Great Lakes Commission

Transportation of Dredged Material

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Dredged Materials: Transportation Challenges & Cost Considerations

presented by

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Objective

―Plan recognizes that CDFs are a necessary part of the solution, but additional approaches are needed. …
- Emphasizing beneficial uses of dredged material (including reclaiming material already deposited in CDFs for beneficial reuse) "

- Disposition strategies discussed
- Transportation of dredged material for beneficial use not evaluated
- Transportation costs can be limiting but there are funding opportunities
Agenda

- Transportation Options
- Cost Integration into a Management Plan
Transportation Options

- Bed Load Interceptor
- Barge
- Self-unloading Freighter
- Hydraulic Dredging & Pipeline Discharge
- Truck
- Rail
Bed Load Interceptor

**Benefits**
- handled only once
- little/no noise
- low carbon footprint
- multiple locations
- safe
- dewater within yards of extraction site
- all granular material

**Challenges**
- upfront costs
Hydraulic Dredging & Pipeline Discharge

- Benefits
  - allows movement of large quantities of material for relatively short distances and fairly flat land
    - up to 4 miles
Hydraulic

- Challenges
  - best suited for MMS / End Use that can handle large volumes of water, at or adjacent to a water resource (beach nourishment or habitat restoration)
    - for every yard of sediment moved, 10 yards of water is moved typically more costly per cubic yard
  - can only be used on certain types of material
    - cannot be used on hard / rock material
Fox River Sediment Dredging
Hydraulic – Geotube®

- Typically used for high organic matter material to be used for
  - top soil
  - top soil blending
- Typically staged at, or near, dredging site
- Widely acceptable by regulatory agencies
  - mitigates water quality issues
Barging

Benefits:

- more efficient when material management site (MMS) / end use is further away
- greater capacity - typical barge can carry 33 – 60 truckloads
- low carbon footprint
- no spill cleanup
- no traffic / pedestrian safety concerns
- reduces total project time – normally allows 24-hr dredging
Barging

- Challenges
  - requires additional handling
  - MMS / End Use needs to be accessible to water
  - may require infrastructure - unloading site dock
Self-unloading Freighter

- **Benefits**
  - capacity

- **Challenges**
  - limited practicality
Trucking

- **Benefits**
  - usually does not require additional infrastructure
  - unlimited distance between dredge and disposal sites
Challenges

- cost
- road wear
- traffic & pedestrian safety
- material must be dewatered prior to beneficial use
- fuel consumption
- carbon footprint
- spill potential
Rail

- **Benefits**
  - High capacity rail cars
    - >100 tons = 4 truckloads
  - Limited traffic congestion
  - No damage to highway infrastructure
  - 2-4 times more fuel efficient and 3 times cleaner than trucks
  - Material can be moved long distances

- **Challenges**
  - MMS / End Use site needs to be near rail line
    - may add rail spur (ex frac sand) - known costs
    - mine reclamation
  - Acquisition of rail cars
  - Coordination with other rail companies
  - Use of bi-modal transportation can reduce costs
Cost Integration Into A Management Plan

Bed Load Interceptor $3 to 5 / cy
Barge $5 to 10 / cy
Self-unloading Freighter $5 to 10 / cy
Hydraulic Dredging & Pipeline Discharge $12 to 17/cy

(estimate - 2 miles)

Truck $13 to 20 / cy
Rail $.05 / cy / mile, $45/cy, $15 - $19/cy
Cost Integration Into A Management Plan

- End use market value of the material
  - identify a market value for the beneficial use of the material
  - value offsets the transportation cost

- Examples
  - private beach nourishment
  - DOT & private infrastructure uses
  - soil blending
  - brownfield & landfill capping
  - wetland bank creation (for profit)
  - fill for building foundations
Cost Integration Into A Management Plan

- Social / environmental value of the material
  - the action is a public good
    - produces good will
    - willingness to pay additional cost
    - environmental benefits
    - public health benefits

- Outcomes
  - habitat creation
  - beach nourishment
  - shoreline stabilization
  - improved water quality
  - job creation
Cost Integration Into A Management Plan

- Need funding sources sanction of higher transportation costs
  - social benefits
    - lower carbon footprint
    - pedestrian / vehicle safety
    - environmental benefit & value of end use
  - economic benefit
    - new market creation

- Examples
  - wetland development
  - beach nourishment
  - wetland mitigation
  - job creation in beneficial use industries
Cost Integration Into A Management Plan

- Funding Scenarios
Cost Integration Into A Management Plan

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Cost Integration Into A Management Plan

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(Port of Green Bay, WI)
Cost Integration Into A Management Plan

CDF Airspace *(CDF 12, Cleveland OH)*