How Much Do I Really Need?
Establishing a Realistic Budget for a Bus Operations and Maintenance Facility

Mark Ellis, Central Region Manager | Houston, Texas
We always hear that...a successful and functional design hinges on

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

- Owner
- Architect
- Maintenance Facility Consultant

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- Maintenance Facility Consultant
- Civil Engineer
- Cost Estimator

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- Structural Engineer

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- Civil Engineer
- Cost Estimator
- Mechanical Engineer
- Structural Engineer
- Electrical Engineer
- Plumbing Engineer
- Interior Designer
- Landscape Architect
Design Phases

1. 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

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

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

4. Construction Documents
   - Drawings Finalized
   - Specs Finalized
   - Plan Review
   - Signage and Graphics
   - Final Estimate
When to Influence Design (and Budget)

- Savings Opportunity
- Implementation Costs

Pre-Design & Programming  Schematic Design  Design Development  Construction Documents
Facility Planning Checklist

Operations Areas
- Offices and Functional Relationships
- Drivers’ Room Requirements
- Kitchenette and Vending
- Quite 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

Operations Areas

- 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

Maintenance Areas

- 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
  - Employee Parking
  - Lighting (Poles)
  - Access Control & Security
  - Agency Parking
    - Interior Parking
    - Canopy Parking
    - Exterior Parking

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

- Chart showing the number of properties by configuration type.
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
  - Provided a Basic Facility Calculator
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:
  - Enter Fleet Information
  - Enter Facility Options
  - 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!