

How Much Do I Really Need?

Establishing a Realistic Budget for a Bus Operations and Maintenance Facility

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We always hear that...

A successful and functional design hinges on:

1. The Owners ability to secure the appropriate budget and to convey the needs of their organization.
2. The Design Team's approach and their ability to include the facility users in the design process
3. Real COLLABORATION



Reality suggests...

You can't design or construct a new facility without funding... and you can't get funding without a first establishing your needs or a realistic budget.

What are the key elements of a good budget?



Key Elements of a Preliminary Budget

The Preliminary Budget should include:

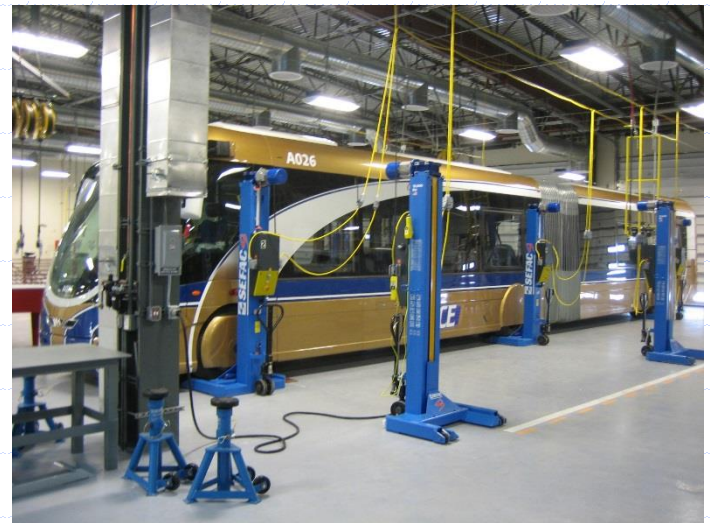
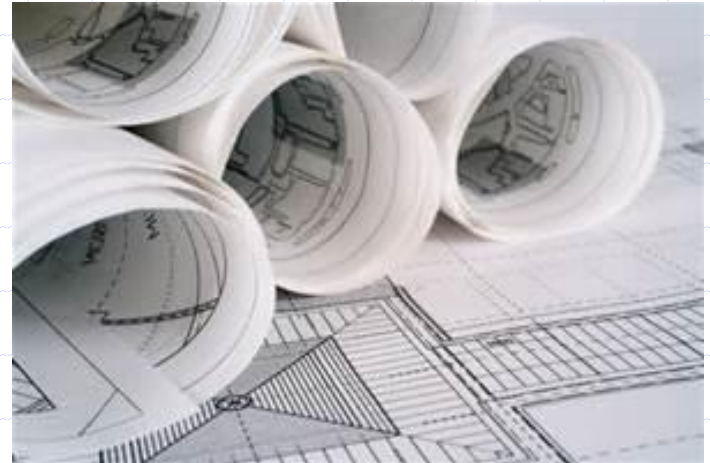
- **Hard Costs**

- (Construction Costs) and Maintenance Equipment

- **Soft Costs**

- Land Acquisition Costs (Land and Fees)
- Design Fees
- Special Permitting, Survey and Environmental Work/Reports Costs
- Internal Administrative Costs

- **Contingency**



Project Funding



Things to Consider:

- Identification of potential Funding Sources
 - Grants and Federal Funding
 - Developer Funded
- Consider Project Delivery Methods
 - Design/Bid/Build
 - Construction Manager/General Contractor (CMGC)
 - Construction Manager at Risk (CMAR)
 - Design/Build
 - Developer Funded – Build to Suit



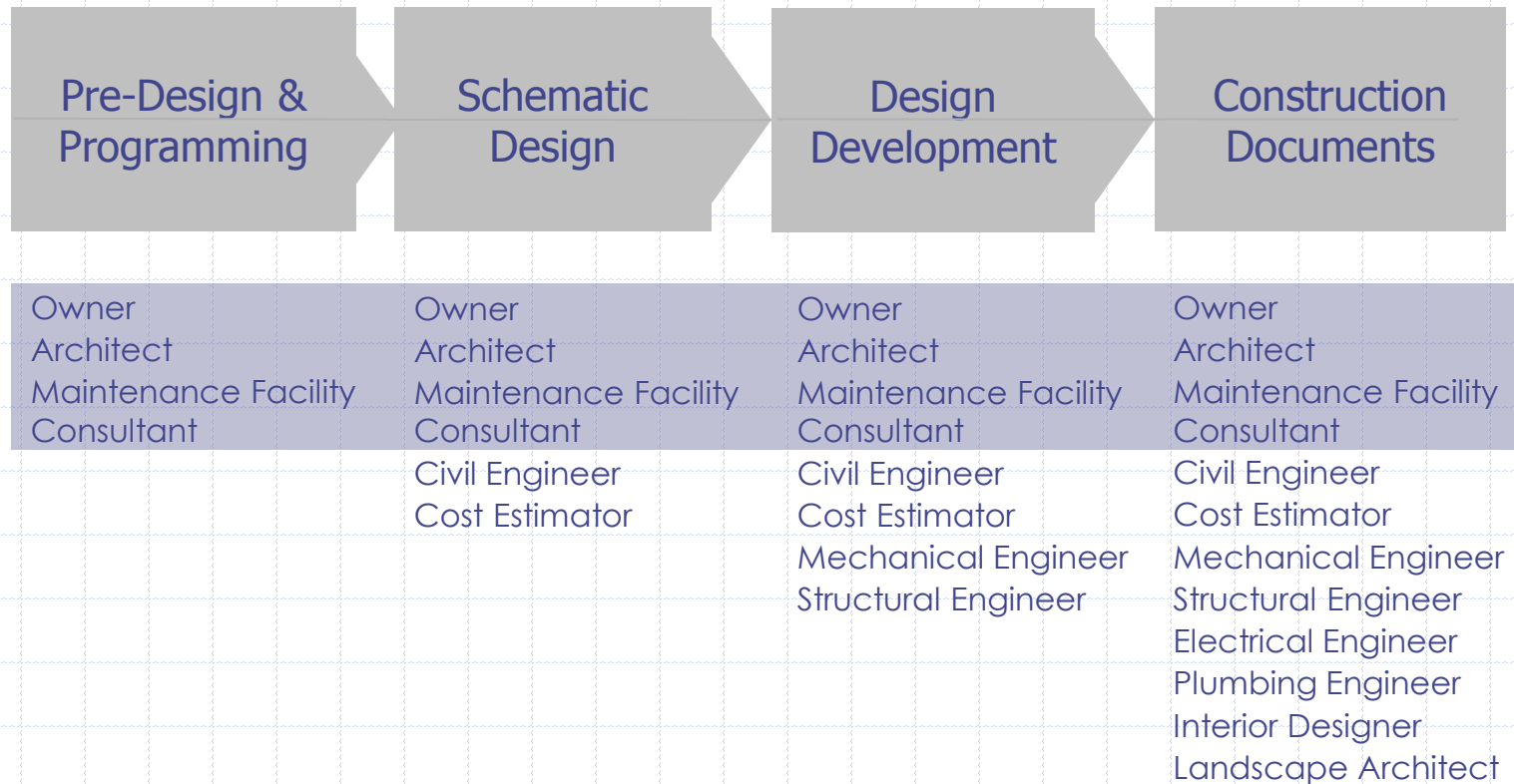
Construction Process

Things to Consider:

- What will be your Construction Management & Administration Approach?
 - Consider the impact on your time – on your staff's time?
 - What is the real cost of that involvement – or lack of that involvement?
- Disruption of Operations
- Have a Move-in Plan
- Facility Maintenance Plan



Involvement of Disciplines



Design Phases

Pre-Design & Programming

Existing Facility Assessment
Maintenance Methods
Affinities
Fleet Growth
Staffing Projections
Space Programs
Fleet Design Data
Key Design Issues
Design Criteria
Site Investigation
Preliminary Estimate/
Budget

Schematic Design

Master Plans
Site Layouts
Parking Configuration
Facility Layouts
Workstation Locations
Materials Selection
Initial System Design
Updated Preliminary Estimate/Budget

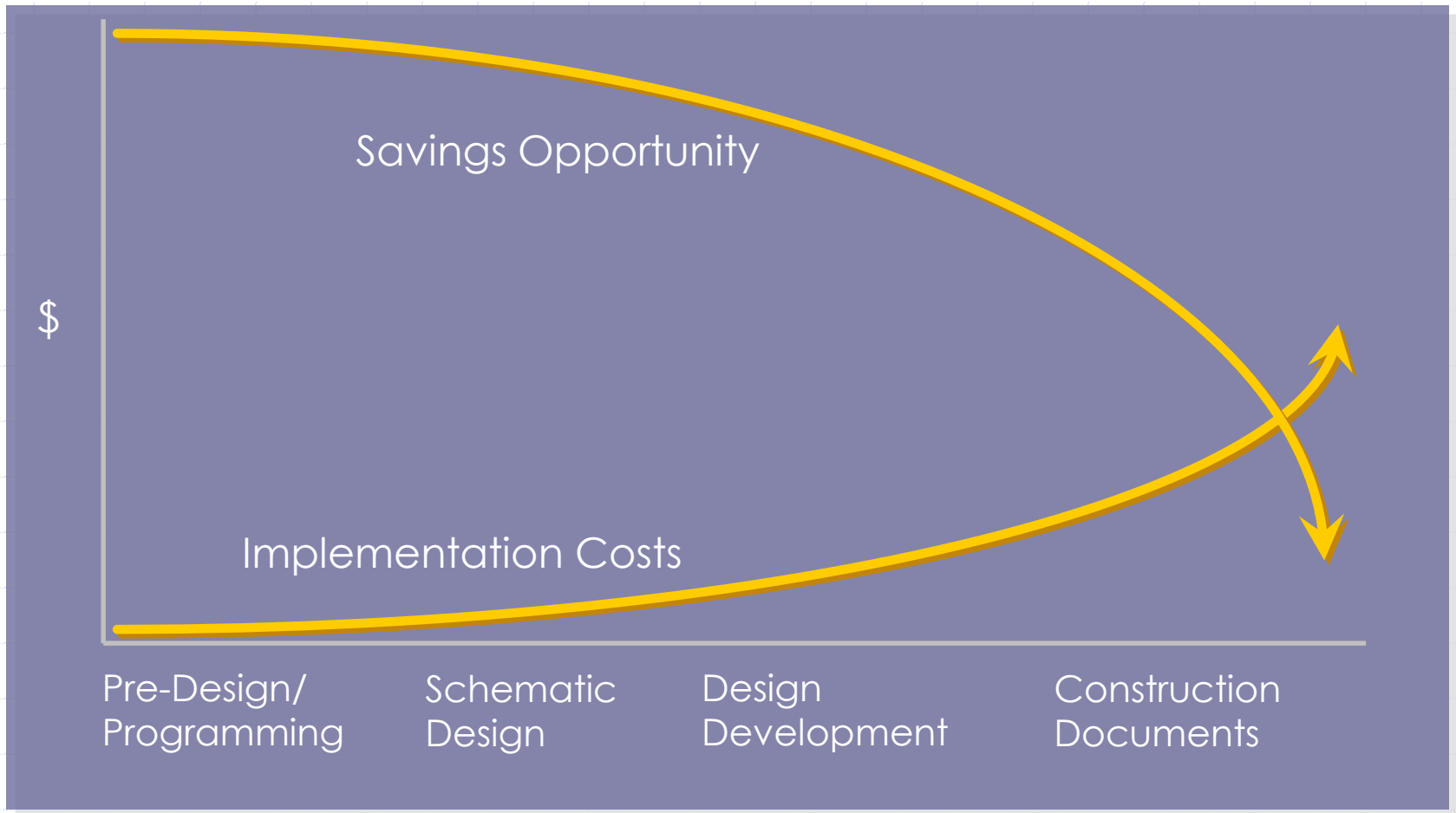
Design Development

Drawing Development
Systems Detail Design
System Specs Development
Code Review
Equipment Specs
Equipment Layouts
Utility Requirements
Color Selection
Estimate Update

Construction Documents

Drawings Finalized
Specs Finalized
Plan Review
Signage and Graphics
Final Estimate

When to Influence Design (and Budget)



✓ Facility Planning Checklist

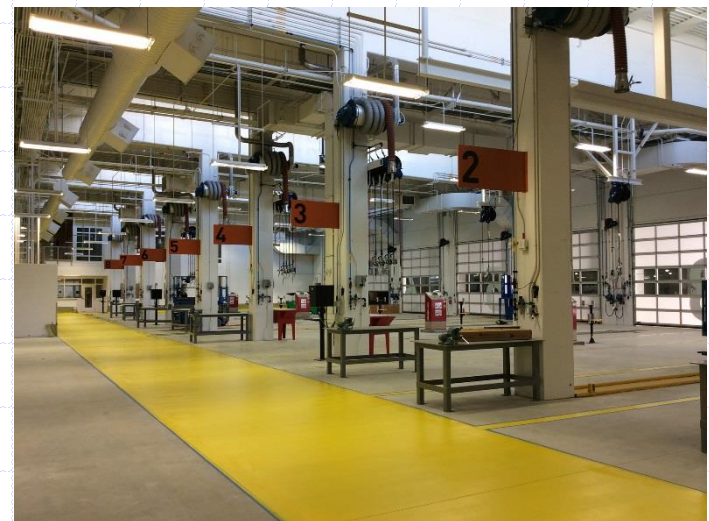
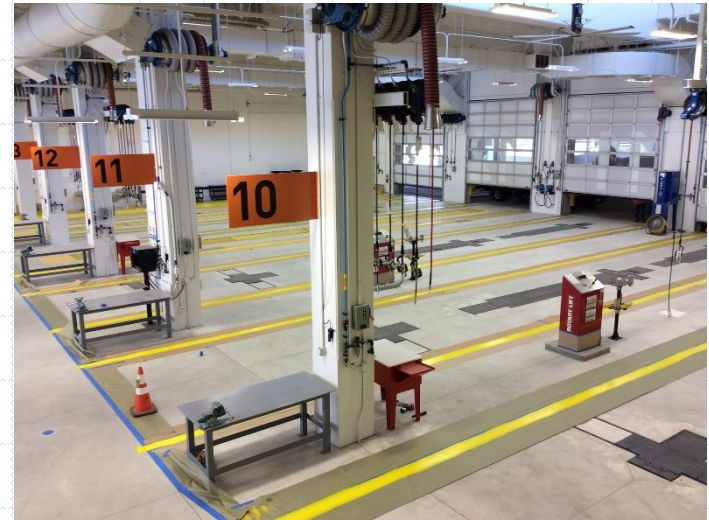
Operations Areas

- ☐ Offices and Functional Relationships
- ☐ Drivers' Room Requirements
- ☐ Kitchenette and Vending
- ☐ Quiet Room(s)
- ☐ Dispatch Suite and Dispatch Vestibule
- ☐ Restrooms (for Drivers)
- ☐ Training Facilities
- ☐ Table/Chair and Training Storage
- ☐ Fitness Rooms
- ☐ Lockers & and Genderless Locker Alcove for Drivers



✓ Facility Planning Checklist

- ☐ Floor Surfaces/Coverings
- ☐ Lighting and natural light
- ☐ HVAC Systems
- ☐ Radio Systems
- ☐ IT Requirements
- ☐ Parking Configurations
- ☐ Site Circulation
- ☐ Dispatch Suite Design - View of Buses from Dispatch (CCTV's)?; AVL systems; Yard Mapping
- ☐ Service Cycle Design (Fuel, Interior Cleaning, Fare Retrieval, and Bus Wash)
- ☐ Fare Retrieval Approach



✓ Facility Planning Checklist

Maintenance Areas

- ☐ High Performance Floor Surfaces
- ☐ Lighting – Bay and Shops
- ☐ Waste Oil and Coolant Recovery
- ☐ Central Lubrication Distribution Systems
- ☐ Vehicle Lift Technology
- ☐ Lower Level Work Areas (Pits)
- ☐ Interior Clearances
- ☐ Parts Rooms and Warehouses
- ☐ Functional Column Locations (going to have them – where do you put them)
- ☐ Vehicle Exhaust Systems



☒ Facility Planning Checklist

- ☐ Bay Configuration – Artics?
- ☐ Specialty Shops, Common Work Areas, and Portable Equipment Storage
- ☐ Battery Room Requirements
- ☐ Mechanics Lunch/Break Facilities
- ☐ Mechanics Restrooms and Lockers
- ☐ Half Height Walls in Maintenance
- ☐ Compressed Air and Lubrication Distribution Systems
- ☐ Bus Roof Access (Cranes, Platforms, Fall Protection)
- ☐ Paint and Body
- ☐ Bus Parking Configurations
- ☐ Exterior Amenities

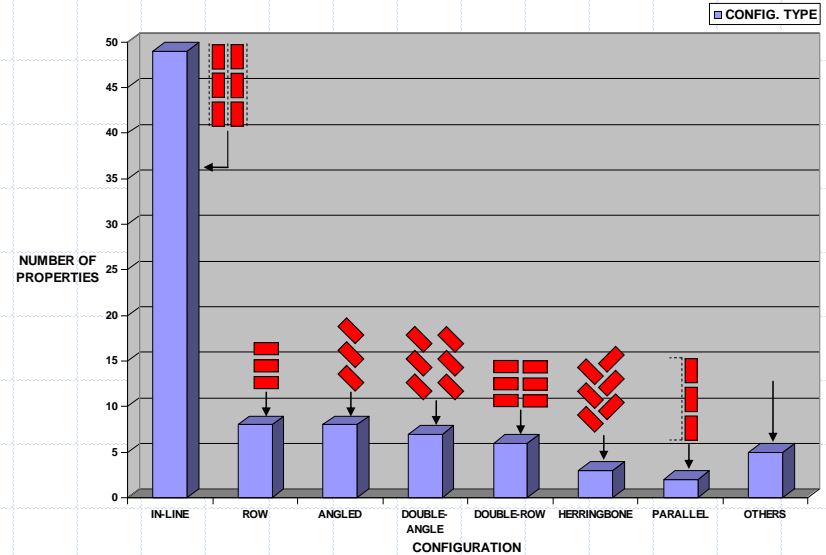


Parking Configurations

Things to Consider:

- Turning Clearances
- Angled vs. 90 Degrees
- Agency Parking
 - Interior Parking
 - Canopy Parking
 - Exterior Parking
- Employee Parking
- Lighting (Poles)
- Access Control & Security

EXHIBIT -4
STORAGE PRACTICE



CONFIGURATION	IN-LINE	ROW	DOUBLE-ROW	ANGLED	DOUBLE-ANGLED		HERRINGBONE	
					(B)	(C)	(D)	(E)
SPECIFICATION								
BUSES PER ROW	12	50	84	42	84	64	84	84
NUMBER OR ROWS	24	5	3	6	3	4	3	3
LENGTH OF ROW (FT.)	504	600	504	736	748	578	745	745
WIDTH OF ROW (FT.)	12	42	84	39	68	68	71	71
NUMBER OF AISLES	0	6	4	7	4	5	4	4
WIDTH OF AISLES (FT.)	0	55	55	45	45	45	45	20
TOTAL WIDTH (FT.)	288	540	472	549	384	497	393	293
AREA (A)								
SQUARE FEET	145,152	324,000	237,888	404,064	287,232	287,266	292,785	218,285
ACRES	3.33	7.43	5.46	9.28	6.59	6.59	6.72	5.01
BUS CAPACITY	252	250	252	252	252	256	252	252
AREA PER BUS (SQ. FT.)	576	1,296	944	1,603	1,140	1,122	1,162	866
FLEXIBILITY	POOR	EXCELLENT	GOOD	EXCELLENT	GOOD	GOOD	GOOD	FAIR/POOR
MANEUVERABILITY	GOOD	FAIR	FAIR	GOOD	GOOD	GOOD	FAIR	FAIR

☒ Budget Checklist

☐ Land Acquisition

- Site Selection – Understand your acquisition process
- Understand the requirements and levels required for Environmental Clearances
- Factor in the time to close

☐ Establishing the Final Budget

- Adjust to accommodate a reasonable "Regional Factor"?
- Understand how the state of the Construction Market - now and when you project your facility to be potentially be Constructed.
- Include Agency Administrative Time

☐ Does the Design Scope cover all aspects of your needs? Does your Budget?

- Furniture & Maintenance Equipment
- Utility Tie-ins & other off-site Improvements
- Construction Administration
- Warranty follow-up



✓ Project Delivery

□ Project Deliver Approach

- Design/Bid/Build
- Construction Manager/General Contractor (CMGC)
- Construction Manager at Risk (CMAR)
- Design/Build
- Developer Funded – Build to Suit

Do your research –
understand your options and
the Pros/Cons of each
approach.



Previous Efforts

2011 – APTA Report

1. Facilities Working Group developed a “Recommended Practice: titled: Architectural and Engineering Design for a Transit Operating and Maintenance Facility. (APTA BTS-BMF-RP-001-11)
2. Provided a Basic Facility Calculator.



APTA STANDARDS DEVELOPMENT PROGRAM
RECOMMENDED PRACTICE
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Bus Maintenance Facility Working Group

Architectural and Engineering Design for a Transit Operating and Maintenance Facility

Abstract: This *Recommended Practice* provides the steps necessary to implement a new bus transit facility project and an example of a scope of services procurement document for the basic architectural and engineering services needed to assist the agency in the design, engineering and construction of a new transit facility.

Keywords: architectural and engineering, bus transit facility, construction, RFP, scope of service

Scope and purpose: This document is intended as a resource to provide the basic scope information needed as part of a request for proposal (RFP) procurement.

This Recommended Practice represents a common viewpoint of those parties concerned with its provisions, namely, transit operating/planning agencies, manufacturers, consultants, engineers and general interest groups. The application of any standards, practices or guidelines contained herein is voluntary. In some cases, federal and/or state regulations govern portions of a transit system's operations. In those cases, the government regulations take precedence over this standard. APTA recognizes that for certain applications, the standards or practices, as implemented by individual transit agencies, may be either more or less restrictive than those given in this document.

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The Facility Calculator

Why Give the Facility Calculator Away?
– Isn't this what you do for a living?

Yes – But it is **not what you do** and often times you have to do this.

We believe that an informed and prepared owner - armed with a realistic project budget is **better for everyone** – your organization, the tax payers, and the design professionals you may engage.

The Facility Calculator

3 Easy Steps:

1. Enter Fleet Information
2. Enter Facility Options
3. Review and Adjust



- Excel® Spreadsheet – Limited data entry requirements
- Data Entry based on your specific facility needs.
- Costs are calculated on a Per Square Foot (SF) basis and are based on typical, durable, and sustainable materials and appropriate and modern systems and equipment.
- Fully Adjustable and Customizable – you own it!

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