

New Jersey Department of Transportation
Bureau of Research

Technical Brief



Channel Usage Research and Analysis

This study developed recommendations for how NJDOT can establish one or more methodologies for collecting vessel counts and classification data. By reviewing current methodologies used worldwide, and conducting their own pilot, the research team developed recommendations for how NJDOT can establish their own data-gathering system.

Background

The NJDOT Office of Maritime Resources (OMR) sought to develop an asset management system to more efficiently manage New Jersey's Marine Transportation System. The first step was to assess the economic value of New Jersey's channels and establish a count of vessels utilizing these channels. Vessel usage was determined by compiling available data on waterway services like slips per marina per channel, residential docks per channel, and boat ramps per channel. However, channel usage varies depending on factors such as weather, time of year, origin/destination, size, tides, type of vessel, and the availability of alternative routes. To satisfactorily assess channel usage, actual vessel count data needed to be checked against previously collected data, and a viable method of gathering vessel counts and classification data needed to be established.

Research Objectives and Approach

The objective of this research was to ensure that NJDOT established a reliable, repeatable and verifiable methodology for collecting vessel counts and classification data by time of day. Once established, NJDOT could then apply this methodology to gather data on its own Marine Transportation System of approximately 214 channels. Cambridge Systematics, Inc (CS) and Greenman Pederson, Inc (GPI) conducted a literature search of current vessel count and classification methodologies used around the world. They then recommended a list of methodologies to test in a pilot. CS and GPI then organized and conducted a field count and classification effort as the pilot of the methodologies to help gather information and experience in the field.

Findings

The research team examined four methodologies for collecting vessel counts and classifying information, which included: ground-based manual observations, manual observations combined with still photos, ground-based video photography and aerial photography. They found that all four methodologies yielded similar vessel counts, but that only ground-based counts were able to provide reliable vessel classification data at a reasonable cost.

The research team has the following recommendations for NJDOT:

- Develop a classification scheme for state channels, taking into account channel width, the function of the channel in New Jersey’s waterway system, and whether one or more publicly-accessible and technically-suitable vantage points are available on the shoreline;
- Conduct additional tests in a wider range of field conditions to determine (a) which variables affect the accuracy and precision of each count methodology, and to what extent, and (b) which variables affect the use channels by vessel type;
- Develop a set of factors to correct for variables that affect vessel counts and classifications so that count and classification data can be normalized depending on when, where and under what weather conditions the count was conducted;
- Develop a pre-survey field guide and checklist to match suitable count methodologies to known field conditions at each channel (including the weather forecasted for the survey day) and inform logistical preparations;
- Develop a Marine Transportation System data collection program that establishes approved methodologies, procedures, collection techniques, and a proposed channel collection schedule;
- To support post-processing, NJDOT should coordinate with the New Jersey State Motor Vehicle Commission to match vessel registration data collected in the field to attributes associated with that registration number, including vessel classification, age, and place of registry;
- NJDOT should determine what information, in addition to channel count and classification data, are needed to support asset management-related decision making on New Jersey’s Marine Transportation System.

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A final report is available online at: <http://www.state.nj.us/transportation/refdata/research/>. If you would like a copy of the full report, send an e-mail to: Research.Bureau@dot.state.nj.us.

**Channel Usage Research and Analysis
NJDOT Research Report No: NJ-2015-002**