Road to Sustainable Construction

- **1970 NEPA**
  - Short term Impacts
  - Mitigation Measures
- **1990 Environmental Management Systems**
  - SE & SC
  - HTRW Demolition Wastes
  - In-water construction
- **Culture of Sustainability**
  - 20 of 69 LEED Rating Points from construction
  - Role in additional 21 points
Role of Construction Practices in Project Sustainability

- Management Systems
- Schedule Efficiency
- Waste Reduction

Economy

- Material Conservation
- Natural Resource Enhancement
- Environmental Permit Conditions

Environment

Society

- Job Opportunity
- Good Neighbor/First Impression
- Security
A Contractor’s View---

• Unknown + Fear = $

• Understanding + Culture of Sustainability

= Profits
Management Systems

- Contracting Mechanisms
  - Design-Bid-Build
  - IDIQ
  - Design Build
  - Public Bidding Rules
  - Construction Manager

- Bring Contractor into Project Team Early

- Integrated Design/Construction Action Plan

- Worker/Subcontractor Training

- Continuous Monitoring and Reporting

- Documentation

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Schedule Efficiency

- Coordinate multiple projects/contracts
- Reduce time of open surface
- Reduce active equipment time
- Better for the environment
- Better for the bank book
Schedule -

Use technology to expedite –

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Waste Reduction

- 75% of building construction raw materials end up as waste
- Waste management as part of the integrative design process
  - Direct reuse and recycling
  - Source separated materials
  - Goal of 75% Reuse/Recycle
- Clear direction in specifications
- Jobsite orientation and monitoring
Materials Management

- Contaminated soils/groundwater
  - Treatment
  - Transport/dispose
  - Cap onsite
- Soils
  - Onsite reuse of borrow
  - Regional plan for reuse

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Paving – Environmental Considerations

• Water based asphalt
• Oil based asphalt
• Partial paving; unpaved
• Air Quality Issues
• Water Quality Issues

• Structural and Maintenance Requirements
• Make a proactive choice with involvement of designer, contractor, and O&M personnel

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Construction Impacts

• Reduce Air Emissions
  - Technology
  - Scheduling
  - Credits

• Early Implementation of Storm Water BMPs
  - Reinforced grass surface instead of impervious areas
  - Green roofs for warehouse structures
  - Reduce curb and gutter construction by using sheet flow
  - End of pipe treatment using hydrodynamics separators to control trash, oil, grease, sand, and metals
  - Underground sand filter or water quality treatment system
  - Roof disconnection by conveyance to grass areas
Natural Resource Enhancement
Storm Water Management
Permit Compliance

- Multi-agency permit conditions
- Multiple contractors responsible for compliance
- Create a compliance program that simplifies steps for reporting
- Unify system for multiple contractors
First Impressions are lasting

Actively plan construction infrastructure

For example: Dulles Airport Capital Development Program includes formal infrastructure development process
Construction Infrastructure

- Contractor Staging areas
- Batch plants
- Access and traffic routing
- Increased gate capacity
- Material Storage
Construction Infrastructure

- Consciously site these facilities to contribute to finished project/not conflict
- Avoid incidental infractions of environmental regulations
- Avoid offsite traffic issues
- Avoid interference with ongoing operations
Security

- DoD Antiterrorism Standards and Whole Building Design Guide Conflicts
  - Standoff Distance
  - Unobstructed Space
  - Structured Parking
  - Materials Reuse/Recycled

- Busy Port Specific Standards More Appropriate
Understanding + Culture of Sustainability = Productivity and Security
Water Quality: Sustainable Maintenance of Navigable Waterways are achieved through:
a. Holistic and Life Cycle Understanding of the Watershed/Ecosystem that has created the sediments and is now going to be Impacted by Removing the Sediments
Sustainable Dredging Strategies: Green Dredging Equipment

- High efficiency dredge or slurry pumps
- High accuracy (metered) winch systems with high holding power and anchor systems
- De-gassing equipment
- Hopper overflow controls
- Special dragheads with cutters, visors and turbidity control
- Swell compensators
- Dredging & production computers with nuclear density and flow measurement gauges for concentration monitoring
Environmental Dredging Equipment:

- Is highly efficient in terms of dredging, containment & transport (e.g. cutting & pumping or excavating, containing & disposal)
- Has the ability to reduce the amount of dilution by maintaining dredged density and limiting water content
- Has the means to position itself very accurately and remove material in a controlled & precise manner
- Is fitted with sophisticated Kinematic DGPS positioning, dredging computers, production & other data logging equipment often radio linked to a shore station.
- Limits or reduces turbidity significantly
Sustainable Dredge Materials Management Strategies

- Consider Developing Holistic Dredge Materials Management Plans
- Look beyond the Project Scope and Needs
- Consider beneficial Upland use of Suitable Sediments
- Consider Developing RSM partnerships & arrangements with Corp, etc
Finding Sustainability in Dredging

- Beneficial Use of Dredge Materials
- Holistic Watershed Based Approach
- Green Port Opportunities
- Comprehensive Ecosystem Restoration program
- Regional Sediment Management

O&M Projects

Sustainable Dredging

Navigation

Environment
Sustainable Dredge Materials Management Strategies

• **Sustainable Use of Different Sediments:**

• **Rock Materials:** Create Fishing Reefs

• **Suitable Materials:** Beach Nourishment (Sand Only)

• **Wetlands and Sub aquatic habitat creation** (restricted to certain types of materials)

• **Unsuitable Materials:** Processed to Cap Brownfields/Portfields as well as Regional landfills.
Processing Dredge Materials: Stabilization/Solidification, ETC

Processed Dredged Material
Sustainable Regional Sediment Management: RSM

- Partner with the USACE in pursuing RSM by collaborating with local and state governments to manage sediments over regions encompassing multiple projects.
Sustainable Dredging

- Air Quality:
- In order to reduce emissions of NOx and PM from Dredging Operations/Equipment:
  - Consider clean diesel fuel dredges in the contract; or
  - Consider electric dredges in contract
  - In Non-Attainment areas, it may be required as a mitigation measure regardless
Sustainable Water Side Construction

• Social Equity:

• Consider wetlands creation, and wildlife habitats via beneficial Use of suitable sediments in areas of the port neighboring socio-economically challenged areas of the community.

• Require minority contract participation in dredging contracts.