



# Transit Facilities

*Moving from Concept to Construction*



Kimley»»Horn

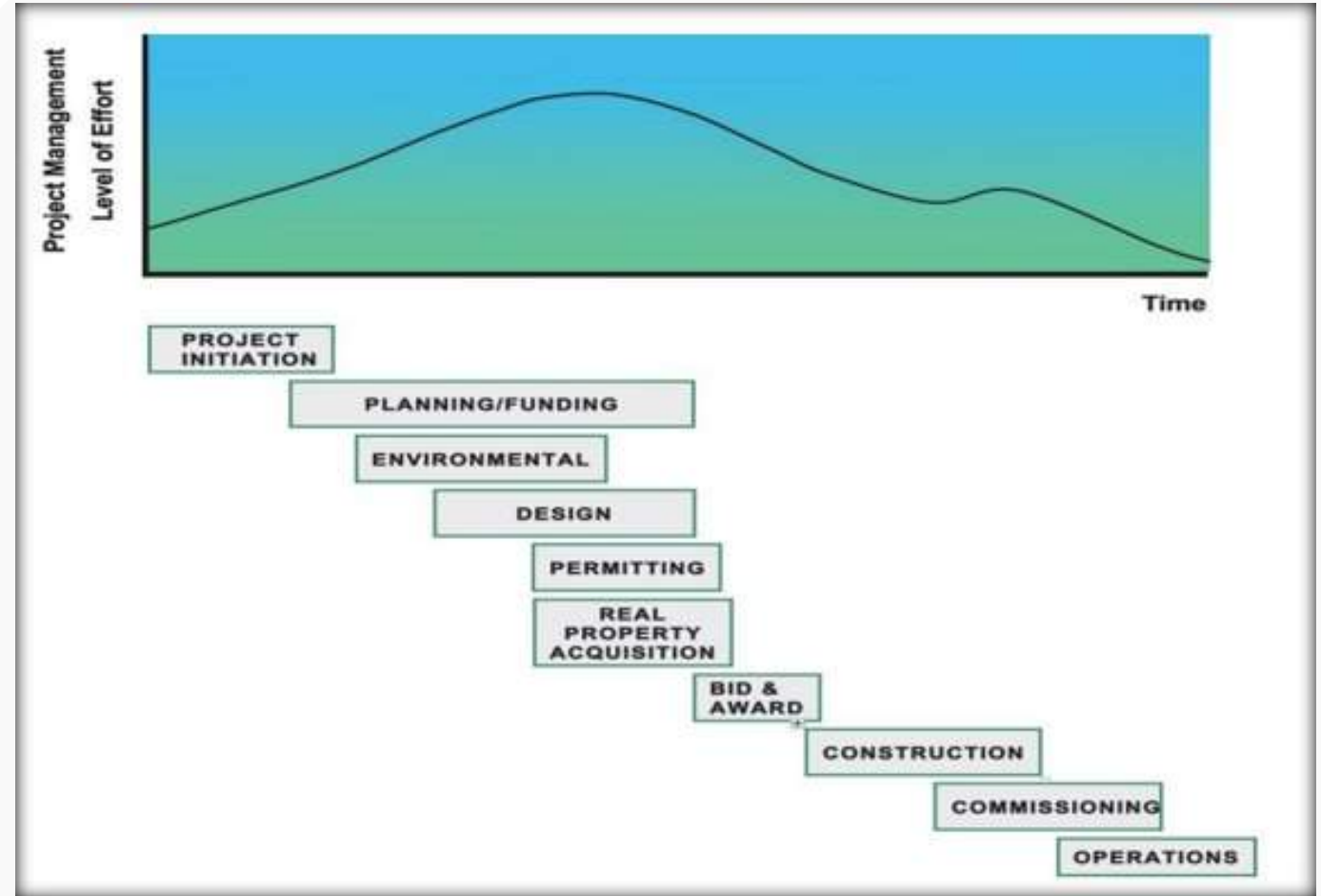


2024 VTA Annual Conference & Bus Expo

# So You Might Need a New Facility...

- ▶ Existing facility at or near useful life
- ▶ Facility not in State of Good Repair
- ▶ Planned service expansion
- ▶ Transitioning to new vehicle fuel type

# Facility Development Process





# Where to Start?

- ▶ **DRPT**
  - Support throughout project lifecycle
  - Potential funding/technical assistance
- ▶ **Executive Leadership**
  - What approvals/decisions will be required when
  - Help identifying and advocating for local match
- ▶ **Procurement**
  - Understand your contracting options for different phases
  - Planning for different project delivery methods
- ▶ **Grants Administration**
  - Identify and apply for grant funding of different phases
  - Project must be included in TIP and STIP to use federal funding

# Planning Phase

# Planning Phase Overview

## Feasibility

- ▶ Needs Assessment
- ▶ Site Identification/  
Evaluation



## Conceptual Design

- ▶ Space Programming
- ▶ Site Layout



## NEPA

- ▶ Social Impacts
- ▶ Economic Impacts
- ▶ Environmental Impacts

# Feasibility Study

## ► Gathering Requirements

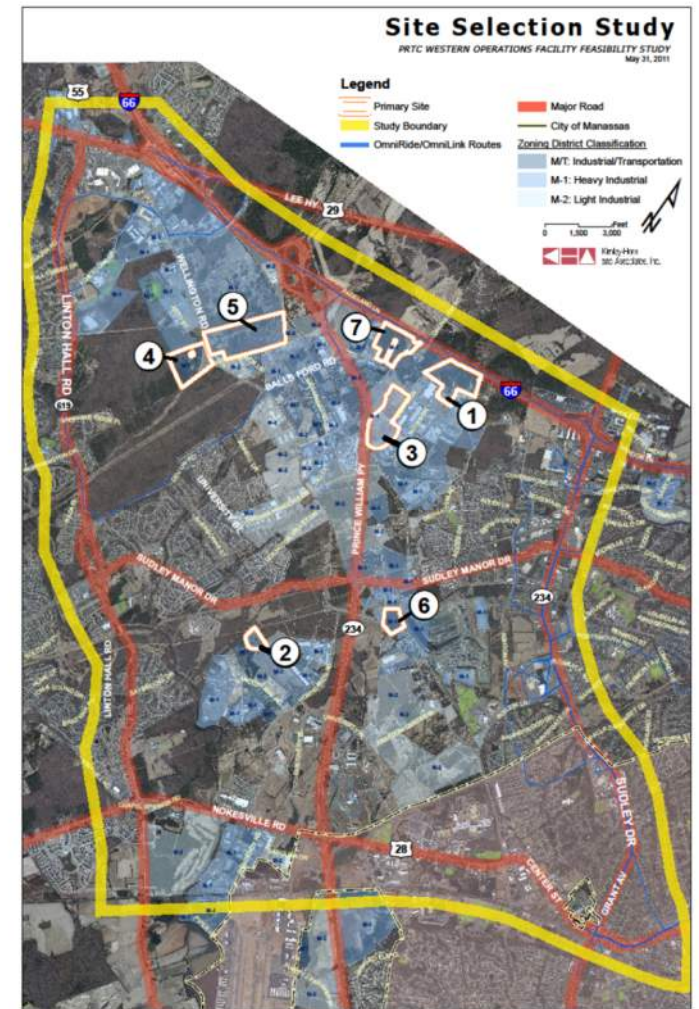
- Review adopted plans for changes that will impact facility needs
- Document requirements not in adopted plans
- Develop criteria for site evaluation

## ► Develop Funding Strategies

- Identify state and federal grant programs
- Understand the local match

## ► Identify and Evaluate Sites

- Analyze using site evaluation criteria
- Phase I Environmental Site Assessment (ESA)
- Title VI



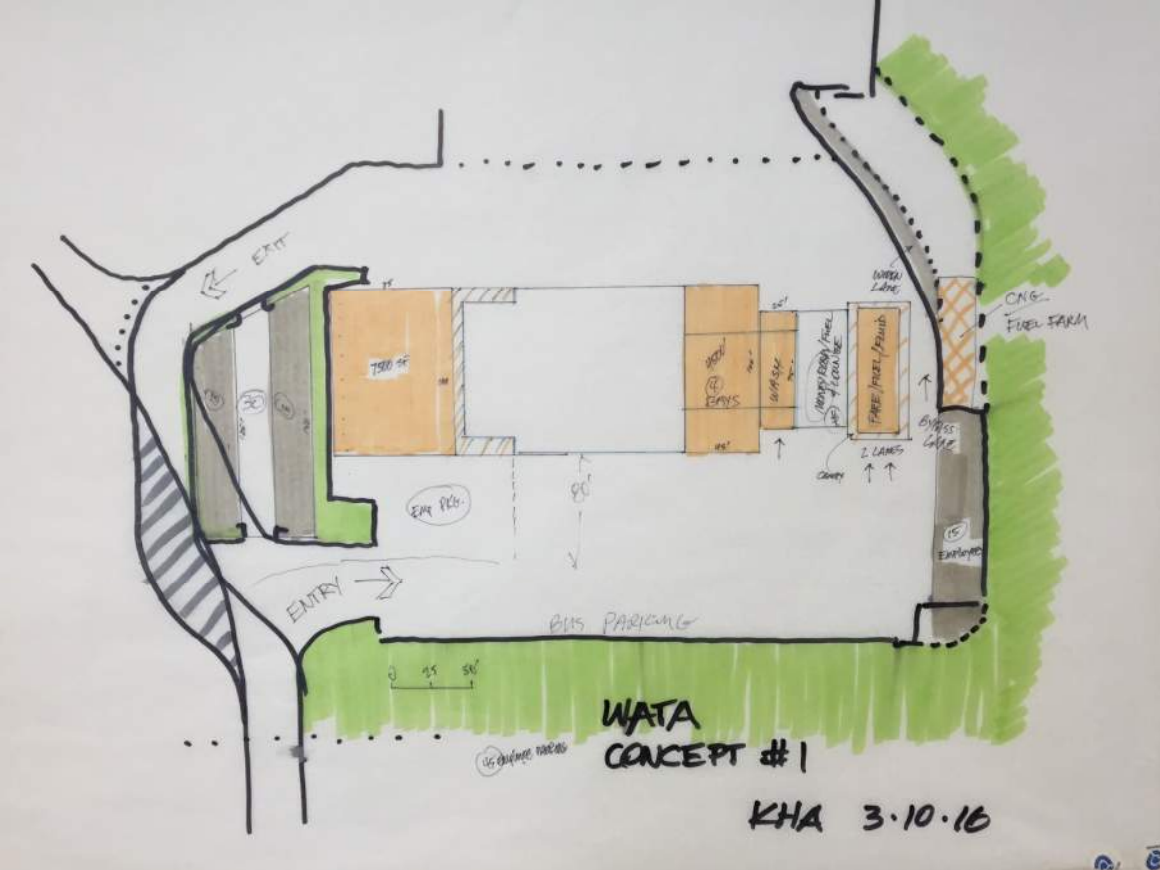
# Conceptual Design

## ► Space Programming

- Usually a workshop
- Relational locations of departments
- Understanding of future needs and level of certainty

## ► Site Layout

- Structure locations
- Access points
- Parking locations
- Vehicle circulation



# NEPA

- ▶ NEPA documentation/actions must be approved by FTA prior to grant award/construction
- ▶ Class of Action
  - Categorical Exclusion (CE)
  - Environmental Assessment (EA)
  - Environmental Impact Statement (EIS)

# Categorical Exclusion (CE)

- ▶ Granted for actions that do not individually or cumulatively involve significant social, economic, or environmental impacts
- ▶ 23 C.F.R. 771.117 provides a list of types of projects which are categorically excluded
  - New bus storage & maintenance facilities,
  - Rehab/reconstruction of bus storage & maintenance facilities,
  - Bus transfer facilities
- ▶ Transit facilities are not automatic CE's

# Environmental Assessment (EA)

- ▶ FTA may require an EA when the significance of the environmental impact is not clearly established
- ▶ Public involvement process must be open & well-documented
- ▶ EA can result in either a:
  - Finding of No Significant Impact (FONSI) requiring no further environmental evaluation, or
  - Identification of potentially significant impacts requiring applicant to conduct Environmental Impact Statement (EIS)

# Environmental Impact Statement (EIS)

- ▶ FTA may require an EIS based on the outcome of an EA, special studies or scoping of the project
  - When adverse impacts are or could be significant
  - Special impacts like endangered species, parkland or historic resources
- ▶ EIS process requires
  - Significant technical analysis
  - Regimented public review
  - Evaluation of project alternatives
  - Identification of the potential social, economic & environmental impacts
  - Identification of mitigation for impacts
- ▶ Successful completion of EIS results in FTA signing a Record of Decision (ROD)
  - Once FTA has signed a ROD, the applicant can proceed with project

# Design Phase



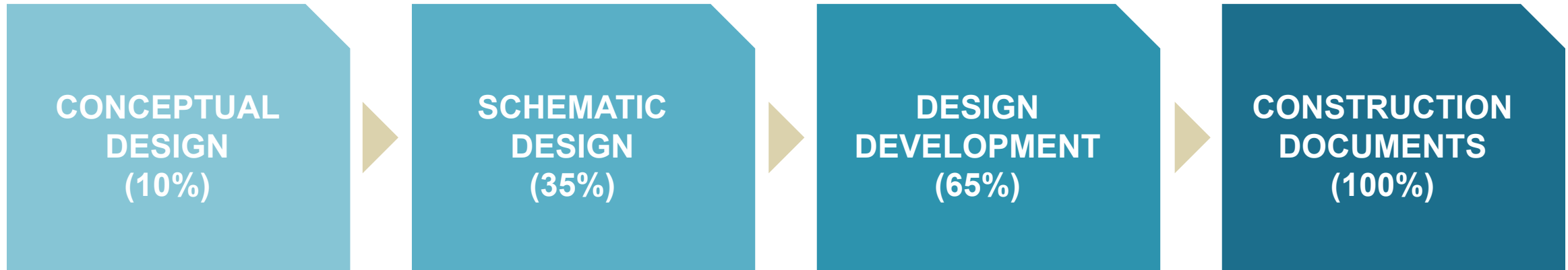
# Transit Facility Design

- ▶ Types of Transit Facilities
  - Bus Operation & Maintenance Facilities
  - Administrative Facilities
  - Bus Transfer Facilities
  - Parking Structures
  - Expansions/Alterations of Existing Facilities
  - Shared-Use Facilities
- ▶ Choosing a Project Delivery Method
  - Design-Bid-Build
  - Design-Build
  - Progressive Design-Build
  - CMAR
- ▶ Procuring the Design Team
- ▶ Develop PMP and Design Schedule

# Design Requirements & Considerations

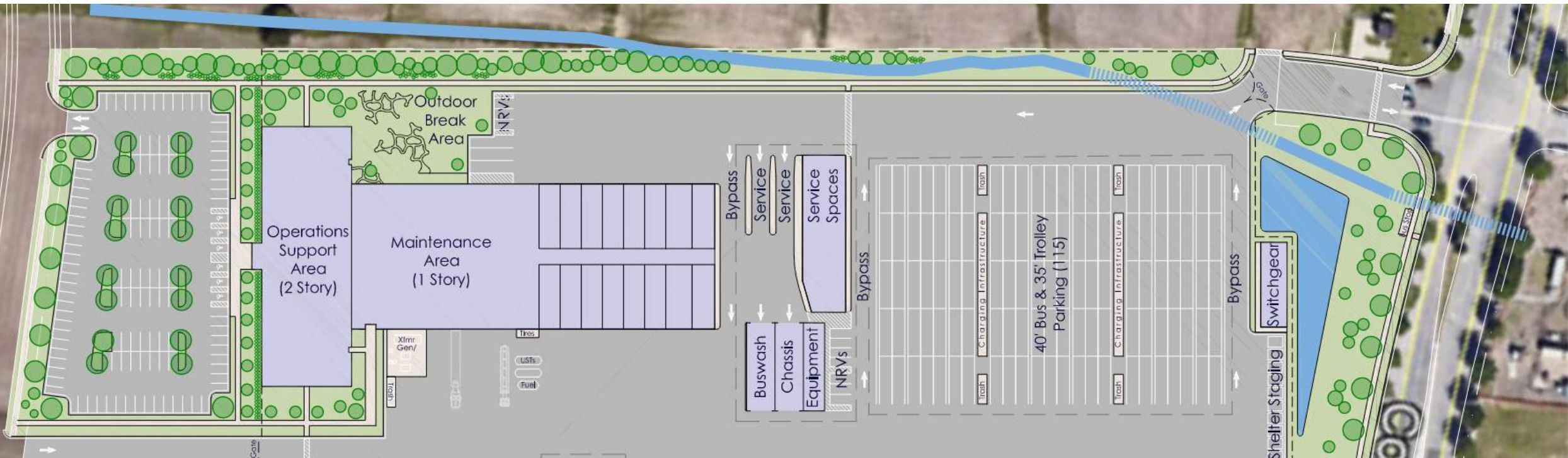
- ▶ **Americans with Disabilities Act (ADA)**
  - New facilities, including new additions and/or alterations to existing facilities, are required to comply with the transportation provisions of ADA (49 CFR parts 27, 37, 38, and 39)
- ▶ **Energy Conservation**
  - Must perform an energy assessment for any building constructed, reconstructed, or modified with FTA assistance (49 CFR Part 622, Subpart C)
- ▶ **Sustainable Design & LEED-Certified Buildings**
- ▶ **Utilities**
  - Buy America applies to utilities (49 CFR Part 661)
  - Generally, FTA will not fund greater capacity or betterments, except for meeting current state and local codes
- ▶ **Crime Prevention & Security Reviews**
- ▶ **State & Local Building Codes**
- ▶ **Industry Design Standards**
- ▶ **Minimum Useful Life of Facility is 40 Years**

# Design Process



# Conceptual Design (10%)

- ▶ Determine Service Requirements
  - Fleet overview / composition
  - Maintenance & Service
- ▶ Determine Programmatic Requirements
- ▶ Conceptual Design
  - Location of buildings & parking areas
  - Site access & circulation
  - General ideas of where departments go in buildings



# Schematic Design (35%)

- ▶ Refine site layout
- ▶ Layout of interior spaces
- ▶ Develop basic exterior designs
- ▶ Value Engineering

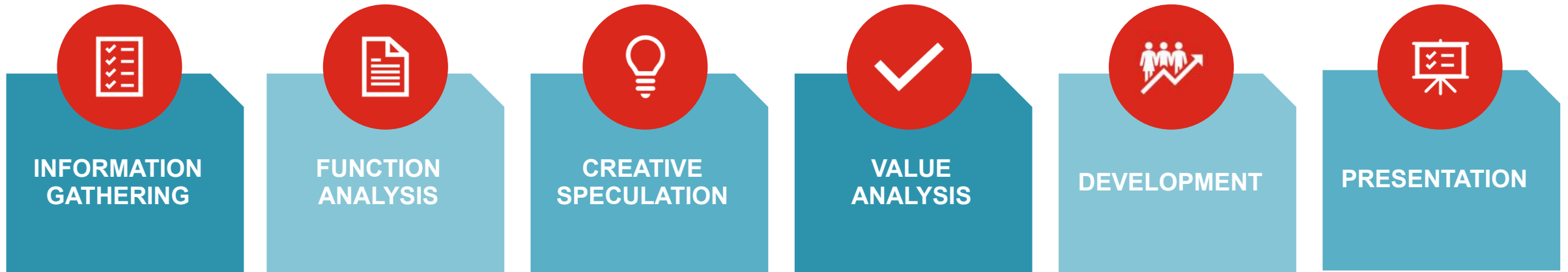


# Schematic Design (35%)

- ▶ Civil begins the site work (grading, drainage, utilities to the building, etc.)
- ▶ Architectural begins interior work (location of all rooms & circulation elements), determine the building volume, create building sections
- ▶ Structural begins design of the building foundations & superstructure
- ▶ MEP begins collaborating with Civil for utility connections, calculating utility room sizes, locating utility rooms & determining locations for large equipment
- ▶ Industrial identifies the types, quantities & location for major equipment
- ▶ Start environmental approvals
- ▶ Update cost estimate based on 35% design documents

# Value Engineering

Value Engineering is a systematic, multi-disciplined approach designed to optimize the value of each dollar spent.



# Design Development (65%)

- ▶ Define & develop important aspects of the project
- ▶ The exterior, interior layouts, room sizes & materials are more fully designed
- ▶ Develop HVAC, plumbing & electrical systems
- ▶ Detailed industrial design



# Design Development (65%)

- ▶ Architectural starts looking at building materials (aesthetics, function, price), furniture layouts & building elevations
- ▶ Structural finishes layout of structural members
- ▶ MEP begins layout of service runs from utility rooms to each room, location of lights, vents, plumbing fixtures, etc.
- ▶ Update cost estimate based on 65% design documents

# Construction Documents (100%)

- ▶ Technical information is finalized
- ▶ Final drawings and specifications
- ▶ Design documents submitted to AHJ for building permit review
- ▶ Prepare IFB package

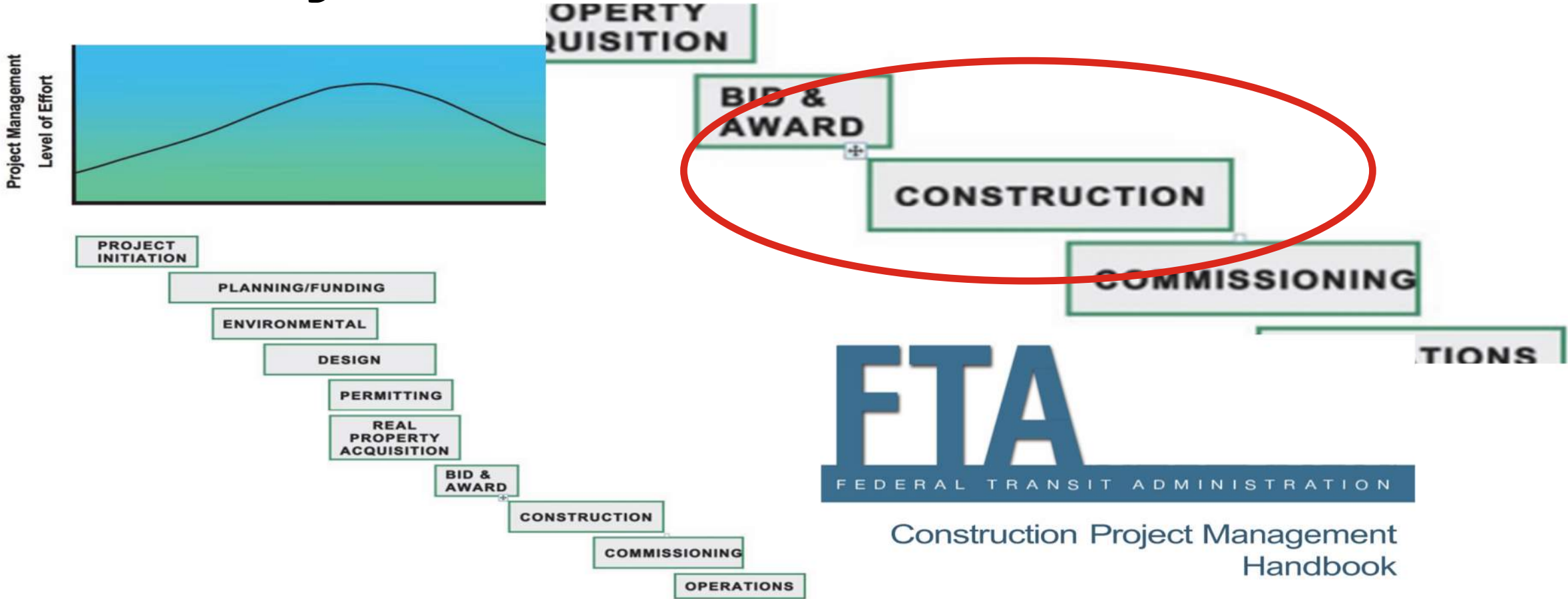


# Construction Document (100%)

- ▶ All disciplines program the design to the detail level (how components come together)
- ▶ Complete technical specifications
- ▶ All approvals complete (including building plan check that starts during this period)
- ▶ Assist client with development of bid documents
- ▶ Update cost estimate based on final construction documents

# Construction Phase

# Construction Project Development & Delivery



Construction Project Management Handbook



# Preparing for Construction

- ▶ Safety & Security
- ▶ You & Your Construction Manager
- ▶ PMP & Procurement Plan
- ▶ Project Controls
- ▶ Quality Management
- ▶ Commissioning
- ▶ Lessons Learned



# Safety Management Plan

- ▶ You are responsible for your safety (not the contractor);
- ▶ OSHA requires that employers provide a safe workplace;
- ▶ Role of the Transit Agency (Project Sponsor)
  - Develop & implement a SMP early
  - Evaluate O&M for risks and hazards
  - Emergency preparedness
  - Monitor construction contractor safety performance
  - Security during CN-Phase



# Safety Management Plan

- ▶ Role of the Construction Contractor
  - Directs & controls safety compliance
  - Prime contractor & all subcontractors, vendors, suppliers
  - Comply with Project Sponsor safety program



# Construction Management & Administration

- ▶ Construction Management
  - Professional service
  - CM represents the owner/project sponsor
  - Total project lifecycle (PE → Commissioning)
- ▶ Construction Administration
  - Typically performed by the designer (A/E)
  - Technical resource during CN-Phase
  - Reviews shop drawings, RFI's, submittals
  - Prepares as-built drawings

# Project Controls

- ▶ Planning & Scheduling
- ▶ Cost & Change Control
- ▶ Document Management/Control
- ▶ Project Management Information System
- ▶ Risk Management
- ▶ Reporting

Function	Document
Management and Control	Project Management Plan Project Budget Project Master Schedule Project Financial Plan (Funding & Cash Flow) Project Policies and Procedures
Quality	Quality Assurance/Quality Control Program Plan
Safety and Security	Management Plan
Design	Functional Analysis Design Standards and Criteria Technical Reports Contract Unit Descriptions
Contracts	Instructions to Bidders and Bid Forms Master Contract General Conditions Contract Drawings Contract Specifications Contract Terms and Conditions
Construction	Resident Engineer's Manual

Phase	Item	Count	Start	End	Notes
Procurement	Phase 1	5	09-23-22	09-30-22	▼ 09-30-22
	Fabrication & Delivery	5	09-23-22	09-30-22	▼ 09-30-22
	P1-FABIDEL-160 Fab/Del Tops for VMB	5	09-23-22	09-30-22	Fab/Del
Construction	PH 1 New Bldgs & South Canopies	183	08-10-22A	04-24-23	
	Valley Metro Building	67	08-10-22A	11-07-22	
	VMB - Interior	67	08-10-22A	11-07-22	
	P1-VB-INT-300 Fire Alarm In-Grid	4	08-10-22A	08-30-22	Fire Alarm In-Gr
	P1-VB-INT-290 Low Voltage	5	08-10-22A	08-31-22	Low Voltage

# Quality Management

- ▶ Quality Control
- ▶ Quality Assurance
- ▶ Construction Testing
- ▶ Special Testing and Inspection
- ▶ Final Inspection/Punchlist
- ▶ Commissioning
- ▶ Post-Construction

# Things to Consider – Lessons Learned!

- ▶ Project sponsor resources (hire your CM early!)
- ▶ Owner-supplied materials & resources (long lead-times)
- ▶ Consider CN-Phase maintenance & operations early in design
- ▶ Project Management Information System
- ▶ Utility improvements/relocations
- ▶ Third party agreements
- ▶ Stakeholder Approvals
- ▶ Weather sensitive activities – reasonable performance period
- ▶ Budget overruns, schedule delays - who has authority to approve?

# Online Resources

- ▶ [Safety Management Plan Template](#)
- ▶ [CN Project Document Checklist](#)
- ▶ [FTA Project & Construction Management Guidelines](#)
- ▶ [APTA BTS-BMF-RP-001-11 Architectural & Engineering Design for a Transit Operating and Maintenance Facility](#)



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**Thank You**  
*Questions & Answers*



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