Economic Issues and Approaches for Safe Passage MSWG

Summary of NOAA Economic Team Project, Goals and Role

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NOAA Analytical Support in Economics: Project Goals

- Provide information, consultation, and analytical support to the MSWG during the optioning process
- Build economic models and estimate the impact of alternative shipping management options advanced by the MSWG
- Estimate the value of whales to the regional economy as well as the non-market value of whales to whale watching customers

Project Team Members

NOAA Project Analytical Team

- Theresa Goedeke, Sociologist, NCCOS
- Dan Dorfman, Marine Conservation Planner , NCCOS
- Sarah Gonyo, Natural Resource Economist , NCCOS
- Matt Gorstein, Social Science Analyst , NCCOS
- Bob Leeworthy, Chief Economist, ONMS
- Greg Silber, NMFS Office of Protected Resources
- K. Eric Wolfe, NOS Chief Economist, Office of the NOS AA

NOAA Project Team Member-Partners

- Chris Caldow, CINMS
- Ryan Freedman, CINMS
- Steve Gittings, ONMS
- Sean Hastings, CINMS
- Morgan Visalli, CINMS

Bren Student Project Team

- Doris Bleecher
- Jennifer Bone
- Elena Meza
- Kendall Mills
- Laura Lea Rubino
- Lily Tsukayama
- Steve Gaines, Bren Project Advisor
- Rebecca Gentry, Bren Project Mentor

Project Goal 1

PROVIDE INFORMATION, CONSULTATION AND ANALYTICAL SUPPORT

What are we doing?

- Conducting reviews of relevant economic literature
- Compiling information on known datasets of potential value to working group deliberations or economic modeling
- Exploring ideas to incorporate basic economic report features into the MSWG Sea Sketch tool

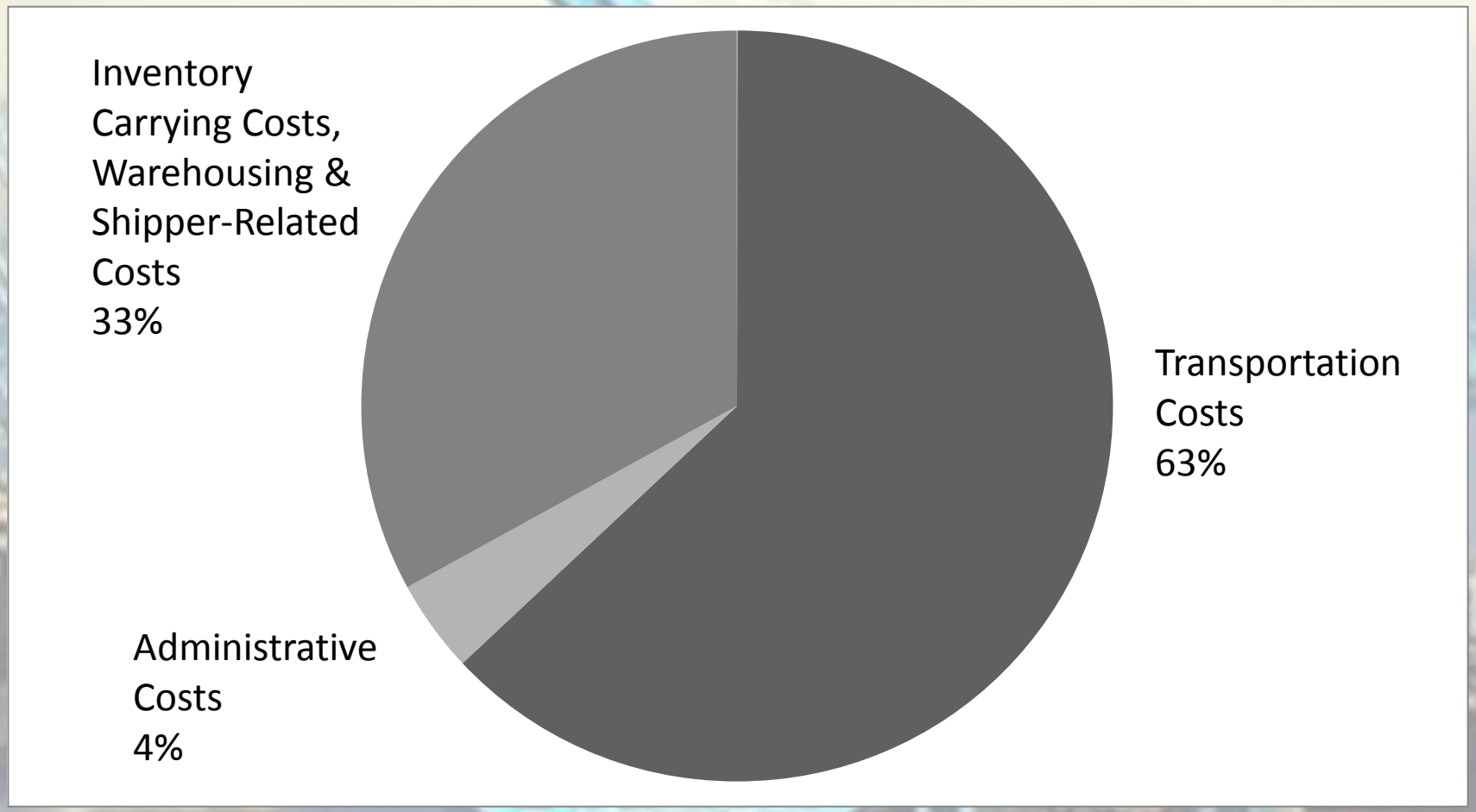
Project Goal 2

BUILD ECONOMIC MODELS TO ESTIMATE COSTS TO SHIPPERS

What are we doing?

- Considering possible approaches to development of economic models
- Identifying economic datasets that can be used in economic models
- Pulling and preparing required data
- Building, testing, and refining economic models
- Running economic models using options advanced by the working group

COMPONENTS OF TOTAL LOGISTICS COST



Sources: Department of Transportation, Federal Highway Administration, *Logistics Costs and U.S. Gross Domestic Product*, August 25, 2005 and affirmed by the Council of Supply Chain and Management Professionals, *The Critical Role of Transportation in Business and the Economy*, February 7, 2014.

Valuation Systems: Inventory Carrying and Transportation Costs

- Inventory Carrying Costs
  - Capital cost for inventory investment
  - Inventory service costs
  - Storage costs
  - Inventory risk costs
- Transportation Costs
  - Deepwater water carrier
  - Motor carrier
  - Mixed carriers
  - Inland water carrier
  - Rail
  - Pipeline

Costs: Fuel, crew, capital, overhead, etc.

Mitigation Measures Used to Reduce Encounters between Vessels and Whales

- Creation of *Traffic Separation Schemes*
- Realignment of *Traffic Separation Schemes*
- Designation of *Areas to be Avoided*
- Designation of vessel speed restriction areas
- Detection of whales and issuance of advisories to mariners
- Seasonal vs permanent mitigation measures
- Voluntary vs mandatory mitigation measures

Potential Cost Affects of Re-routing and/or Speed Reduction Measures on Shipping

- Increased inventory carrying costs
- Increased transportation costs
- Additional charges for local land-based support transportation and infrastructure
- Loss of revenue over the life of the ship due to reduced number of trips because of longer voyages
- Disruption in the flow of product or available infrastructure to other areas
- Diversion of shipping traffic to other U.S. ports
- Diversion of shipping traffic to foreign ports

Needed to Estimate Inventory Carrying & Transportation Costs

- Variables
  - Type of ship
  - Transit speed(s)
  - Weight of cargo
  - Type of cargo
  - Vessel travel segment length / associated speed
  - Other engineering demographics of vessel (e.g., hull dimensions, propeller size, fuel type(s), etc.)
- Identification of time frame for analysis of projected costs / benefits
- Understanding of context and contributing variables

Limitations to Data Availability

Challenge

- Cost of data collection
- Confidentiality
- National Security
- Differential data collection standards, parameters, and requirements
- Differential Federal regulations governing collection, distribution, and access to data

Consequence

- Limits on types and periodicity of data collected
- Granularity or resolution of data available
- Different parameters or standards used, so similar variables not comparable across datasets
- Restrictions on the access, use or release of data

Primary Economic Datasets Identified: Inventory Carrying Costs

- United States Department of Commerce, Census Bureau's *USA Trade® Online*
- United States Department of Transportation's Maritime Administration (MARAD)
- USACE's Channel Portfolio Tool (CPT)

Primary Economic Datasets Identified: Transportation/Operational Costs

- USACE's National Navigation Operation and Maintenance Performance Evaluation and Assessment System (NNOMPEAS)

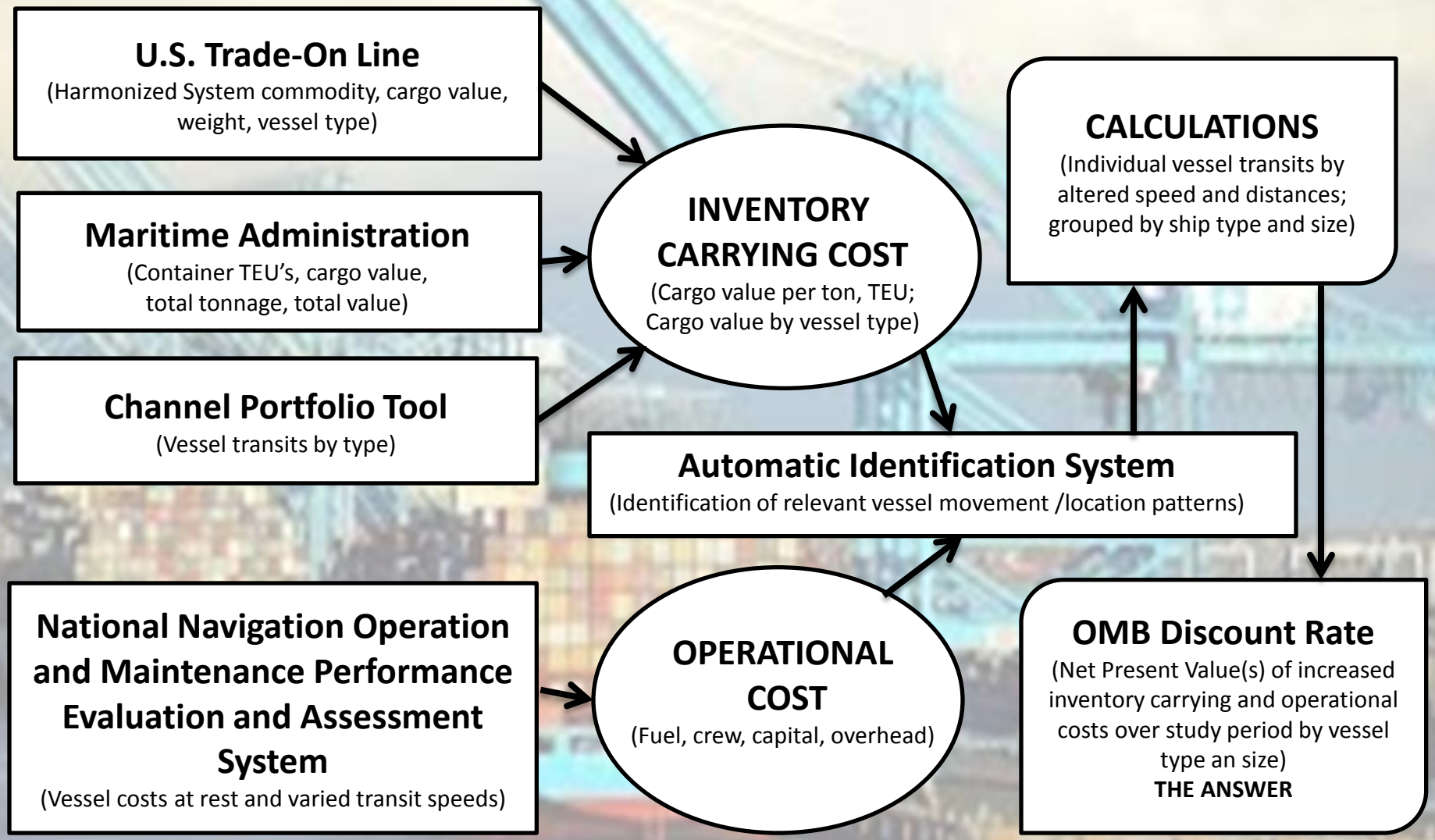
Primary Economic Datasets Identified: Discount Rate & Adjustments for Inflation

- The Congressional Budget Office's Discount Rate (CBO's Circular No. A-94)
- Use of Gross Domestic Product as Deflator
- Placement of Costs in 2014 US Dollars

Automatic Identification System (AIS) Data

- Operationalization of economic models to calculate the impact of scenarios to shipping cost requires linking economic data to AIS data
- AIS data are used to determine route and speed patterns for vessels or vessel classes
- Route and speed data can be linked to economic data using key or common variables, such as vessel type or type of cargo
- Depending on the granularity or resolution of data available from both datasets, the “fit” between them may be more or less robust

LOGIC MODEL – ADDED VESSEL COSTS WITHIN LOS ANGELES PORT DISTRICT



Project Goal 3

ESTIMATING THE ECONOMIC VALUE OF WHALES, WHALE WATCHING & OTHER ECOSYSTEM SERVICES

Survey of Whale Watching Tour Operators

- Cost and earnings data to estimate value of businesses on local economy
- Spatial data on where whale watching activities occur to assess the likely costs and benefits of options on the whale watching industry

Survey of Whale Watching Customers

- Expenditure data to estimate effect of participant spending on local economy
- Non-market valuation of whales and possibly other relevant ecosystem services to estimate participants' willingness to pay for particular goods or services resulting from policy options

Comments & Questions