Navigating Possibilities: Unlocking Tennessee's Waterways for Interstate Freight Transportation

Presented by:
Jeffrey Trombly, Ph.D.
Assistant Professor of Practice
Department of Supply Chain Management
University of Tennessee Knoxville

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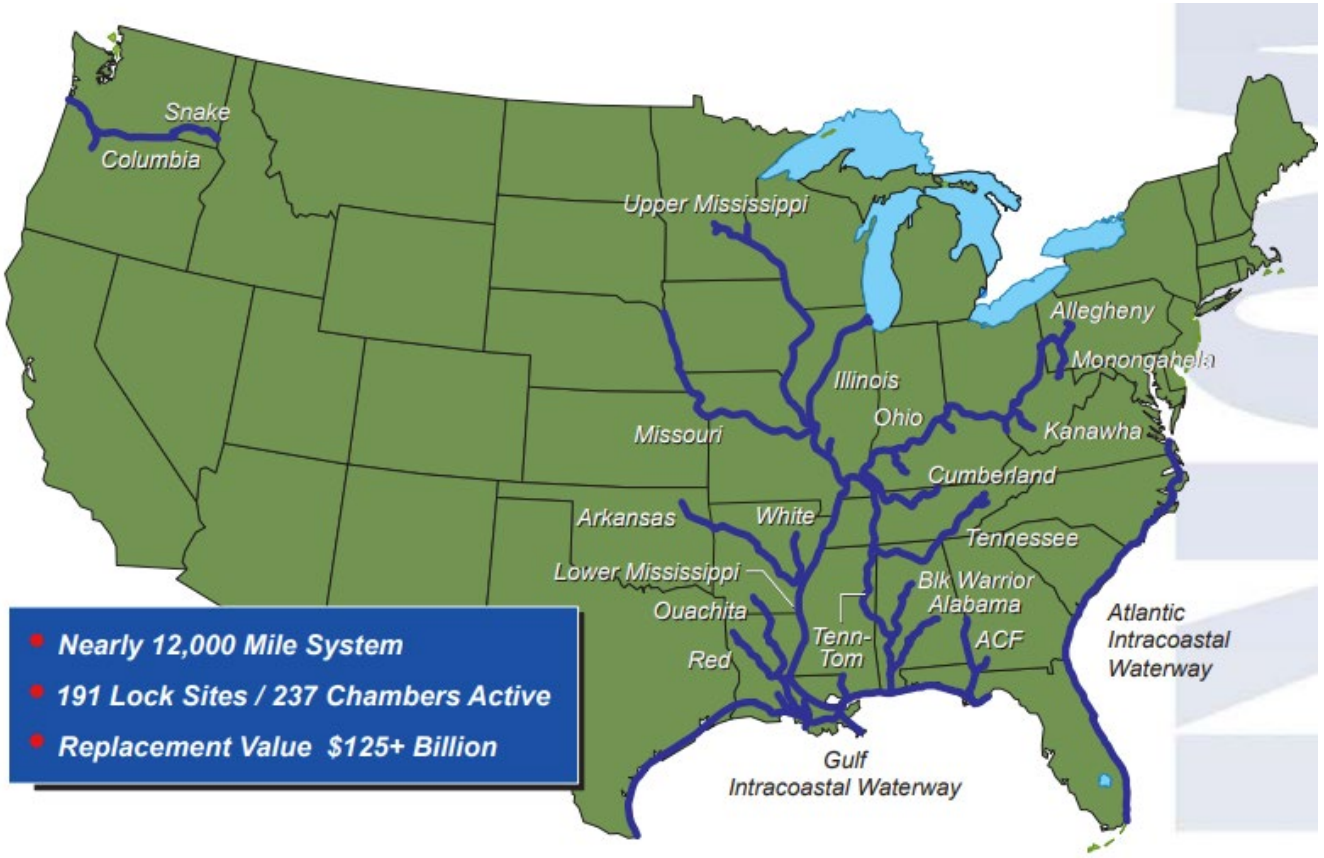
Project Overview

- **Goal:** Assess the feasibility and economic potential of increasing barge transportation through Tennessee ports.
- **Geographic Scope:** Great Lakes → Tennessee River system → Gulf of Mexico.
- **Key Research Findings:**
  - Technical feasibility
  - Economic cost-benefit assessment
  - Challenges and mitigation strategies
  - Alternative route/mode evaluation
  - Strategic recommendations

Project Tasks

- **Task 1:** Feasibility of utilizing the route from the Great Lakes to the Gulf of Mexico via the Port of Knoxville and other key State Port Facilities for Barge Traffic.
- **Task 2** – Assess the Associated Costs and Potential Economic Benefits
- **Task 3** – Identify Potential Challenges and Develop Strategies to Address These Challenges
- **Task 4** – Explore Alternative Routes and Modes
- **Task 5** – Provide Recommendations Based On Findings from the Feasibility Study

Waterway System Network



Waterway Transportation Benefits and Challenges

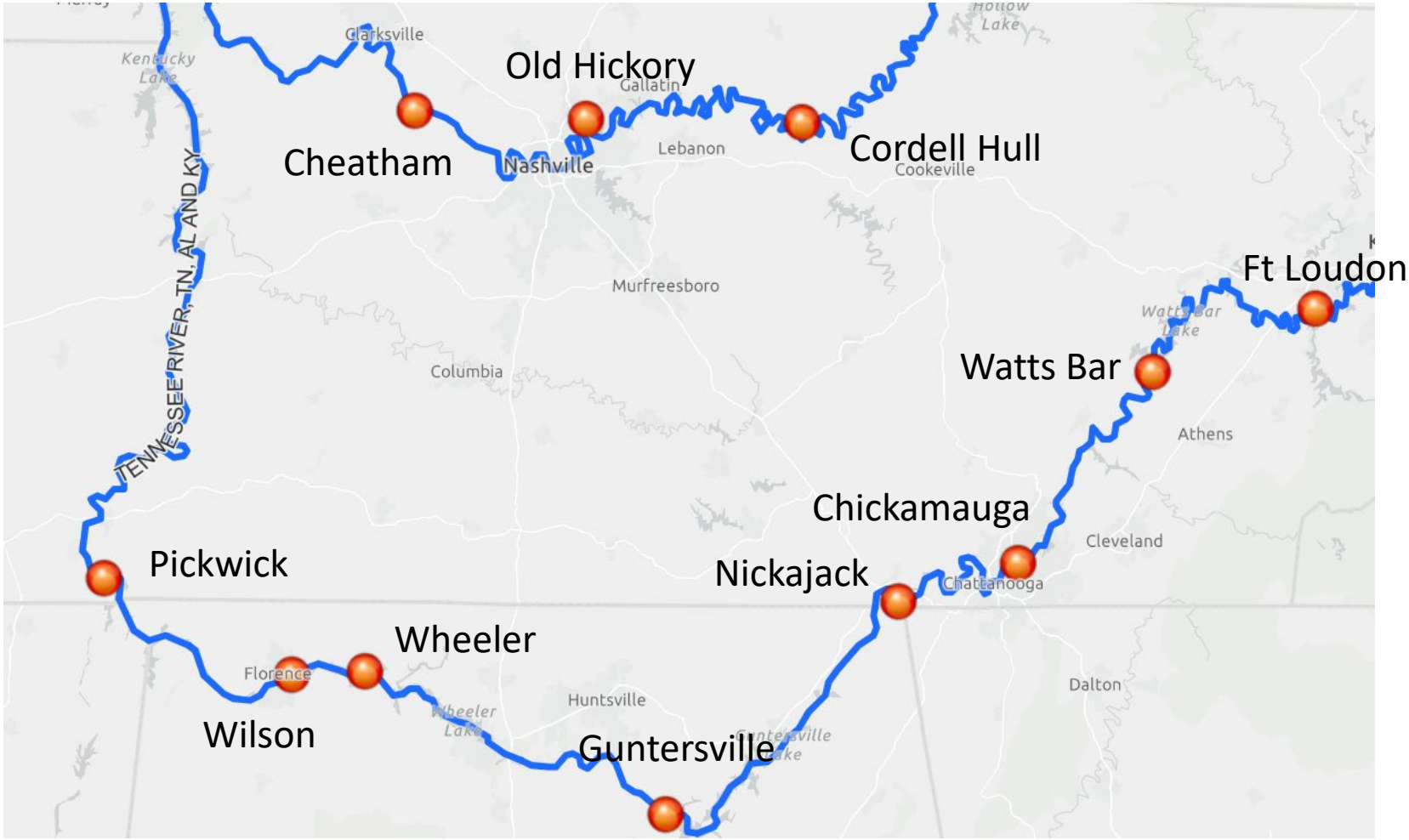
Benefits

- Low cost
- Large carrying capacity
- Low emissions and energy consumption
- Safety

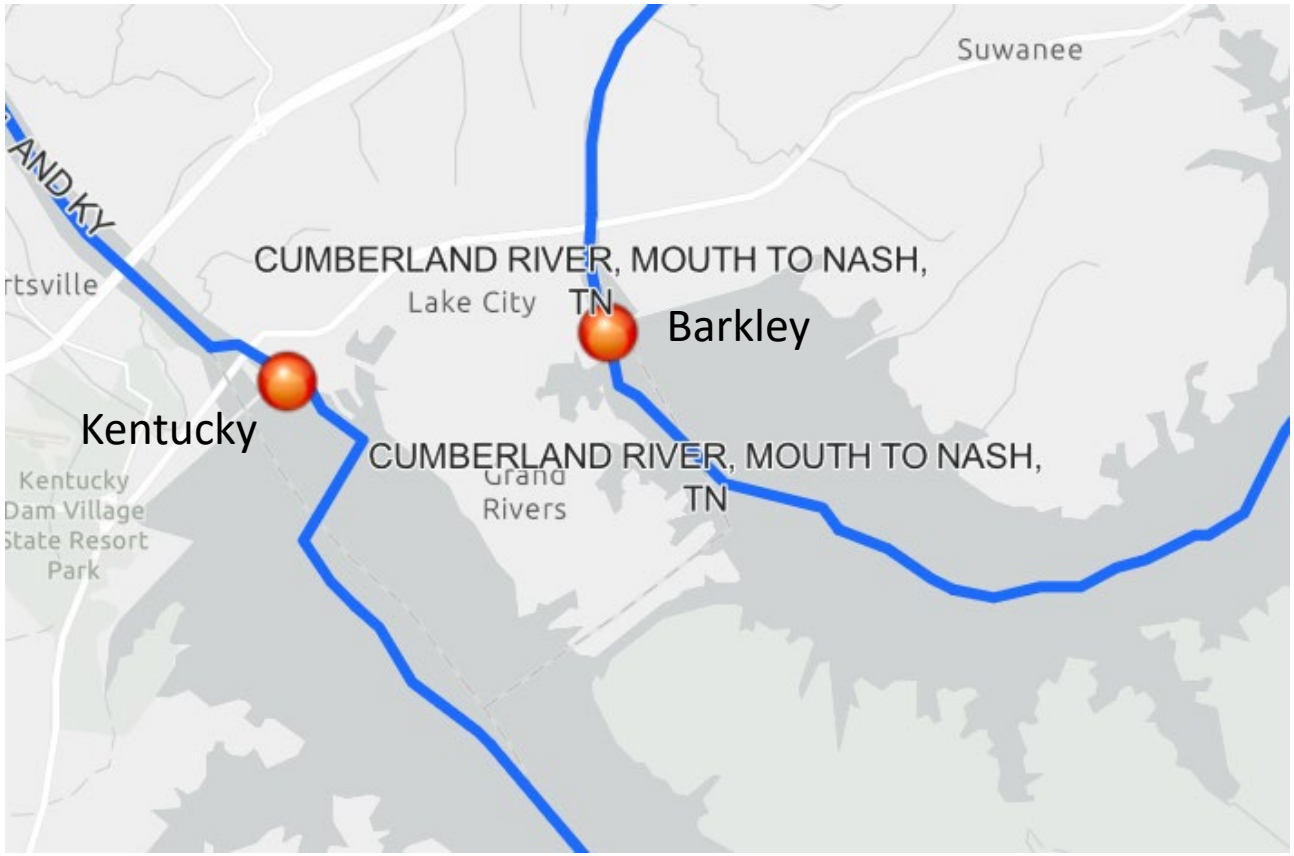
Challenges

- Lead times
- Aging infrastructure
- Funding
- Handling equipment
- Market demand
- Weather and water level variability

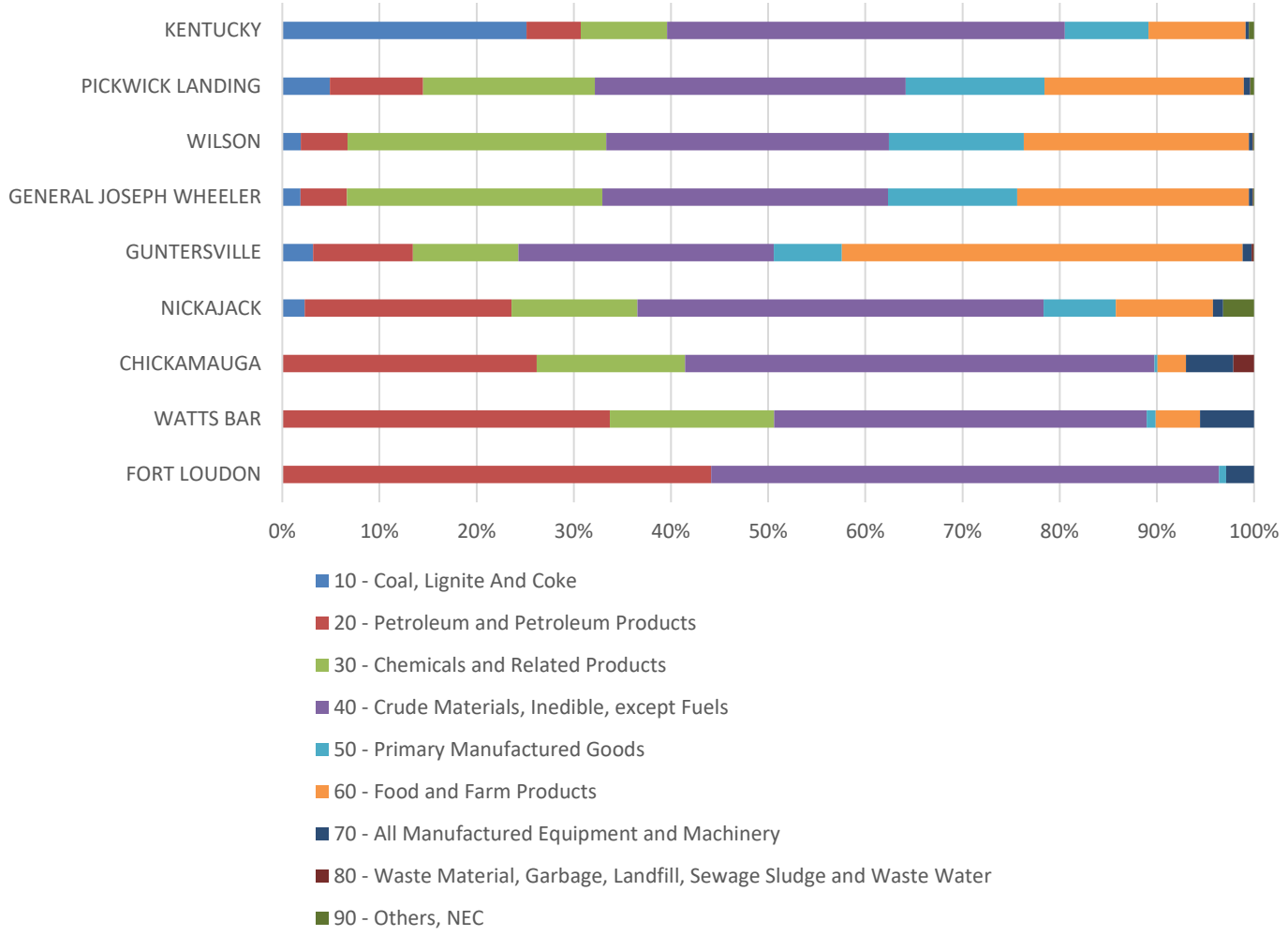
Tennessee Locks and Dams



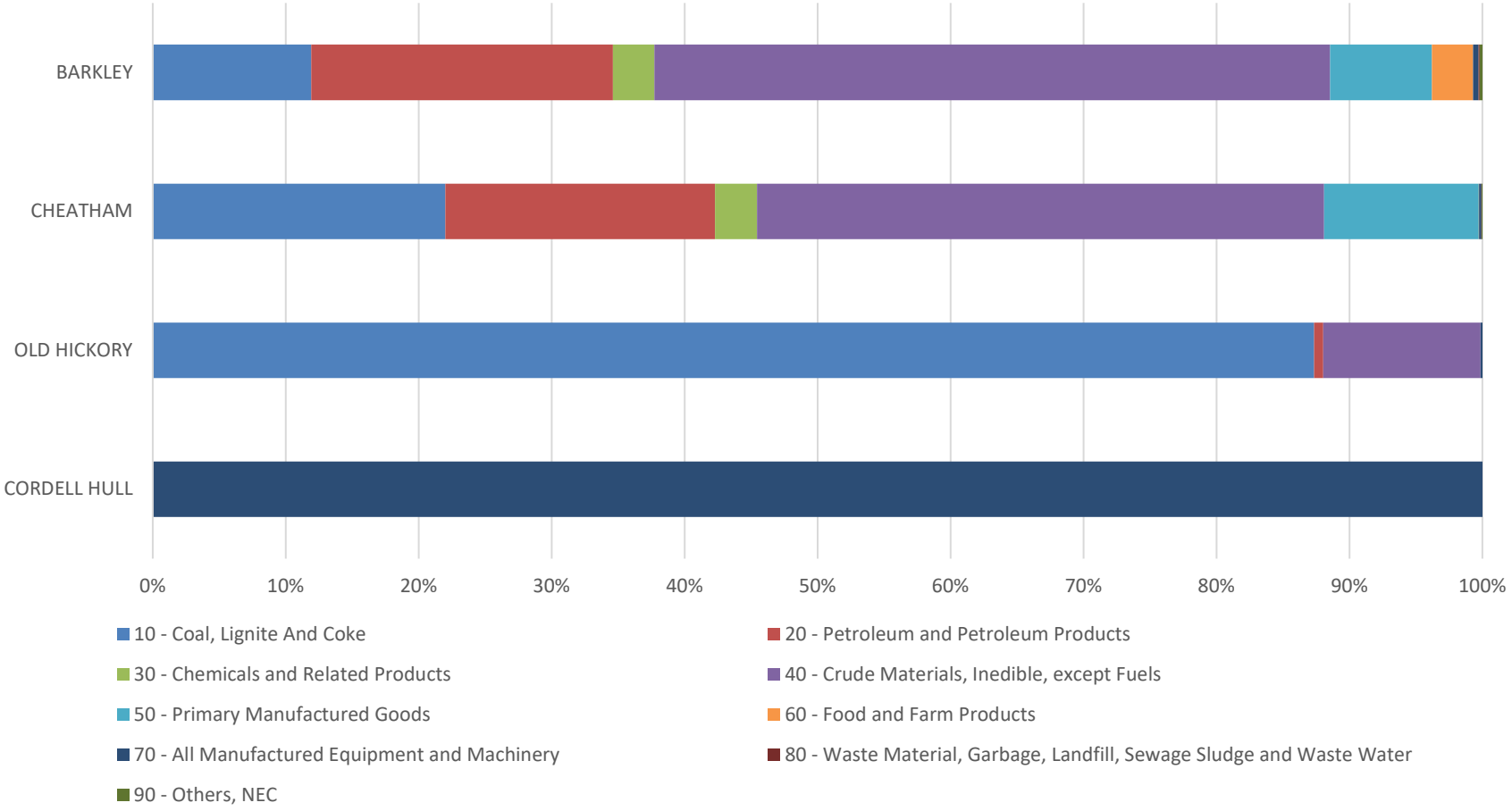
Barkley and Kentucky Locks



Tennessee River Commodities



Cumberland River Commodities



Cost and Environmental Performance

- **Cost**: Water transport costs per ton-mile are 61.7% lower than rail and 81.9% lower than road.
- **Emissions**: Water transport has 30.1% lower CO2 emissions per ton-mile than rail and 89.3% lower emissions than road.
- **System-Wide Benefits**: A shift to water transportation can reduce total CO2 emissions. For example, a scenario with a 25% road cost increase resulted in a system-wide CO2 reduction of 44,901 tons, which has a social value of $5.39 million.

Market and Economic Outcomes

- **Market Response**: Water transportation gains freight when road costs increase.
  - For example, a 25% road cost increase scenario led to water transportation capturing an 8.50% increase in tonnage.
- **Revenue and Cost**: The system has a baseline annual revenue of $1.77 billion.
  - For a 25% road cost increase, waterway revenue increase was $158.9 million. In the same scenario, total system costs decreased by $1.56 billion.
- **Efficiency**: When water gains market share, the overall transportation system becomes more efficient.
  - In the 25% road cost increase scenario, the system's average cost per ton-mile dropped to $4.77 from a baseline of $4.82.

Key Commodities

- **Commodities**: The largest commodity by tonnage for water transport is **Gasoline, Aviation Turbine Fuel, and Ethanol**.
  - Other commodities with large market shares include **(Crude Petroleum)** and **(Metallic Ores and Concentrates)**.
- **Investment Opportunities**: The data points to investment opportunities in specific commodities.
  - **(Gasoline, Aviation Turbine Fuel, and Ethanol)** is the top opportunity, with a potential revenue of $28.7 million in a 25% road cost increase scenario.

Key Service Characteristics

- **Back-haul Demand:** The availability of freight demand to fill back-haul movements increases service availability for shippers and revenue per ton-mile, for operators.
- **Ocean Carrier Coordination**: Schedule coordination between ocean carriers and inland barge operators improves intermodal connectivity, lowers storage costs, and improves transit time reliability

Policy Implications and Strategic Recommendations

1. Port Infrastructure Enhancement

- **Priority**: Enhance capacity for high-value energy commodities
- **Investment Focus**: Modernize loading/unloading facilities for petroleum products and refined fuels

2. Intermodal Connection Improvements

- **Priority**: Improve rail-water and road-water transfer facilities
- **Investment Focus**: Develop seamless intermodal hubs at key transfer points

Policy Implications and Strategic Recommendations

3. Funding Advocacy

- **Priority**: Ensure adequate funding for maintenance and improvements
- **Focus**: Highlight water's role in reducing system costs and environmental impacts

4. Economic Development

- **Priority**: Attract businesses that can benefit from water transportation including energy, mining, and bulk commodity industries
- **Focus:** Promote water transportation advantages in business attraction efforts

Policy Implications and Strategic Recommendations

5. Data and Modeling

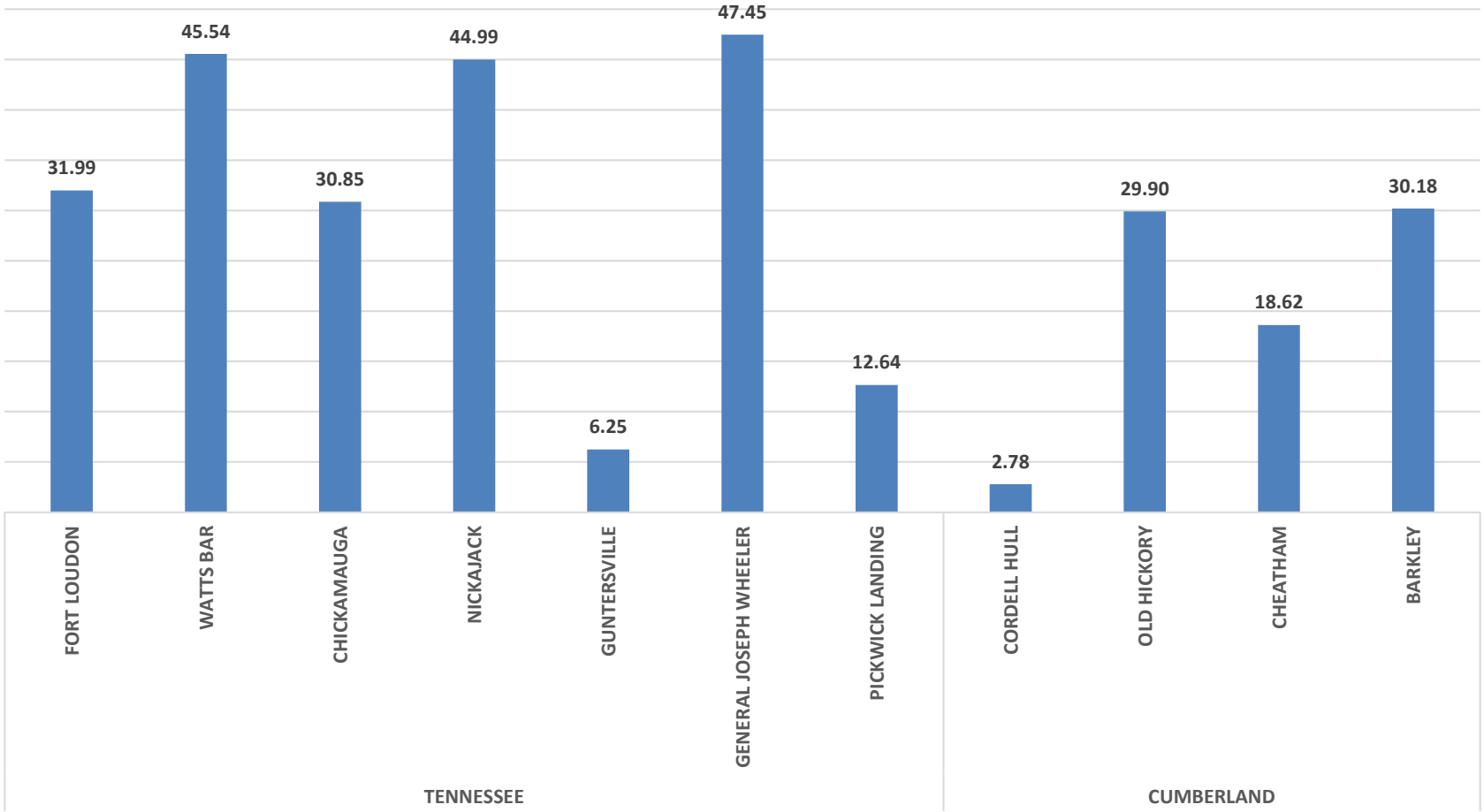
- **Priority**: Enhanced data gathering and modeling capability to evaluate policy impacts
- **Focus**: Develop multimodal data and modeling capacity to analyze policy options

6. Waterway System Advocacy

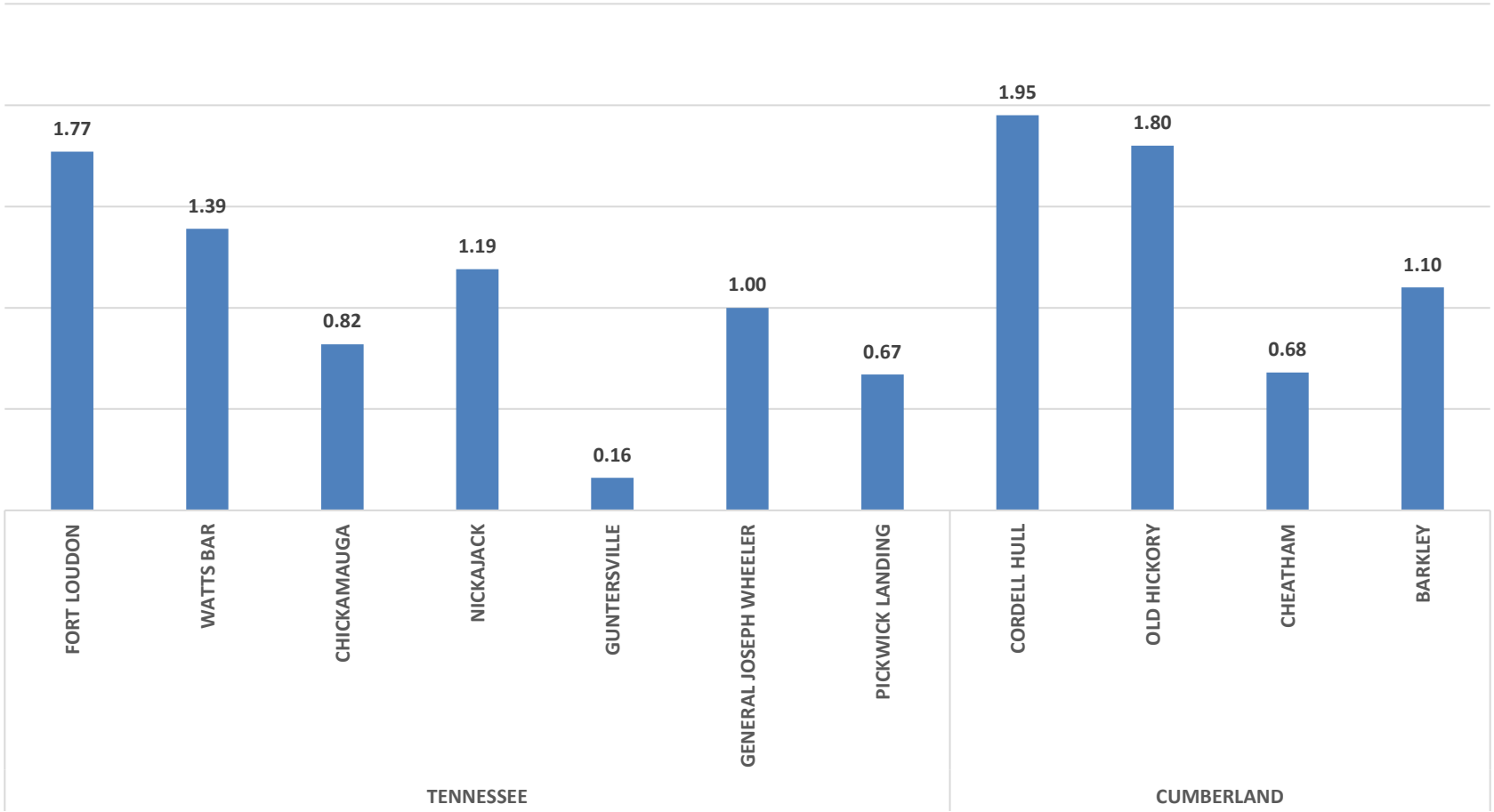
- **Priority**: Raise awareness of waterway transportation system opportunities
- **Focus**: Develop port and waterway council to advocate for waterway system among stakeholders

SUPPLEMENTAL SLIDES

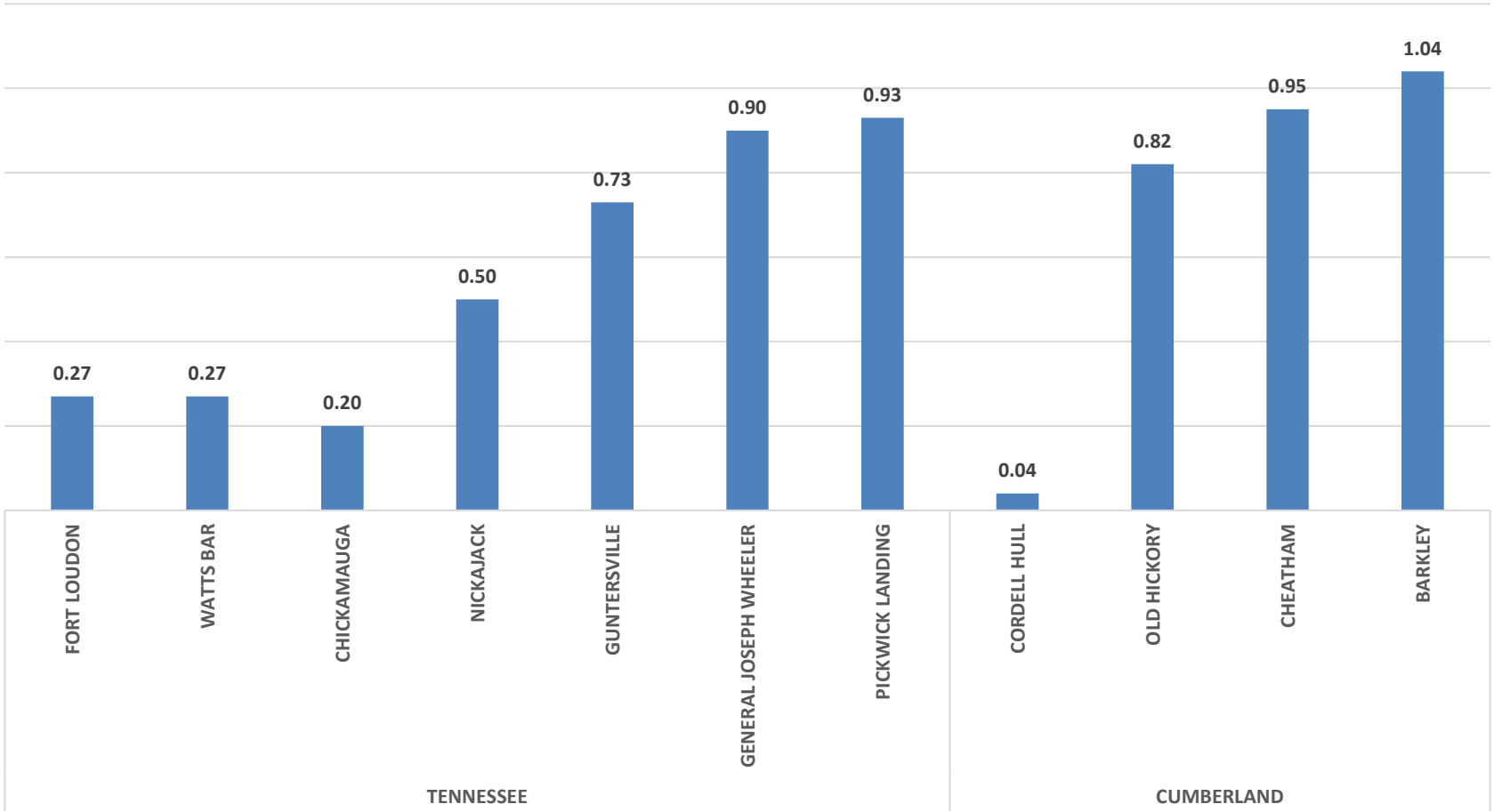
Average Percent Vessels Delayed - 2024



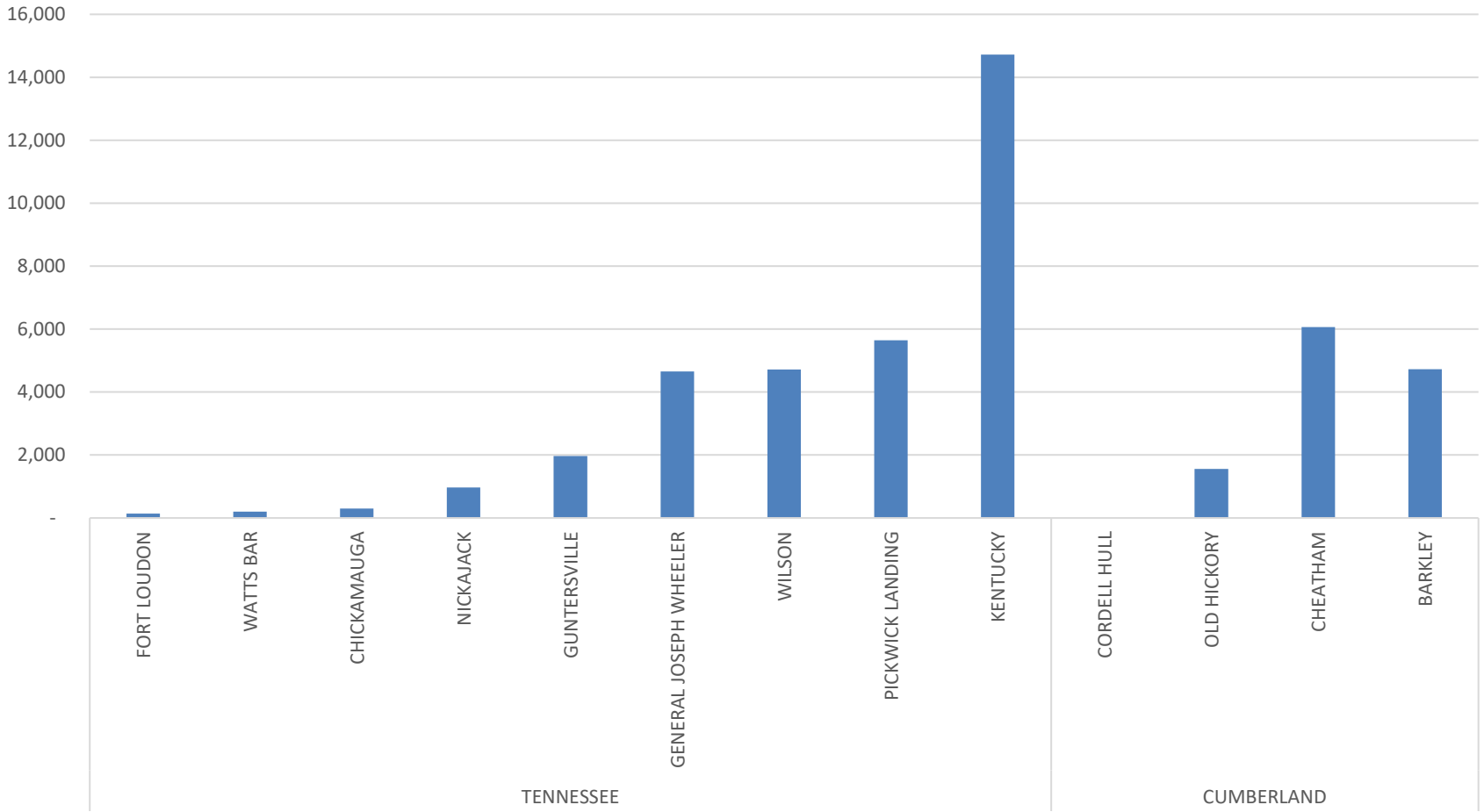
Average Tow Delay (Hours) - 2024



Average Processing Time (Hours) - 2024



Loaded Barges - 2024



Fort Loudon Lock

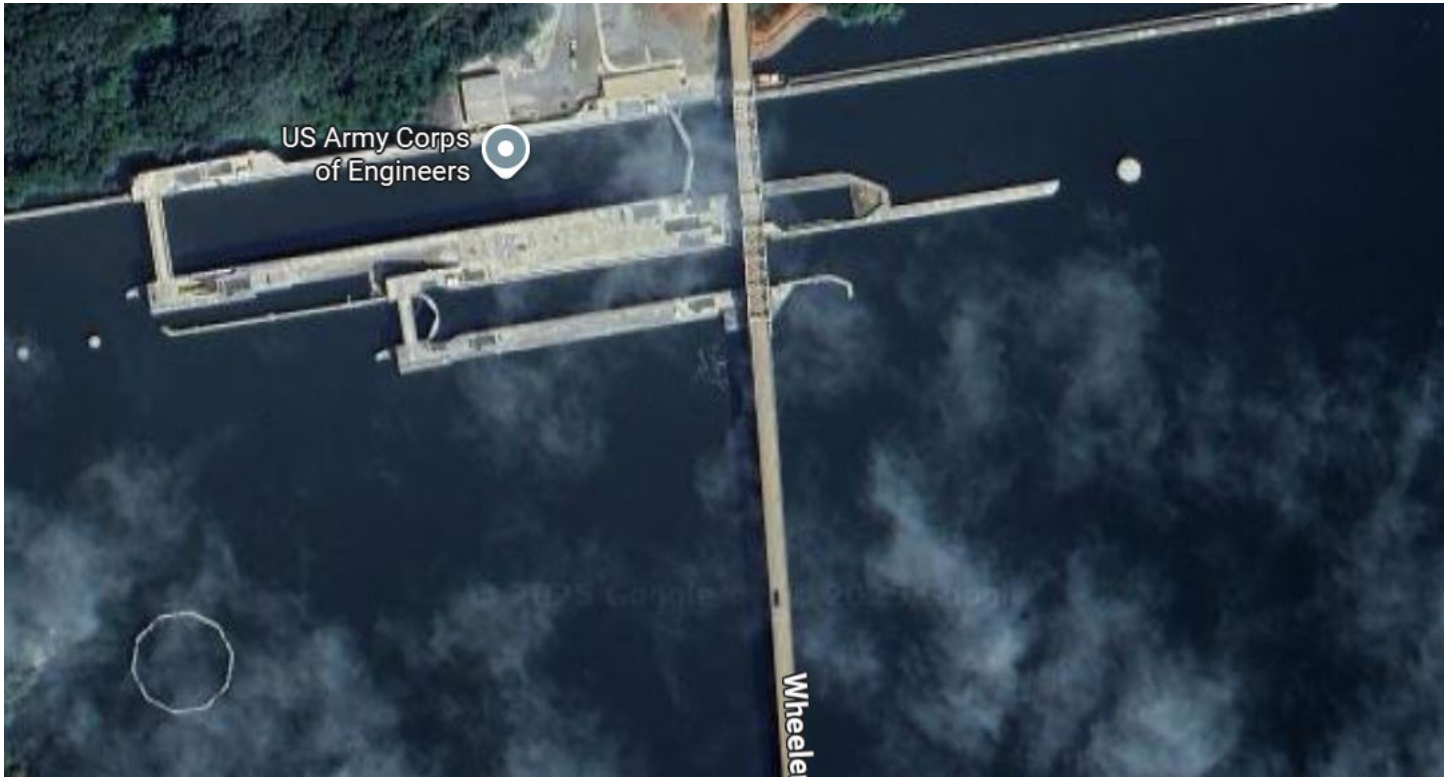
Watts Bar Lock

Chickamauga Lock

Nickajack Lock

Guntersville Lock

Wheeler Lock



Wilson Lock

Pickwick Lock

Kentucky Lock

Old Hickory Lock

Cheatham Lock

Barkley Lock