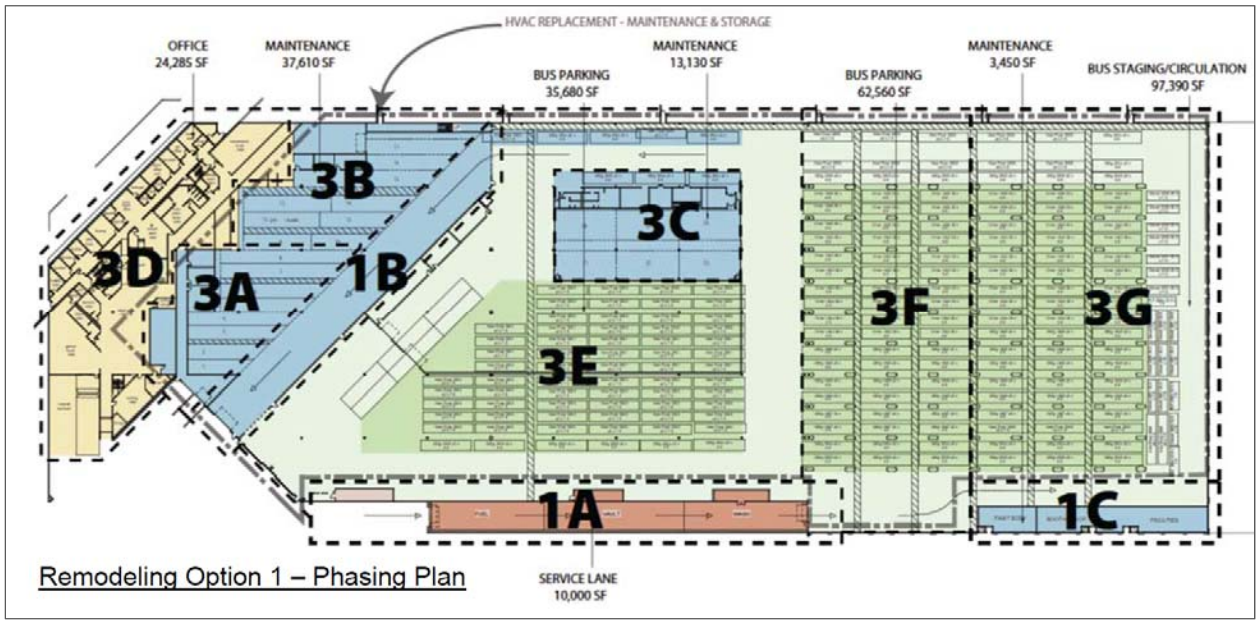


*Figure 5.1-1 1101 East Washington Ave Phasing Plan*

**Table 5.1-1 1101 East Washington Ave Facility Costs**

| Year | Phase | Description | Design | Construction | Equipment | Subtotal | CIP Total |
|---|---|---|---|---|---|---|---|
| 2018 | 1 | Design Phase 1 – • Wash bay/service lane • Fire alarm, and • Electric bus upgrades | $ 588,878 | | | $ 588,878 | $ 588,878 |
| 2019 | 1 | Phase 1 Construction | | $ 5,781,269 | $1,260,173 | $ 7,041,442 | |
| 2019 | 2 | Design Phase 2 • HVAC air units and exhaust fans • Boilers and piping • Generator to code • Interior walls for air quality | $ 711,144 | | | $ 711,144 | $ 7,752,586 |
| 2020 | 2 | Phase 2 Construction | | $ 7,227,288 | | $ 7,227,288 | |
| 2020 | 3A | Design Phase 3A (3A, B, and C from study) • Reconfigure and increase maintenance bays • Temp relocation of maintenance functions | $ 945,293 | | | $ 945,293 | $ 8,172,581 |
| 2021 | 3A | Phase 3A Construction | | $ 9,596,886 | $2,288,260 | $ 11,885,146 | |
| 2021 | 3B | Design Phase 3B – (3D from study) • Remodel driver dispatch • Remodel admin/support areas • Remodel and add bathrooms • Remodel locker rooms/gender equity | $ 887,176 | | | $ 887,176 | $ 12,772,322 |
| 2022 | 3B | Phase 3B Construction | | $ 9,006,863 | $ 450,000 | $ 9,456,863 | |
| 2022 | 3C | Design Phase 3C – (3E, F, and G from study) • Remodel bus storage • New openings and lighting • Storage mezzanine | $ 670,948 | | | $ 670,948 | $ 10,127,811 |
| 2023 | 3C | Phase 3C Construction | | $ 6,811,661 | | $ 6,811,661 | |
| 2023 | 4 | Design Phase 4 • Exterior tuckpointing • Exterior metal panels • Insulation • Landscaping • Gisholt Roof | $ 977,083 | | | $ 977,083 | $ 7,788,744 |
| 2024 | 4 | Phase 4 Construction | | $ 9,911,304 | | $ 9,911,304 | $ 9,911,304 |
| | | | | | | $ 57,114,226 | $ 57,114,226 |

## 5.2 Highway 30 Costs (Generic)

The Mead & Hunt study team used a charrette process to identify the priorities and goals with the end users for a generic green field site that could be in the Highway 30/Packers Ave area. The design team then developed a program, assessed site acreage, reviewed facility requirements, and developed initial concepts to accommodate the 40 BRT buses, 245 regular metro buses, and 28 repair bays. In order to be a feasible undertaking for the City, the project was phased into 3 separate, usable projects over 10 years.

A. Project Phasing

The project phasing and program used for this analysis is as follows:

> Phase I – This includes building a 57,100 SF bus repair garage and an additional 118,611 SF bus repair space to be used temporarily to store 15 BRT's and 40 regular buses. Eventually the combined 175,711 SF could be used solely for (28) 24'x80' service repair bays. Only (6) of the eventual 28 bays would be equipped at this time with capital equipment i.e. hoists and product distribution lines. This initial phase also planned for 11,969 SF of dispatch and parts support space and a 7,320 SF two lane service island equipped with wash, fuel, vault and vacuum

services. Only one of the two lanes would be equipped in this phase. The total cost of the new 195,000 SF is $51.8 million (in 2025 dollars).

Phase II – This phase includes building an additional 236,165 SF bus garage housing 120 regular and 10 BRT buses. At the same time, the office support core would be built consisting of 8,545 SF. Upon completion of the storage garage, buses would relocate into their new spaces allowing the bus repair space to be fitted with (12) additional hoists, lubrication lines etc. totaling 20 repair bays by year 2030 at a cost of an additional $71.3 million (in 2030 dollars).

Phase III – This phase would build an additional 95,035 SF of bus storage for 85 regular and 15 BRT buses and could be implemented in the year 2035. Upon relocating these buses into their new space, the final (8) repair bays would become available to be fitted with hoists and the necessary capital equipment completing the 28 service repair bay requirement and parking for 245 regular and 40 BRT buses at a 2035 cost of $35 million (in 2035 dollars).

B. Cost Analysis Understanding and Next Steps

A review of the cost estimate will show that the cost per square foot is higher than the average facility. For example, an RS Means Square Foot Cost Estimate Report of a similar Facility Type of Bus Terminal with Precast Concrete/Bearing Walls lists a cost of $147.29/sf. Costs from the Mead & Hunt study range between $204 and $223 per square foot without equipment. Part of the reason for the increased costs lies with the following:

- The need for phased construction and rework required for each subsequent phase. Building one facility at one time would create capital costs, exceeding $130 million that would be difficult for the City to absorb.
- Most sites of this scale within the City limits lie on challenged soils. A higher site-work and foundations cost per square foot was utilized as a conservative approach, equating to $30/sf.
- City of Madison requirements for mechanical, electrical, technological and sustainable infrastructure items, as well as urban design elements increase project costs.
- A design contingency of 20 percent was included to account for future scope unknowns.
- City of Madison recent building experience shows higher per square foot costs. The following list shows recently completed projects and costs, without management or design costs.

| Year | Project | Bldg Size sf | Const Cost | Cost/sf |
|---|---|---|---|---|
| 2017 | Madison Municipal Bldg | 75,000 | $21.7M | $289.90 |
| 2017 | Fire Station No 14 | 19,200 | $6.4M | $332.78 |
| 2017 | Midtown Police (est) | 31,000 | $7.7M | $247.66 |
| 2017 | Nakoosa Trail Fleet (est) | 105,000 | $25.5M | $242.91 |
| 2017 | Capital East Garage | 248,000 | $14.3M | $57.55 |
| 2017 | Judge Doyle Garage | 244,000 | $30.0M | $122.6 |
| 2016 | Library Support | 18,000 | $3.2M | $179.78 |

C. Cost Estimate

Figure 5.2-1 summarizes the cost estimate for the generic phased Highway 30 facility.

| | | | 2018 Construction | Construction w/ Escalation | Square Footage |
|---|---|---|---|---|---|
| **2025** | **Phase 1** | | | | |
| | Bus Maintenance | | $12,457,452 | $15,321,094 | 57,100 |
| | Dispatch/Support | | $2,561,755 | $3,150,636 | 11,969 |
| | Bus Storage | | $19,025,540 | $23,399,014 | 118,611 |
| | Service Lane | | $1,640,255 | $2,017,307 | 7,320 |
| | Construction Total | | $35,685,002 | $43,888,052 | |
| | Contingency | 8% | $2,854,800 | $3,511,044 | |
| | A/E Fees | 10% | $3,568,500 | $4,388,805 | |
| | **PROJECT TOTAL** | | **$42,108,303** | **$51,787,901** | |
| | | | | | New SF |
| | Equipment | | $2,318,418 | $2,851,362 | 195,000 |
| **2030** | **Phase 2** | | | | |
| | Bus Maintenance Renovation | | $2,694,182 | $3,841,260 | 56,000 |
| | Dispatch/Support | | $1,840,760 | $2,624,483 | 8,545 |
| | Bus Storage | | $37,867,847 | $53,990,495 | 236,165 |
| | Construction Total | | $42,402,789 | $60,456,239 | |
| | Contingency | 8% | $3,392,223 | $4,836,499 | |
| | A/E Fees | 10% | $4,240,279 | $6,045,624 | |
| | | | | | New SF |
| | **PROJECT TOTAL** | | **$50,035,291** | **$71,338,362** | 244,710 |
| | | | | | Renovate SF |
| | Equipment | | $1,741,212 | $2,482,552 | 56,000 |
| **2035** | **Phase 3** | | | | |
| | Bus Maintenance Renovation | | $2,694,182 | $4,453,073 | 56,000 |
| | Bus Storage | | $15,246,628 | $25,200,352 | 95,035 |
| | Construction Total | | $17,940,810 | $29,653,425 | |
| | Contingency | 8% | $1,435,265 | $2,372,274 | |
| | A/E Fees | 10% | $1,794,081 | $2,965,343 | |
| | | | | | New SF |
| | **PROJECT TOTAL** | | **$21,170,156** | **$34,991,042** | 95,035 |
| | | | | | Renovate SF |
| | Equipment | | $1,086,000 | $1,794,993 | 56,000 |
| | | | | | Total SF |
| **TOTALS** | | | **$113,313,750** | **$158,117,304** | 534,745 |
| Equipment Totals | | | $5,145,630 | $7,128,906 | Site Acreage 25 Acres |

Note: Escalation compounded annual inflation interest rate of 3%

*Figure 5.2-1 Highway 30 Facility Cost Estimate from Mead & Hunt study*

## 5.3 Nakoosa Satellite Facility

The City has applied for several TIGER grants to assist in the construction of the facility. This entailed both developing design concepts and obtaining preliminary estimates. Figure 5.3-1 shows the construction cost estimate prepared by MMC Consulting and Contracting.

MCC Consulting & Contracting

**CITY OF MADISON**
**NAKOOSA TRAIL**
**Bus Garage Maintenance Facility**
**Summary**

SD Estimate
04/25/2018
**Rev 04**

| | COST SUMMARY | 194,097 GSF | $/SF | BUILDING TOTAL |
|---|---|---|---|---|
| 01000 | GENERAL REQUIREMENTS | | $0.00 | $0 |
| 02000 | EXISTING CONDITIONS | | $0.00 | $0 |
| 03000 | CONCRETE | | $45.98 | $8,923,784 |
| 04000 | MASONRY | | $4.57 | $887,063 |
| 05000 | METALS | | $7.79 | $1,511,513 |
| 06000 | WOODS, PLASTICS & COMPOSITES | | $0.66 | $128,834 |
| 07000 | THERMAL & MOISTURE PROTECTION SYSTEM | | $18.49 | $3,589,075 |
| 08000 | OPENINGS | | $3.65 | $709,198 |
| 09000 | FINISHES | | $5.47 | $1,060,986 |
| 10000 | SPECIALTIES | | $0.57 | $110,597 |
| 11000 | EQUIPMENT-BELOW THE LINE | | $0.00 | $0 |
| 12000 | FURNISHINGS | | $0.00 | $0 |
| 13000 | SPECIAL CONSTRUCTION | | $0.00 | $0 |
| 14000 | CONVEYING EQUIPMENT | | $0.72 | $139,964 |
| 21000 | FIRE SUPPRESSION | | $2.65 | $514,338 |
| 22000 | PLUMBING | | $5.35 | $1,038,767 |
| 23000 | HEATING, VENTILATING & AIR CONDITIONING | | $23.43 | $4,547,057 |
| 26000 | ELECTRICAL | | $20.23 | $3,926,582 |
| 27000 | COMMUNICATIONS | | $1.40 | $271,736 |
| 28000 | ELECTRONIC SAFETY AND SECURITY | | $1.40 | $271,736 |
| 31000 | EARTHWORK | | $13.51 | $2,622,161 |
| 32000 | EXTERIOR IMPROVEMENTS | | $3.34 | $649,213 |
| 33000 | UTILITIES | | $1.03 | $200,000 |
| | **SUBTOTAL** | | **$160.24** | **$31,102,604** |
| | ESCALATION TO START OF CONSTRUCTION SUMMER 2020 | 7.5% | $12.02 | $2,332,695 |
| | GENERAL CONDITIONS/BOND/INSURANCE | 4.0% | $6.89 | $1,337,412 |
| | CONTRACTOR'S FEES | 4.5% | $8.06 | $1,564,772 |
| | DESIGN CONTINGENCY | 5.0% | $9.36 | $1,816,874 |
| | 8% BPW CONSTRUCTION CONTINGENCY | 8.0% | $15.73 | $3,052,349 |
| | **TOTAL ESTIMATED CONSTRUCTION COSTS** | | **$212.30** | **$41,206,706** |
| | **Alternate #1 Add to Utilize Post Tensioning in Lieu of Precast** | | | **$1,219,765** |
| | **Alternate #2 Supply and Install Maintenance Equipment** | | | **$5,385,381** |
| | **Alternate #3 Photovoltaic Panels and Support Framing- After Grants** | | | **$1,930,830** |
| | **Alternate #4 Bus Charging Stations** | | | **$900,000** |
| | **Alternate #5 1500KW Generator Set** | | | **$330,099** |
| | **Alternate #6 In Floor Heating at Service and Maintenance** | | | **$236,826** |
| | **TOTAL ESTIMATED PROJECT COSTS** | | **$263.84** | **$51,209,607** |

*Figure 5.3-1 Nakoosa Trail Satellite Facility Cost Estimate from MCC Consulting and Contracting*

## 5.4 East and West Satellite Facility

As mentioned, City staff internally developed conceptual costs for an east and west satellite facility. These costs are in-line with the square foot costs developed for the other facilities. Table 5.4-1 summarizes these costs. If scenarios using both a west and an east satellite facility show promise, more refined estimates could be developed.

**Table 5.4-1 West and East Satellite Facility Costs**

| West Satellite | Number | Unit/sf | Cost per unit | | Total |
|---|---|---|---|---|---|
| Maintenance Bays | 14 | 1700 | $ 225 | $ | 5,355,000 |
| BRT Buses | 20 | 2400 | $ 225 | $ | 10,800,000 |
| Reg Buses | 120 | 1675 | $ 225 | $ | 45,225,000 |
| Buswash | 1 | Each | $ 4,000,000 | $ | 4,000,000 |
| Office/other | 15200 | 15200 | $ 180 | $ | 2,736,000 |
| Site Work | 1 | Each | $ 1,100,000 | $ | 1,100,000 |
| Total | | | | $ | 69,216,000 |
| Contingency | | | 15% | $ | 10,382,400 |
| Design | | | 8% | $ | 5,537,280 |
| | | | | $ | 85,135,680 |

| East Satellite | Number | Unit/sf | Cost per unit | | Total |
|---|---|---|---|---|---|
| Maintenance Bays | 14 | 1700 | $ 225 | $ | 5,355,000 |
| BRT Buses | 25 | 2400 | $ 225 | $ | 13,500,000 |
| Reg Buses | 120 | 1675 | $ 225 | $ | 45,225,000 |
| Buswash | 1 | Each | $ 4,000,000 | $ | 4,000,000 |
| Office/other | 14000 | 14000 | $ 180 | $ | 2,520,000 |
| Site Work | 1 | Each | $ 1,100,000 | $ | 1,100,000 |
| Total | | | | $ | 71,700,000 |
| Contingency | | | 15% | $ | 10,755,000 |
| Design | | | 8% | $ | 5,736,000 |
| | | | | $ | 88,191,000 |

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# Section 6

# Evaluation and Recommendation

## 6.0 Evaluation Summary

The scenarios were evaluated using the critical and other needs discussed in Section 1 of this report. The matrix shown in Table 6.0-1 summarizes these needs. All scenarios satisfy the critical needs of worker and driver safety, ability to accommodate BRT and electric buses, and provide sufficient bus storage.

In the other need category, the scenarios vary considerably. Generally, alternatives that use an existing facility, such as scenarios 1 and 1A which use 1101 East Washington Ave and Oscar Mayer, have lower capital costs, debt service, and Net Present Value of costs. Therefore these two are more feasible expenditures from both a capital and operating cost perspective. Scenarios 2 through 7 provide much higher capital costs, Net Present Value of costs, and the corresponding operating cost of debt service. Generally, scenarios that use new construction for bus housing become less feasible in proportion to the number of buses they accommodate.

Scenarios that involve relocating all operations from the 1101 East Washington Ave facility generally have higher annual operating costs resulting from deadhead and driver relief trips. This includes Scenarios 2, 3, 5, and 7, which eventually build a full facility near the Highway 30/Packers Ave intersection or create east and west facilities.

In the desires category, all scenarios except Scenario 1, which rents Oscar Mayer, have the ability to meet a portion of the local match requirement of an FTA Small Starts grant. All scenarios, except Scenario 1 (rent Oscar Mayer) and Scenario 4 (Nakoosa Satellite) provide the opportunity to relocate from 1101 East Washington Ave in the future, if at some point in the future the City wants to pursue that option. And all scenarios, except for Scenario 1 which rents Oscar Mayer, give the City control of the property beyond the 30 year analysis period.

## 6.1 Recommendations

This study recommends Scenario 1A, which includes:

- Continuing to use, and investing in, 1101 East Washington Ave as the primary facility for Metro operations.
- Purchasing the Oscar Mayer site and using it as a satellite facility.

This recommendation has:

- The lowest capital expenditure and corresponding debt service.
- The lowest net present value of costs.
- No increase in operating (deadhead) costs.
- The ability to count towards FTA Small Starts local match.
- The lowest housing cost per bus.
- Preserves the ability to relocate all, or a portion of Metro's operations from the 1101 East Washington Ave facility.

Current conditions provide the opportunity to cost-effectively address bus storage capacity and a key recommendation in current planning documents. Consequently this study further recommends negotiating with the owners of the Oscar Mayer facility to purchase Buildings 43 and 50 with the north 15 acres of the site.

**Table 6.0-1 Scenario Matrix**

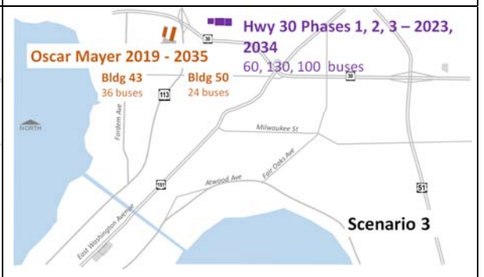
| | **Scenario 1**<br>• Upgrade 1101 East Washington Phases 1-4<br>• Rent Oscar Mayer Bldgs 43 & 50 | **Scenario 1A**<br>• Upgrade 1101 East Washington Phases 1-4<br>• **BUY** Oscar Mayer Bldgs 43 & 50 | **Scenario 2**<br>• Upgrade 1101 East Washington Phases 1-3b 2019-2023<br>• Rent Oscar Mayer Bldg 43 until 2030<br>• Phased move to Hwy 30, 2023, 2028, 2032 | **Scenario 3**<br>• Very small upgrade to 1101 East Washington<br>• Rent Oscar Mayer Bldgs 43 & 50 until 2035<br>• Immediate move to Hwy 30, 2023 |
|---|---|---|---|---|
| |  |  |  |  |
| **Critical Needs** | | | | |
| Driver and Worker Safety | Yes | Yes | Yes | Yes |
| Accommodate BRT & Electric Buses | Yes | Yes | Yes | Yes |
| Bus Storage | Yes | Yes | Yes | Yes |
| **Other Needs** | | | | |
| Feasibility – CIP 2019-2028 | $64M | $73M | $204M | $161M |
| Feasibility – CIP 2019-2040 | $64M | $73M | $246M | $206M |
| | | | | |
| Feasibility – Debt Service 2025 (10yr) | $7.5M | $8.5M | $13.8M | $19.0M |
| Feasibility – Debt Service 2030 (10yr) | $4.9M | $5.8M | $21.8M | $19.0M |
| | | | | |
| Cost Eff - NPV of Costs 5% (real) | $98M* | $68M* | $125M | $112M |
| Cost Eff - NPV of Costs 7% (real) | $83M* | $61M* | $127M | $114M |
| Cost Eff - NPV of Costs 10.2% (real) | $67M* | $53M* | $117M | $105M |
| | | | | |
| Cost Eff - Increase in Annual Deadhead Costs | $0 | $0 | +$1.1M | +$1.1M |
| **Desires** | | | | |
| Satisfy FTA local match | No | Yes | Yes | Yes |
| Preserves ability to fully relocate from 1101 East Washington Ave in future | No | Possibly | Yes | Yes |
| Provides control of property | No | Yes | Yes | Yes |
| **Intangibles** | | | | |
| Property currently available? | NA | Yes | No | No |
| **Commentary** | | | | |
| | • Renting requires a site-specific infrastructure investment and does not guarantee continued use after initial term.<br>• Renting does not allow this investment to count towards local match for FTA grant. | • In almost every category this Scenario provides the most favorable evaluation.<br>• This Scenario satisfies criteria with:<br>o The lowest capital expenditure and corresponding debt service<br>o Lowest net present value of costs.<br>o No increase in operating (deadhead) costs.<br>o Can count toward FTA Small Starts local match.<br>• This scenario may allow full relocation of operations from 1101 East Washington if desired in the future. | • Because rental properties are used, this scenario requires site specific infrastructure investment that will be lost once rental period expires.<br>• The high costs associated with fully relocating operations from the 1101 East Washington facility places a burden on the Capital Budget.<br>• The full relocation of operations to a Highway 30 facility increases annual operating costs associated with deadheading. | • The high costs associated with fully relocating operations from the 1101 East Washington facility places a burden on the Capital Budget.<br>• Because rental properties are used, this scenario requires site specific infrastructure investment that will be lost once rental period expires.<br>• The full relocation of operations to a Highway 30 facility increases annual operating costs associated with deadheading. |

**Table 6.0-1 Scenario Matrix (cont)**

| | Scenario 4<br>• Upgrade 1101 East Washington Phases 1-4 2019-2023<br>• Build Nakoosa Satellite 2023 | Scenario 5<br>• Upgrade 1101 East Washington Phases 1-3b<br>• Phased move to Hwy 30, 2023, 2028, 2032 | Scenario 6<br>• Upgrade 1101 East Washington Phases 1-4<br>• Satellite facility (could be Hwy 30) - 2023 | Scenario 7<br>• Upgrade 1101 East Washington Phases 1-2<br>• East Satellite Facility – 2028<br>• West Satellite Facility - 2023 |
|---|---|---|---|---|
| |  |  |  |  |
| **Critical Needs** | | | | |
| Driver and Worker Safety | Yes | Yes | Yes | Yes |
| Accommodate BRT & Electric Buses | Yes | Yes | Yes | Yes |
| Bus Storage | Yes | Yes | Yes | Yes |
| **Other Needs** | | | | |
| Feasibility – CIP 2019-2028 | $112M | $202M | $115M | $267M |
| Feasibility – CIP 2019-2040 | $112M | $244M | $115M | $267M |
| | | | | |
| Feasibility – Debt Service 2025/yr | $13.1M | $13.5M | $13.4M | $15.8M |
| Feasibility – Debt Service 2030/yr | $11.2M | $21.9M | $11.6M | $29.4M |
| | | | | |
| Cost Eff - NPV of Costs 5% (real) | $116M* | $125M | $88M | $117M |
| Cost Eff - NPV of Costs 7% (real) | $99M* | $123M | $84M | $121M |
| Cost Eff - NPV of Costs 10.2% (real) | $81M* | $112M | $76M | $113M |
| | | | | |
| Cost Eff – Increase in Op Costs Deadhead | $0 | +$1.1 | +$0.2M | +$0.9M |
| **Desires** | | | | |
| Satisfy FTA local match | Yes | Yes | Yes | Yes |
| Preserves ability to fully relocate from 1101 East Washington Ave in future | No | Yes | Possibly | Yes |
| Provides control of property | Yes | Yes | Yes | Yes |
| **Intangibles** | | | | |
| Property currently available? | Yes | No | No | No |
| **Commentary** | | | | |
| | • This scenario burdens the Capital Budget, yet not as much as scenarios that fully relocate operations from 1101 East Washington.<br>• The City of Madison owns the land needed for 1101, so it remains an option that could be pursued if other more attractive scenarios are impeded. | • The high infrastructure costs associated with the phased move from the 1101 East Washington facility places a burden on the Capital Budget.<br>• The location increases annual operating costs associated with deadheading. | • This scenario places more reasonable burdens on the Capital Budget because it does not fully relocate operations from the 1101 East Washington facility.<br>• This scenario provides a very modest increase in operating costs associated with deadheading. | • In theory an east and west base facility appears to be efficient, yet operation costs associated with deadheading increases.<br>• This scenario, with the construction of two totally new facilities, places a large burden on the Capital Budget. |