Master Planning:
Port Planning & Investment Toolkit (PPIT)

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**Future Port Investments**

Non Federal = $154.8 billion – Private Sector Capital (132.2B) and Ports ($22.6B)

Federal = $24.83 billion – FAST ($11B), USACOE Navigation Program and TIGER (625M)

<table>
<thead>
<tr>
<th></th>
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<td>$122,792,800,000*</td>
<td>$127,792,277,595</td>
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<td>North Pacific</td>
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<td><strong>TOTALS:</strong></td>
<td><strong>$22,603,698,905</strong></td>
<td><strong>$132,174,955,000</strong></td>
<td><strong>$154,778,653,905</strong></td>
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Source: American Association of Port Authorities – Capital Investment Projects Survey

During the previous eight rounds, USDOT received more than 7,500 applications requesting more than $152 billion for transportation projects.
Historic Port Infrastructure Funding

FY 2016 FASTLANE

- Requested: $9.80 billion
- Awarded: $0.76 billion
- Awarded to Freight Projects: $0.31 billion
PPIT Working Group

• Initial Pool of Volunteers
  • Led by:
    • Jean Godwin – AAPA
    • Lauren Brand – MARAD
    • Stephen Shafer - MARAD
  • 64 Port Staff & Consultant Volunteers

• Table of Contents Working Group
  • 14 Volunteers
  • Multiple areas of expertise

• Planning & Feasibility Modules Working Group
  • 9 Volunteers
  • Primarily engineering/planning, marketing and economic

• Finance Module Working Group
  • 16 Volunteers
  • Primarily finance, legal and accounting experts

AAPA Professional Port Managers (PPM) Blair Garcia, Elizabeth Ogden, Matt Gresham and Chris Bonura developed the User’s Guide and coordinated the working groups.
The Toolkit can be used to lead a port through a logical and thorough step-by-step process to make sound investment decisions.

The key is that planning, feasibility and finance decisions can be made based on certain thought processes, and adapted to specific and changing circumstances of each port project under consideration.
Planning Module

• Planning Module clearly defines the planning road map required for successful project financing and funding

• Guides users through a common set of planning concepts and methods

• Maintain a highest and best use strategy for port resources with regard to market, community, environment, land-use, economic, and financial considerations

* Consideration of NEPA compliance for projects requiring Federal Action is of particular importance during these efforts.
Initiate: Goals & Objectives

- Every project begins with an initiation effort that involves developing a thorough understanding of the port’s needs that led to the project:
  - Data Collection
  - Stakeholder Engagement
  - Project Goals and Objectives
# Initiate: Data Collection

<table>
<thead>
<tr>
<th>Strategic</th>
<th>Infrastructure</th>
<th>Operational</th>
<th>Market</th>
<th>Financial</th>
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</thead>
<tbody>
<tr>
<td>Port Planning Documents</td>
<td>Site Boundaries and Adjacencies</td>
<td>Vessel Statistics</td>
<td>Historical Port Volumes</td>
<td>Life Cycle Costs</td>
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<tr>
<td>Land Use Studies</td>
<td>Facility Configuration Plans</td>
<td>Berth Operating Statistics</td>
<td>Market Forecasts</td>
<td>Revenue</td>
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<tr>
<td>Waterfront and Near - Waterfront Land Ownership Documents</td>
<td>Maps and Aerials of Existing Sites, Facilities and Infrastructure</td>
<td>Yard Operating Statistics</td>
<td>Freight Origins-Destinations Surveys and Statistics</td>
<td>Cost of Capital/ Evaluation Discount Rate</td>
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<tr>
<td>Port Business and Management Documents</td>
<td>Truck and Rail Access, Inland Rail and Highway Networks</td>
<td>Equipment Inventory</td>
<td>Customer Leases/Contracts</td>
<td>Asset Depreciation</td>
</tr>
<tr>
<td>Regional Economic and Business Data</td>
<td>Inspection/ Condition Assessment Surveys and Reports</td>
<td>Equipment Deployment Patterns and Productivities</td>
<td>Competitor Port Documents</td>
<td>Tariffs</td>
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<tr>
<td>Transportation Plans and Improvement Program Documents</td>
<td>Waterside Access</td>
<td>Labor Deployment Patterns</td>
<td>Carrier Schedules, Capacity and Fleet Sizes</td>
<td>Macroeconomic Forecasts (Consumer Price Index &amp; Interest Rates)</td>
</tr>
<tr>
<td>State/Local Freight Plans</td>
<td>Environmental Site Assessment Reports</td>
<td>Labor agreements</td>
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<td>Contracting Requirements</td>
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</tbody>
</table>

**Port Planning Module**
Initiate: Stakeholder Engagement

Potential Port Project Stakeholders
- Terminal operators and tenants
- Ocean carriers
- Cargo owners
- Stevedore/terminal labor
- Community and neighbors
- Inland transportation providers: truckers and rail lines
- Logistics providers: warehousing suppliers, shippers
- Financial/infrastructure investors
- Local/tribal governments
- Environmental agencies
- Regulators
- Metropolitan planning organizations (MPO)
- Regional planning boards
- State transportation authorities/departments
- Non-governmental organizations
Quantify: Drivers

- Regulatory Environment
- Market Dynamics
- Competitive Position
- Market Forecast
Quantify: Existing Conditions

• Identify and quantify the Port’s needs by comparing its current capabilities to its potential opportunities and requirements of stakeholders and the community
  • Assets
  • Operations
  • External Influences
  • Volumes & Trade Flows
  • Capacity:

Inputs:
- Demand Forecast
- Cargo Characteristics
- Dwell / Velocity
- Productivity
- Vessels
- Peaking Patterns
- Site Layout

Constraints:
- Berth/Wharf
- Storage Area
- On-Dock Rail
- Gate
- Major Equipment
- Waterside Access
- Landside Access

Outputs:
- Cargo units per year
- Passengers per year
- Ship calls per year
- Barge moves per year
- Rail cars per year
- Truck trips per year
- Trucks per peak hour
Quantify: Project Needs and Context

Project Needs - Demand and Phase Capacities

GAP ANALYSIS

Low Case
Base Case
High Case
Capacity

Project Needs
Project Needs
Loss of Revenue
Lower Return on Investment

Multiple Project Alternatives
Alternatives Assessment and Review
1. Examination
2. Winnowing
3. Extending
Reasonable Project Alternatives
Alternatives Refinement
Phasing
Timing
Details & Costs

Feasibility: Measure Performance
Impacts
Risk

Proposed Project Alternatives for Evaluation
Form: Refine Reasonable Alternatives

- Phasing
- Timing
- Details
- Cost
Capacity, Development & Cost Phasing
Feasibility Module

- Feasibility Module describes how ports create financially feasible project plans that take into account all aspects of cost, risk, and reward.

- Identifies the metrics for the physical, commercial and financial components of project success and how the metrics can be measured and evaluated.

- Focuses on performing feasibility analyses specific to a port’s individual capabilities, markets, and competitive relationships.

*Consideration of NEPA compliance for projects requiring Federal Action is of particular importance during these efforts.*
Measure Performance

Physical & Operational
• Capital Resources
• Operating Resources
• Capacity and Productivity

Market & Financial
• Revenue Forecast
• Cash Flow Modeling
• Capital Expenditure
• Operating Expenditure

Comparative Costs

<table>
<thead>
<tr>
<th></th>
<th>Manual</th>
<th>Auto + MST</th>
<th>Auto + AST</th>
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</thead>
<tbody>
<tr>
<td>NPV in $M</td>
<td>-1,826</td>
<td>-1,618</td>
<td>-1,510</td>
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</table>

Legend:
- Residual Value
- Initial CapEx
- Maintenance & Repair
- Operating Labor
- Rehab & Replacement
- Insurance
- Administration
## Measure: Impacts

<table>
<thead>
<tr>
<th>Impact Type</th>
<th>Direct</th>
<th>Indirect</th>
<th>Induced</th>
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</thead>
<tbody>
<tr>
<td><strong>Institutional Port User</strong></td>
<td>Vessel turnaround time</td>
<td>Vessel traffic</td>
<td>Regional waterfront access</td>
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<tr>
<td></td>
<td>Truck / train service time</td>
<td>Adjacent road/rail use</td>
<td>Regional road/rail use</td>
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<tr>
<td><strong>Social</strong></td>
<td>Port safety</td>
<td>Protection of nearby community</td>
<td>Regional security</td>
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<tr>
<td><strong>Economic</strong></td>
<td>Operating noise</td>
<td>Noise pollution</td>
<td>Regional noise health effects</td>
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<tr>
<td></td>
<td>Port labor employment</td>
<td>Local logistics employment</td>
<td>Regional employment</td>
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<td></td>
<td>Operating expense</td>
<td>Customer costs</td>
<td>Regional economy</td>
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<tr>
<td><strong>Environmental</strong></td>
<td># of machines and operating hours</td>
<td>Air emissions</td>
<td>Air quality</td>
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<tr>
<td></td>
<td>Fuel / power consumption</td>
<td>Power grid capacity</td>
<td>Climate change</td>
</tr>
<tr>
<td></td>
<td>Facility runoff</td>
<td>Water quality</td>
<td>Coastal environment</td>
</tr>
</tbody>
</table>
Measure: Risk

Examples:
- Cost of materials
- Revenue capture
- Construction delays
- Construction cost overruns
- Equipment acquisition delays
- Inflation
- Cost of raising finance
- Maintenance cost overruns
- Life cycle cost acceleration
- Force majeure
Evaluate: Delivery Approach

Common techniques:
• Cash flow evaluation
• Benefit-cost analysis
• Multi-criteria evaluation
Evaluate: Cash Flow Evaluation

Common techniques:

- Net Present Value (NPV)
- Internal Rate of Return (IRR)
Evaluate: Benefit Cost Analysis

- Measure the net welfare change over the life of a project
- BCA is a comparison of:
  - Economic Advantages – Benefits
  - Disadvantages – Costs

Resources:
- BCA Resource Guide
- OMB Circulars A-4 and A-94
- NCFRP Report 38
## Multi Criteria Evaluation

Evaluation of Alternatives' Performance. Criteria categories may include:

- **Financial**
- **Economic Impact**
- **BCR**
- **Operational**
- **Environmental**
- **Risk**

### Criteria Categories

- **Financial**
  - Net Present Value of Costs ($M)
  - Initial (Year) Capital Outlay ($M)
  - Unit Operating Cost
- **Economic Impact**
  - Operational Performance
  - Capacity at Site Buildout
  - Berth Productivity at Buildout
  - Gate Truck Cycle Time
- **Operational**
  - Intermodal Service
  - Development
  - Suitability for Phased Implementation
  - Development Complexity
  - Risk of Delay
- **Environmental**
  - Carbon Fuel Consumption
  - Noise Pollution
  - Light Pollution
  - Total Energy Consumption
  - Land Utilization
- **Risk**
  - Total Energy Consumption

### Table: Multi Criteria Evaluation

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<th>Account Element</th>
<th>Weight (1-10)</th>
<th>Normalized/Assigned Scores</th>
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<th>Alt. 2</th>
<th>Alt. 3</th>
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<td>Light Pollution</td>
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<td>Total Energy Consumption</td>
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<td>10.00</td>
<td>8.00</td>
<td>8.67</td>
<td>80</td>
<td>64</td>
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Financing Module

- **Finance Module** helps project leads navigate a wide range of capital investment decisions, from simple to complex.

- Used for any number of capital investment activities including, but not limited to:
  - Asset-Backed and Lease Financing
  - Weighing Traditional vs. Alternative Financing
  - Project Finance Structuring
  - Evaluation and Implementation of Public-Private Partnerships
  - Procuring Government Loans and Grants
# Glossary of Terms

- **Project Type**
  - Port-wide
  - Inland Port
- **Sponsor**
  - Lake Sakakawea (Public, North Dakota)
  - Port of Longview (Public, Washington)
  - Coos Bay, Oregon (Public, Oregon)
- **Study to Determine the Feasibility**
- **EIS/EIR Documents**
- **Project Profiles/Case Studies**
  - **Port-wide**
    - Long Beach, California
    - Jacksonville, Florida
    - St. Lucie County, Florida
    - Pierce Master Plan, Washington
  - **Port of Long Beach**
    - Avalon, California
  - **Inland Port**
    - Port of Longview, Washington
    - Coos Bay, Oregon
  - **Cruise**
    - Southwest Tsing Yi
  - **Container**
    - Terminal 10 at Port of Long Beach
  - **Year**
    - 2013
  - **REAP Investment**
    - Jordan Cove
  - **Joint Center**
    - AECM Asia Co. Ltd.
  - **Plc**
    - Liquid Bulk Terminal
  - **Plan Development**
    - Pierce Master Plan Update

# Port Planning & Investment Toolkit

## PPIT Resources

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Title</th>
<th>Author</th>
<th>Sponsor</th>
<th>Type</th>
<th>Year</th>
<th>Project Location</th>
<th>Project Type</th>
<th>Link</th>
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<tbody>
<tr>
<td>Strategic/Master Plans</td>
<td>Draft EIS for a Cruise Ship Berthing Facility</td>
<td>AECM</td>
<td>Department of Transportation</td>
<td>Public</td>
<td>2014</td>
<td>Coos Bay, Oregon</td>
<td>Port-wide</td>
<td><a href="http://www.polb.com/environment/docs">http://www.polb.com/environment/docs</a> getCruisefacility1.5B%20EN%20(Final)%20Jan%202013_FINAL%20ADOPTED%207-13-12.pdf</td>
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Want to Know More?.....

www.aapa-ports.org/toolkit
Master Planning:
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Thank You

October 24, 2017

Blair Garcia
US Director – Maritime Division