



ODU Research: An Overview and Its Context

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VP Research

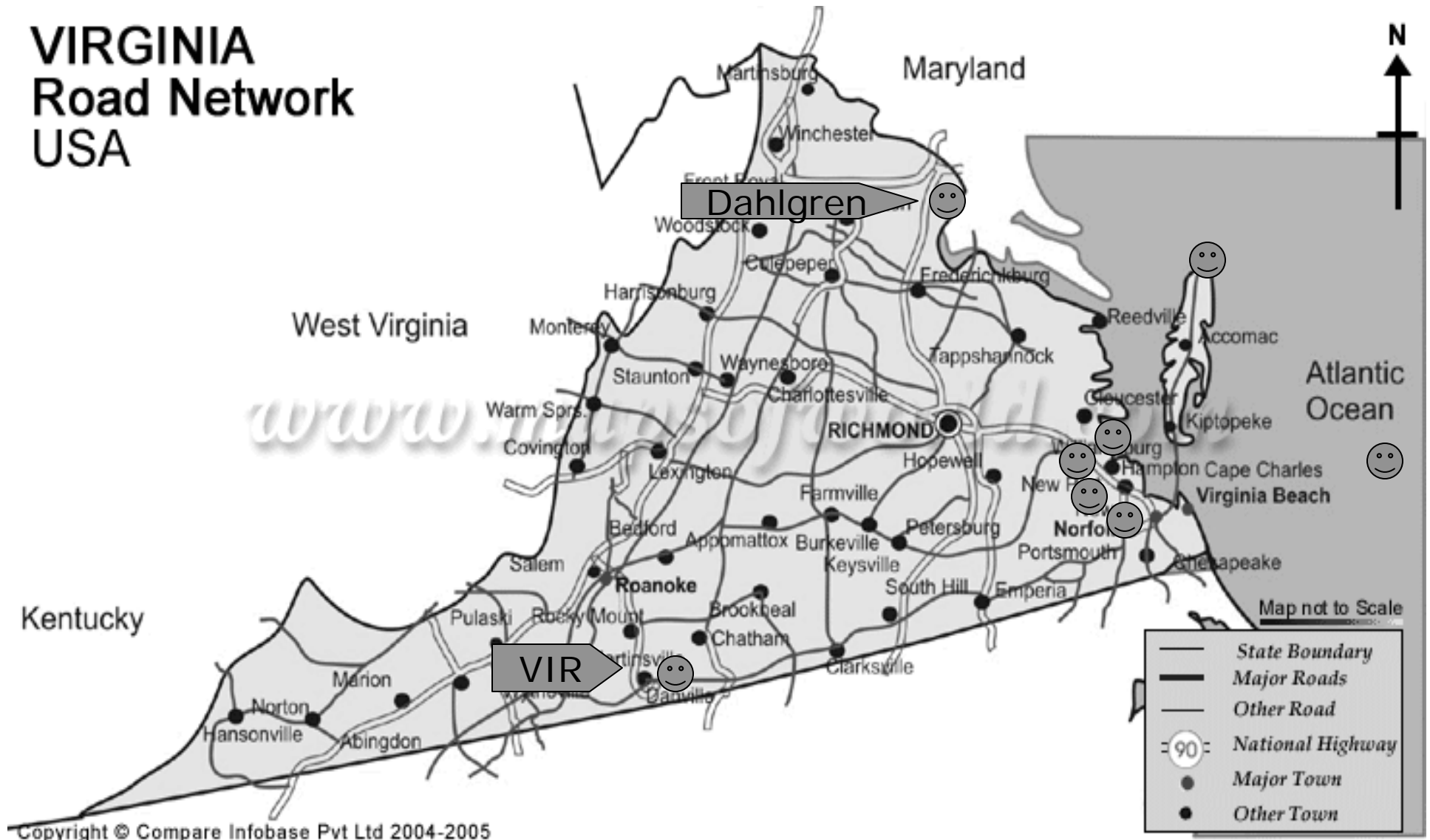
January 21, 2008

 Old Dominion UNIVERSITY

Changing Lives

ODU Research Reach

VIRGINIA
Road Network
USA



Thomas Jefferson National Accelerator Facility

ODU Physics Group is a major partner in Nuclear Experiment Research

- **Share Key Research Personnel**
- **Support Graduate Research**
- **Construction of Large Detector Elements**



CEBAF Large Acceptance Spectrometer

APPLIED RESEARCH CENTER

Thomas Jefferson National Laboratory and the Free Electron Laser

- 
- **Microelectronics Laboratory**
 - **Access to World's Most Powerful Free Electron Laser**

Microelectronics and Material



- Nano-Particles
- Nano-Electronics
- Sensors
- Surface Structures
- Diagnostics
- Condensed Matter
- Nuclear Physics
- Plasma

- COSMIC
- ARC

Environment

- Physical Oceanography
- Marine Life & Habitat
- Coastal Engineering
- Biogeochemistry
- Corrosion
- Ocean History





**Went up over 40%
In 2-1/2 yrs**

Study revealed that VMASC alone is responsible for contributing to \$413M in Total Regional Economic Output and \$248M net to the gross regional product.
(December 7, 2004)

VMASC

(Virginia Modeling Analysis & Simulation Center)

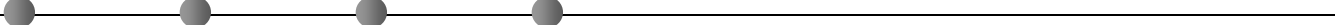
- 10 Academic**
- 17 Affiliate**
- 27 Government**
- 118 Industry**
- =====**
- 172 Member Partners**

EMTASC
(A Private-ODU entity)
Inaugurated
On
August 31,
2005





MS&V Clusters

- 
- Military Simulations – Battle Lab
 - Serious Gaming – Education Applications
 - Transportation – Mass Evacuation
 - Medical Modeling – Virtual Surgery
 - Critical Infrastructure Resilience
 - Social Networking – Crowd, Riots

Economic Impact of M&S on Hampton Roads

<u>Factor</u>	<u>2004</u>	<u>2007</u>	<u>% Change</u>
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REMI Model Version 5.5

Total Output	\$412.9M	\$639.5M	+54.9%
Regional Product	\$248.0M	\$408.1M	+64.4%
Employment	4,023	5,092	+26.6%
Average Salary	\$60.2k	\$82.7k	

REMI Model Version 8.0

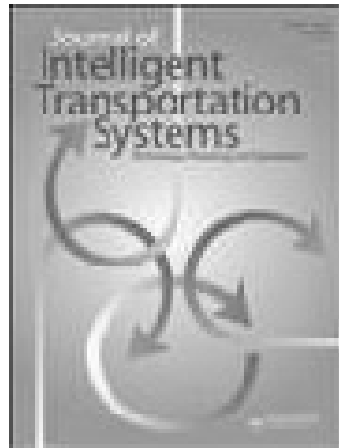
Total Output	\$258.4M	\$364.6M	+41.1%
Regional Product	\$167.3M	\$237.8M	+42.1%
Employment	3,524	4,420	+25.4%
Average Salary	\$60.2k	\$82.7k	

- Military and industry need more skilled workers to continue growth. Significant growth opportunities exist in non-Defense new market segments.

Sim City, USA



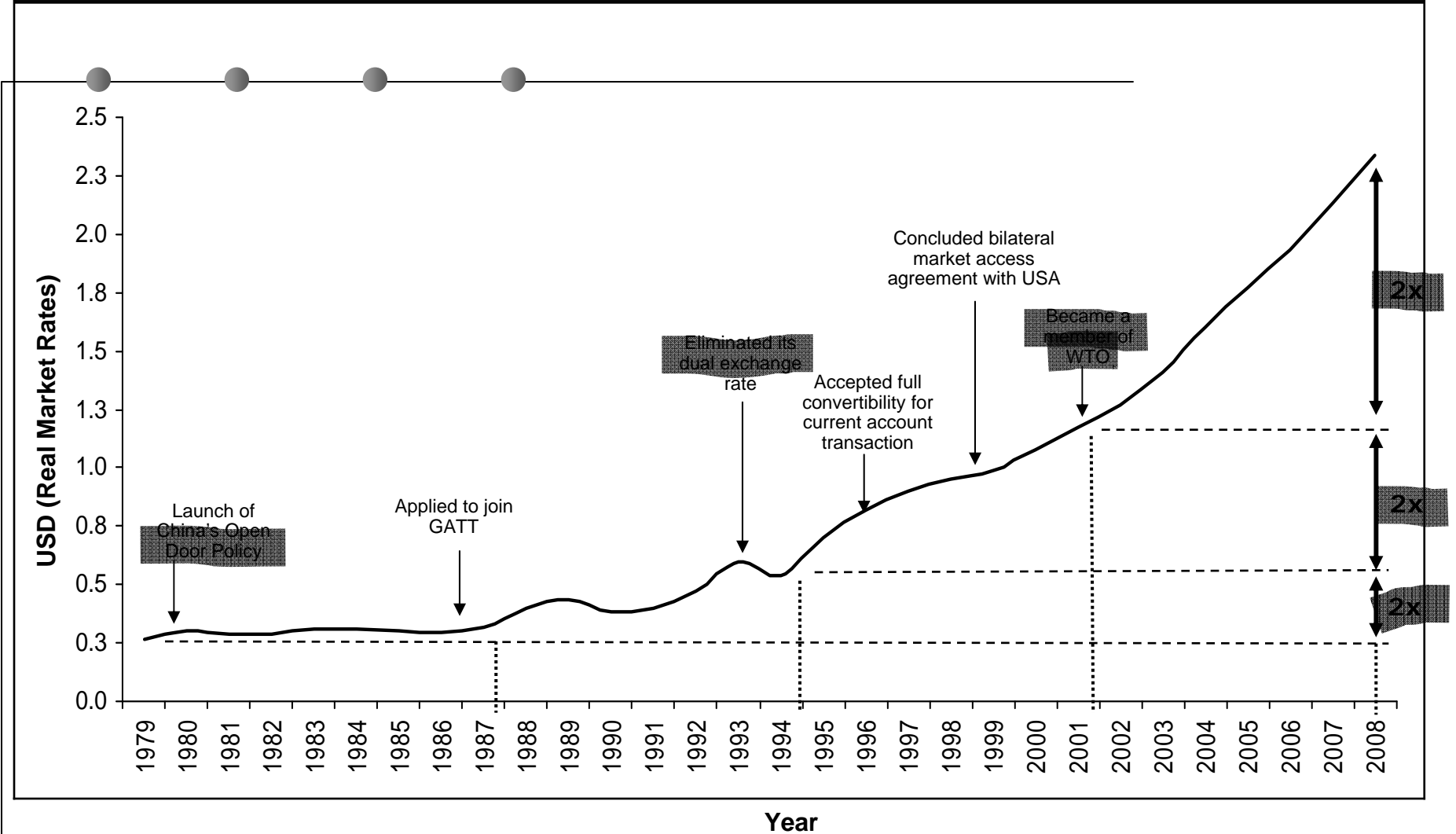
Multi-modal Transportation



- Maglev
- Short-haul air transport
- Port & Supply Chain Logistics
- Sensors Development
- Motor Sports
- High-speed marine craft
- Roads & Highways (e.g., Red light running)
- GIS

China's economy has doubled every 7 years since 1987

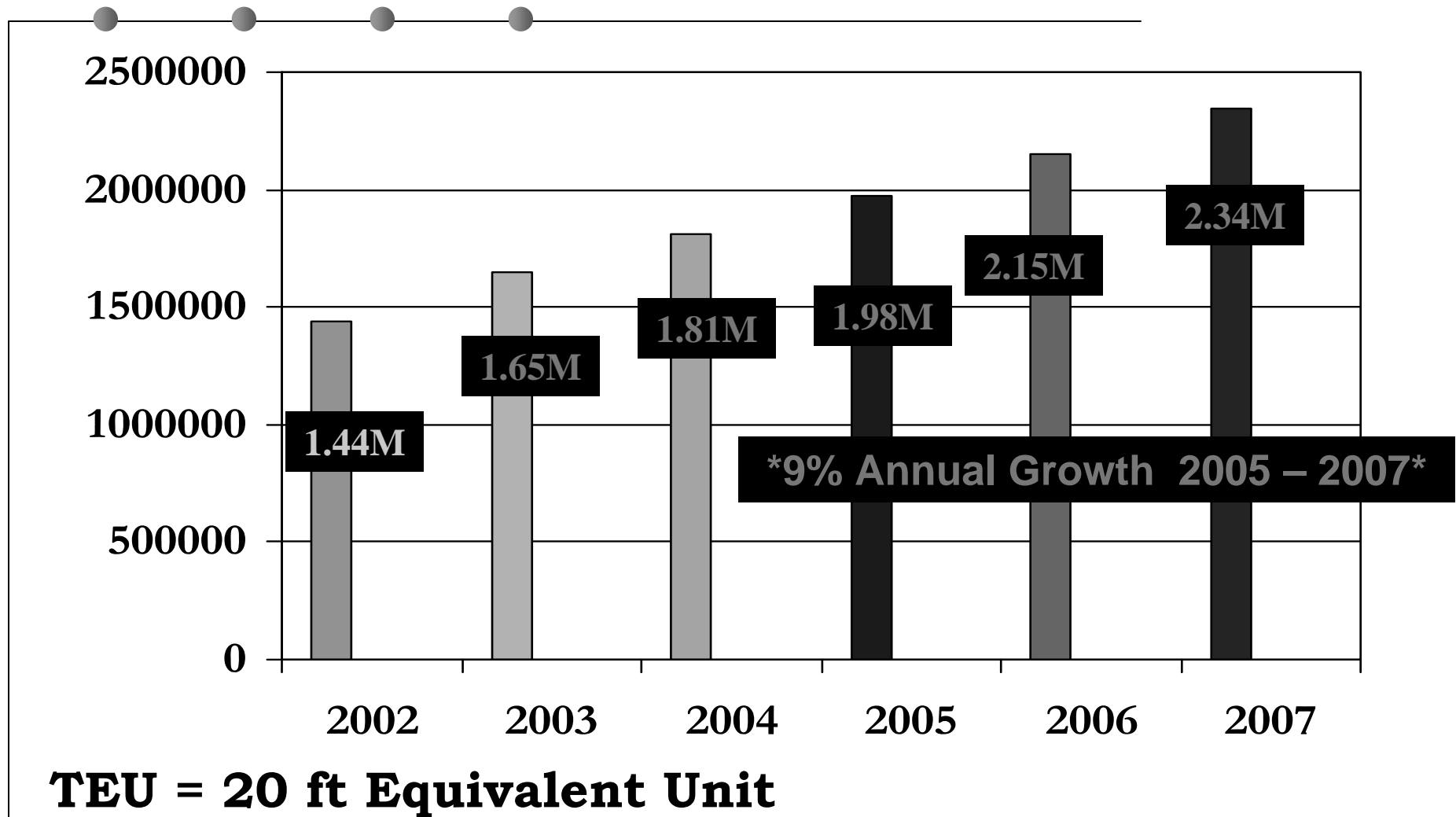
China GDP (USD trillion)



Source: IMF

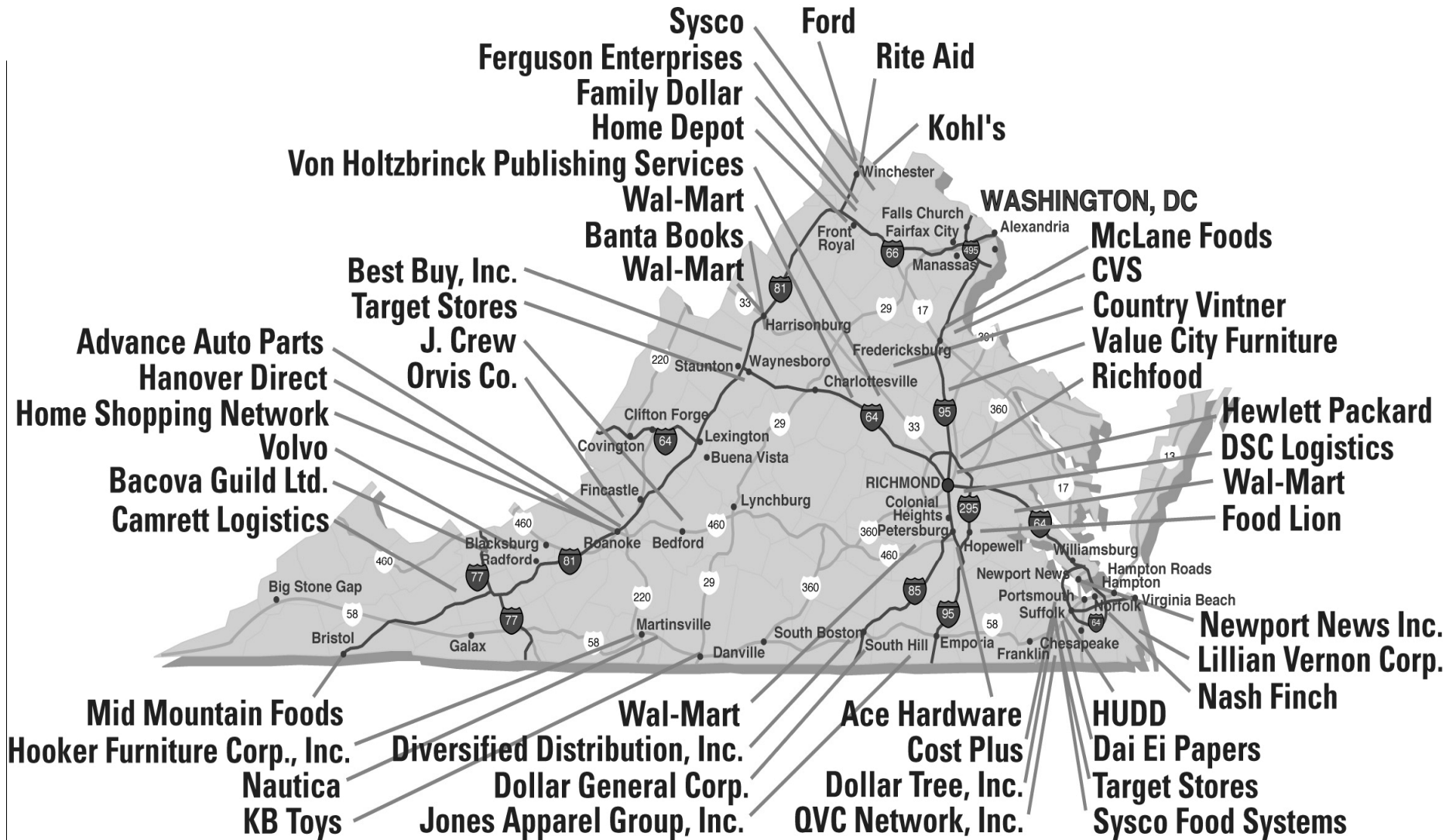


Port of VA: Performance/Forecast

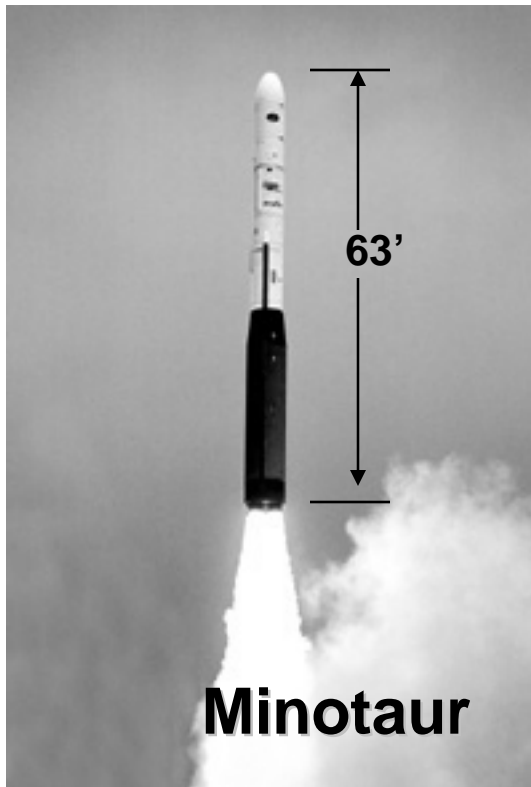


Distribution Centers

Over 80 Distribution Centers located in VA



Mid Atlantic Regional Spaceport (MARS)



Orbital

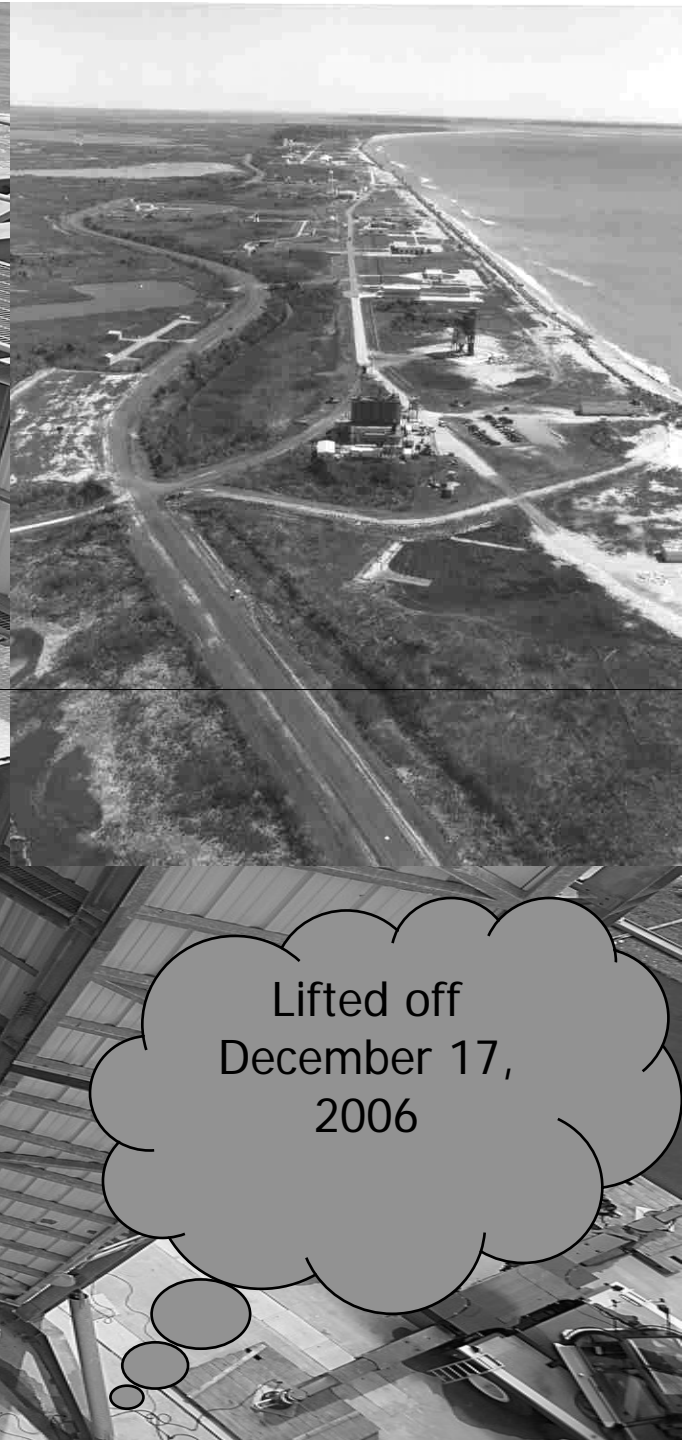
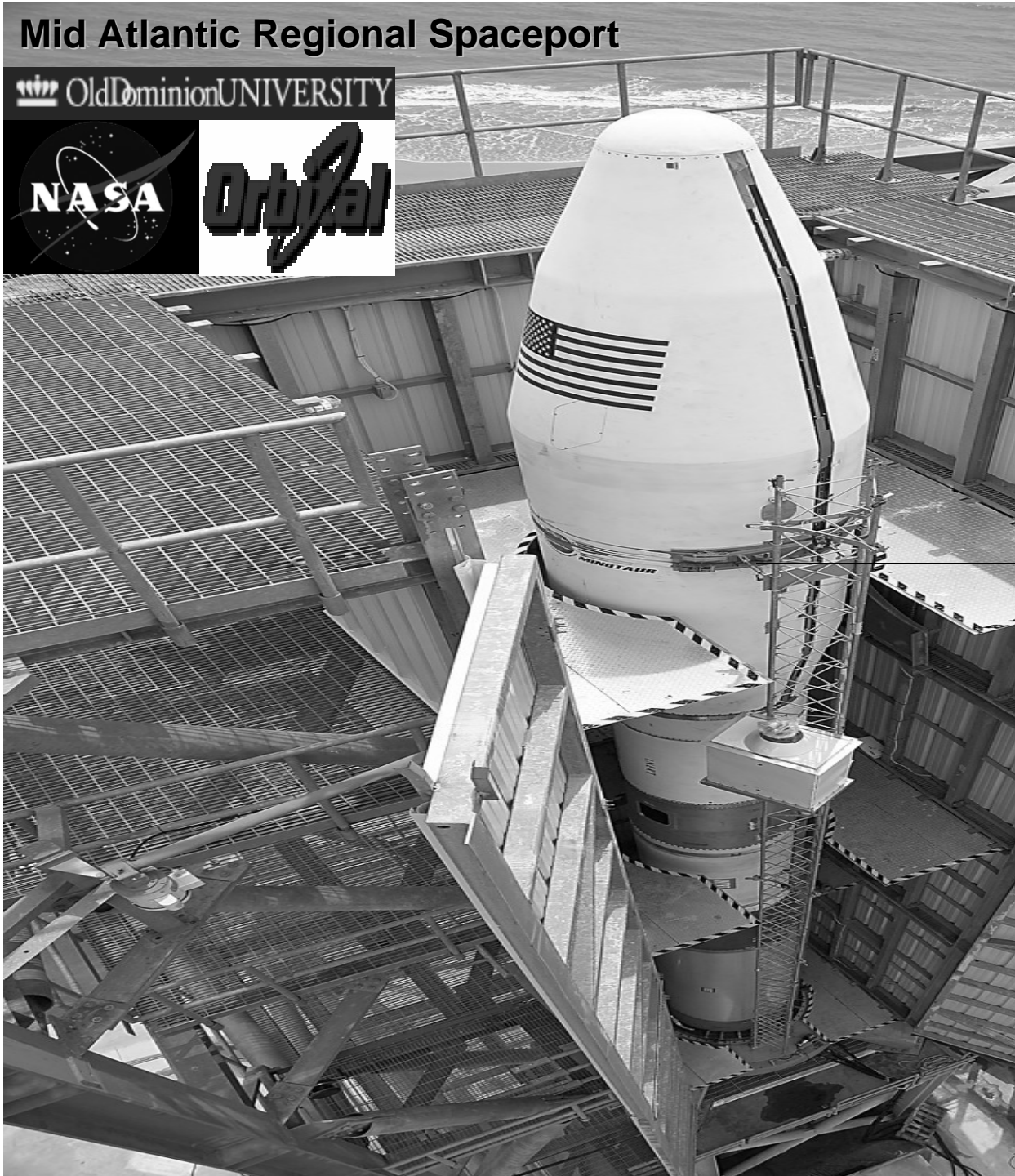
*USAF Launch contract for
Minotaur launch*

- *Four Stage Launch Vehicle*
- *Up to 1,000 lbs*
- *Launch pad upgrade*

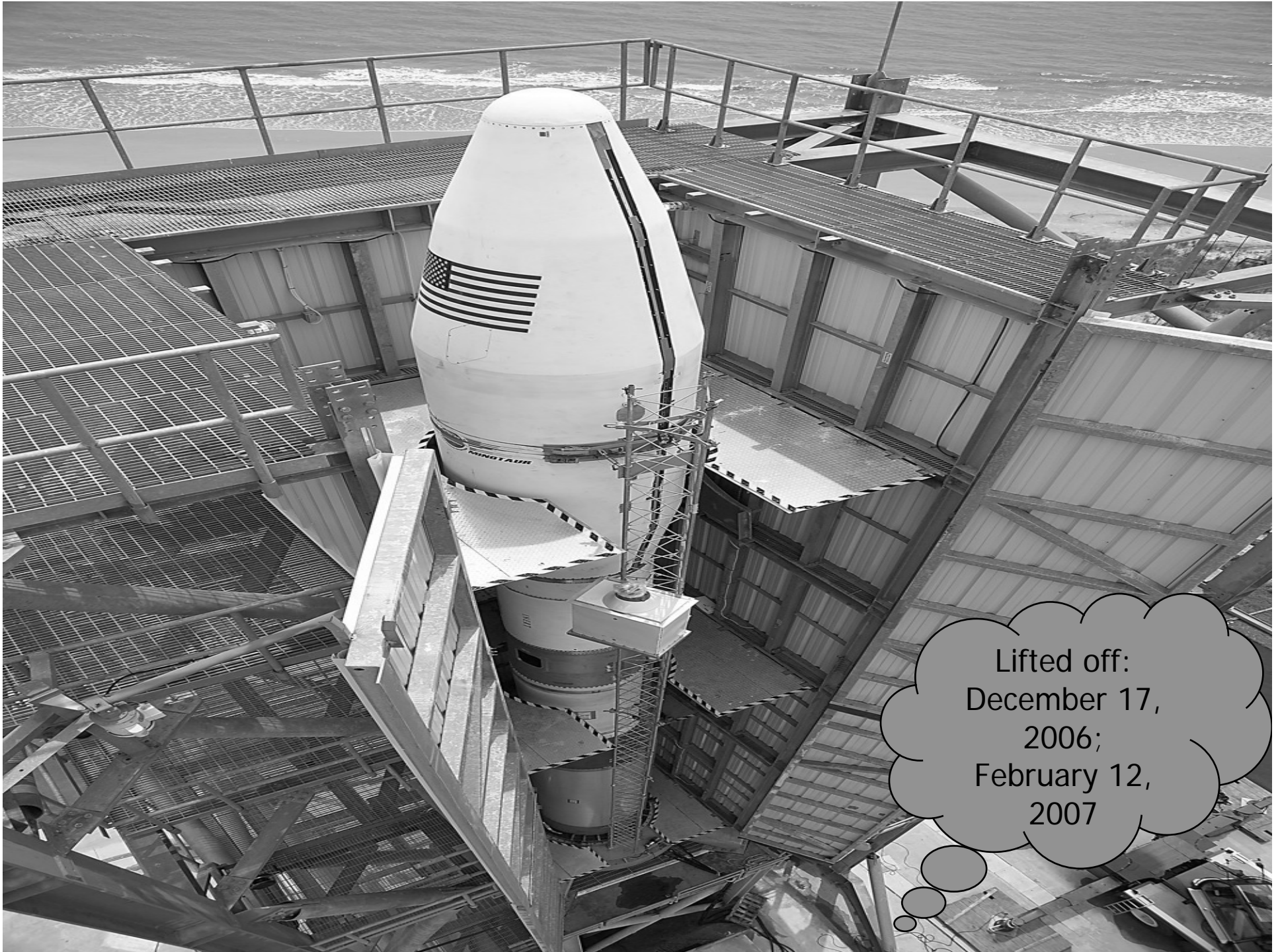


Mid Atlantic Regional Spaceport

Old Dominion UNIVERSITY



Lifted off
December 17,
2006



Lifted off:
December 17,
2006;
February 12,
2007

World's Largest University-Run Wind Tunnel



Motor sports and Ground Vehicles

- NASCAR
- Sports cars
- Open wheel-IRL and CART
- Craftsman Truck to Class 8 Trucks!

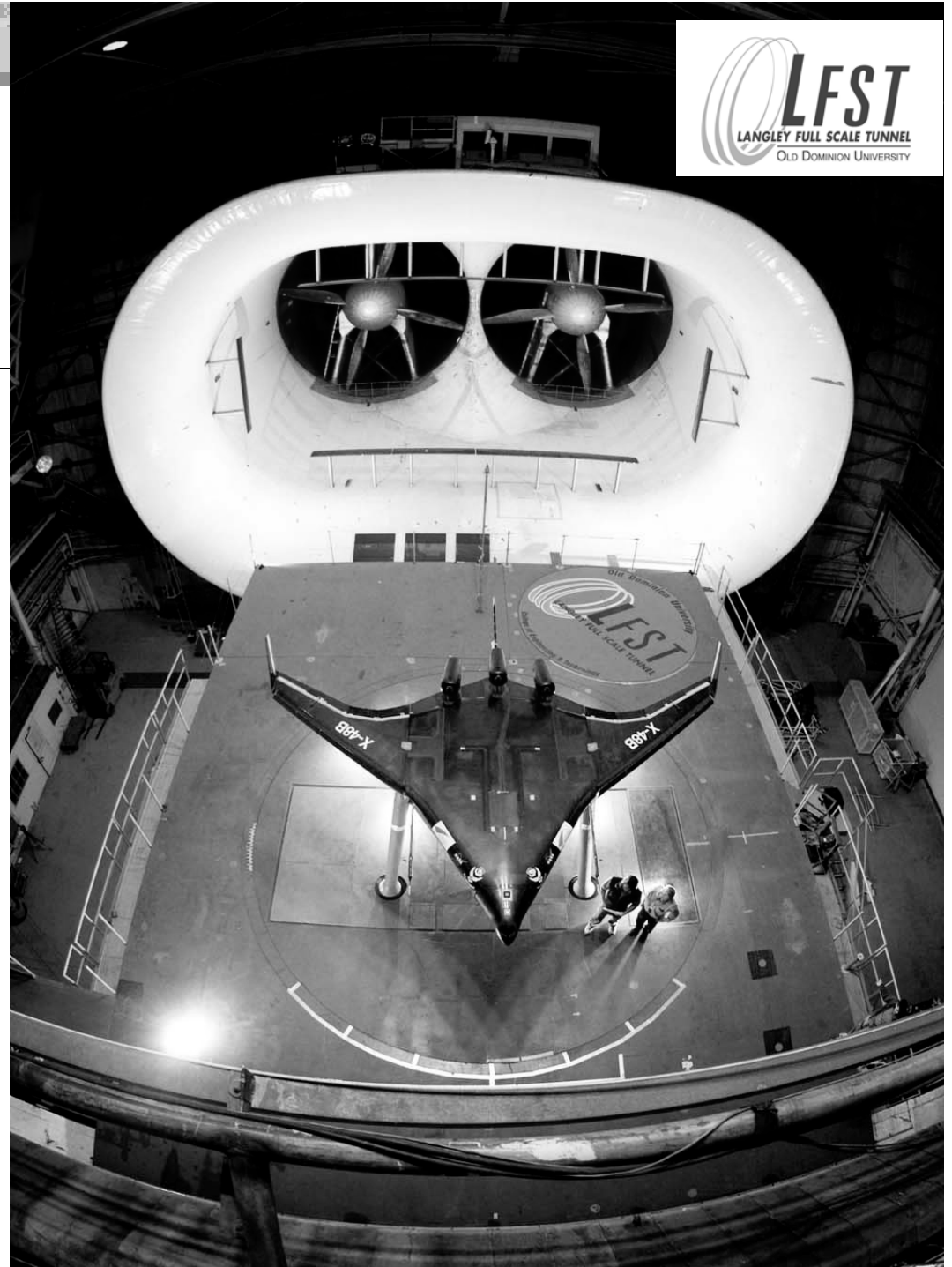


The Langley Full-Scale Tunnel (LFST)

The largest University-operated wind tunnel in the world



- Large-scale aerodynamic testing
- Aerodynamic analysis, inc. CFD
 - Model fabrication and instrumentation

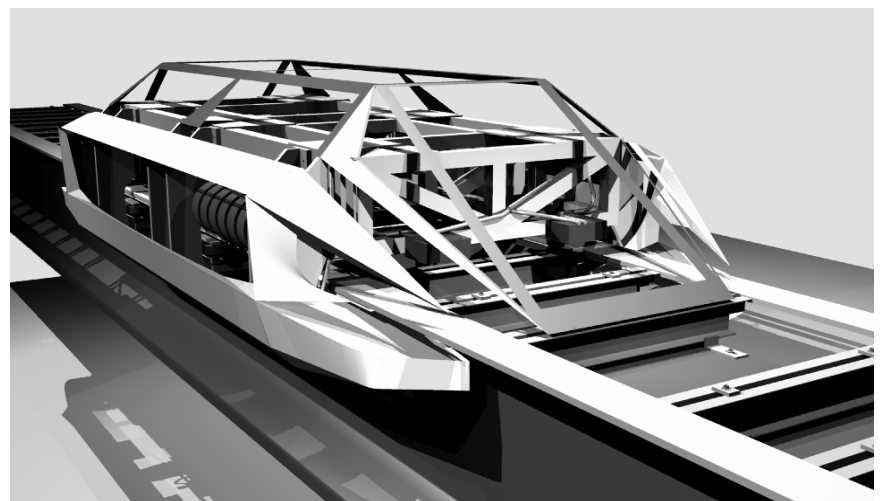


Aerodynamic Testing of Airborne Refueling of UAV by KC-135 Tanker



ODU Maglev

- Designed Test Bogie based on decentralized control (05/06).
- Levitated and stabilized in laboratory (08/06).
- Propelled Test Bogie on guide way (10/06).
- Next: speed profile execution; test/evaluate emergency braking; station acquisition; safety systems; passenger vehicle design; certification.



ODU Maglev Guideway

Webb Station

Initial
Levitation

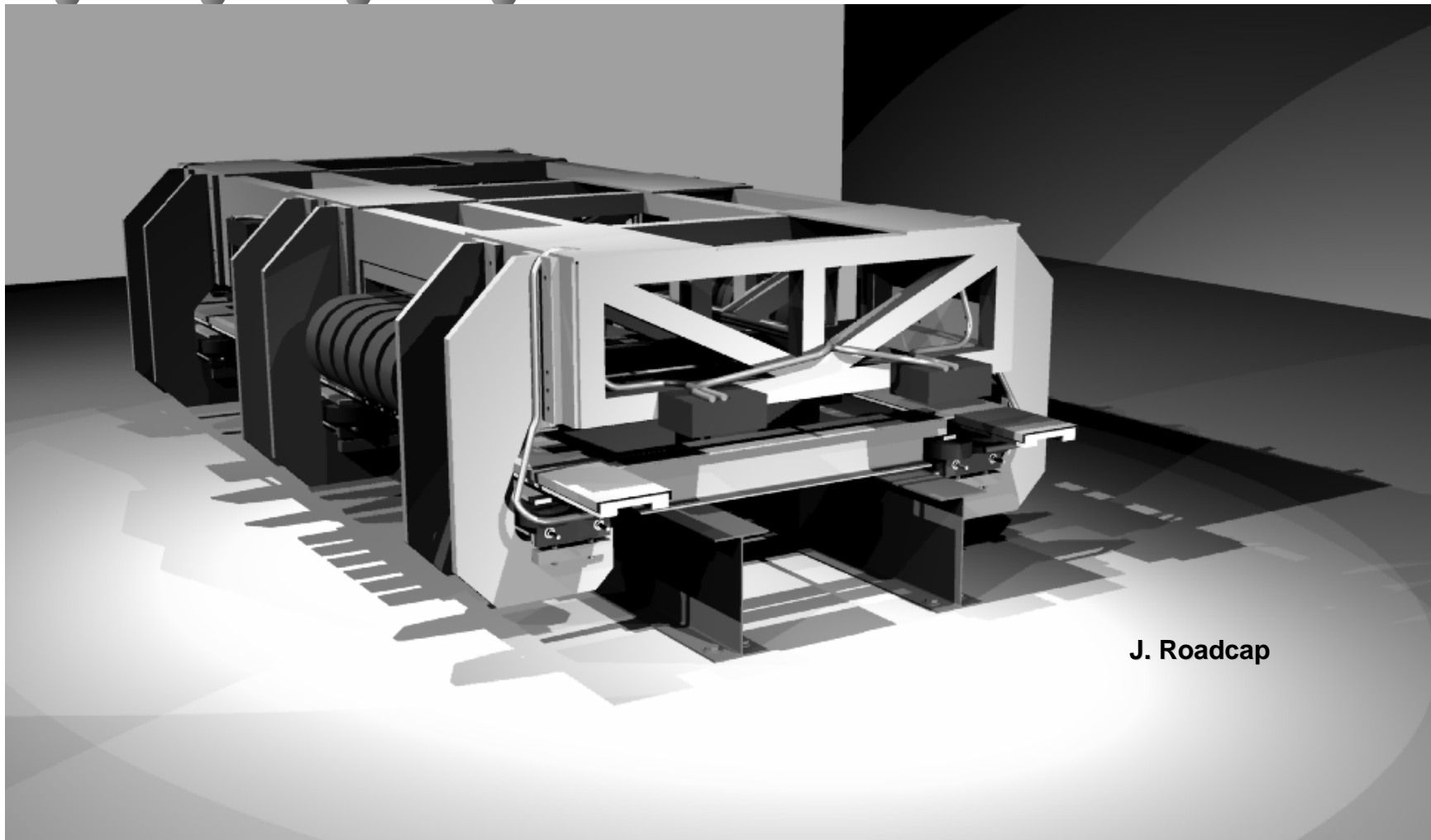
3400 ft.

Powhatan Avenue

Hampton Blvd.

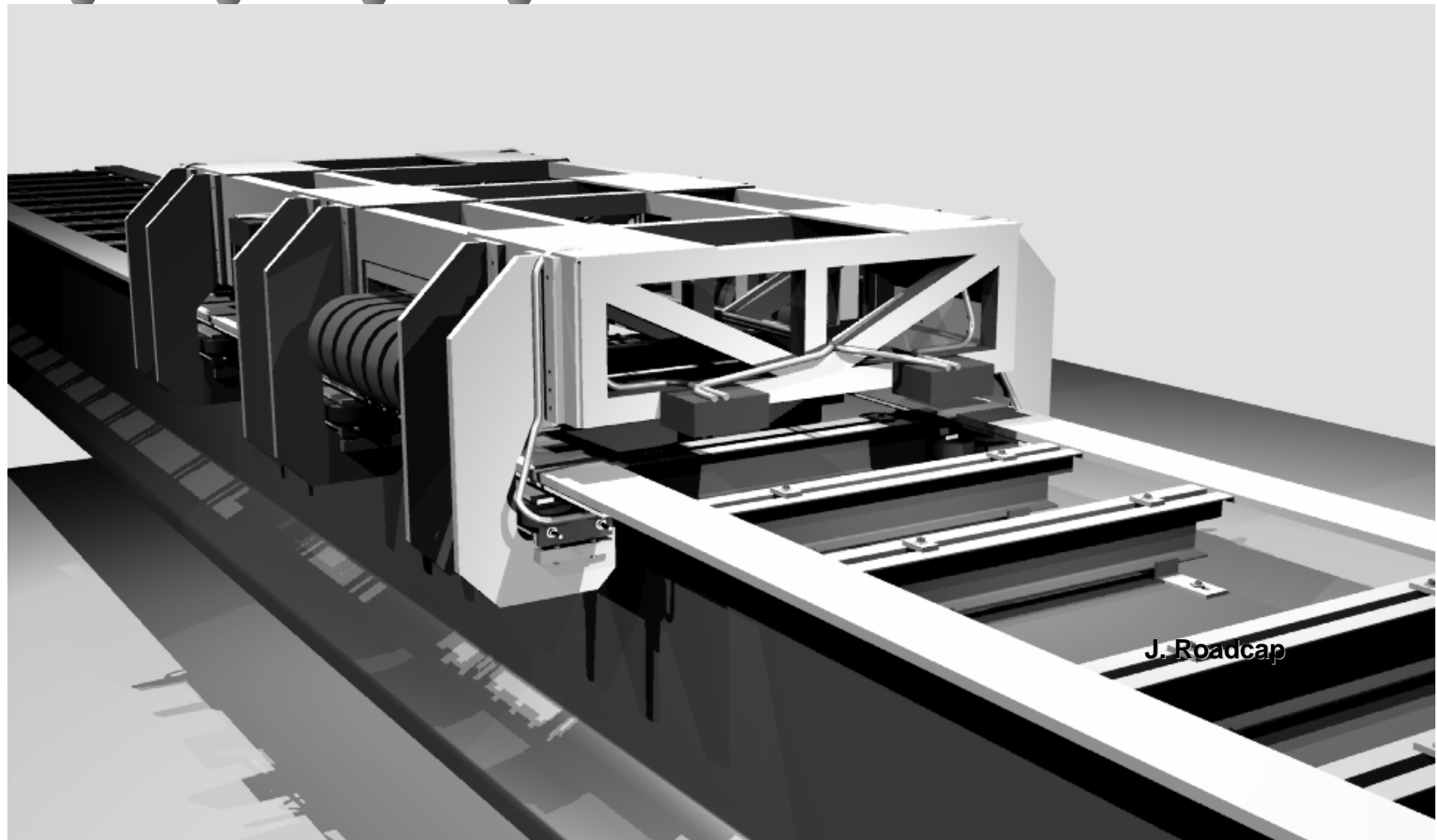


Bogie Progression: Lab Phase

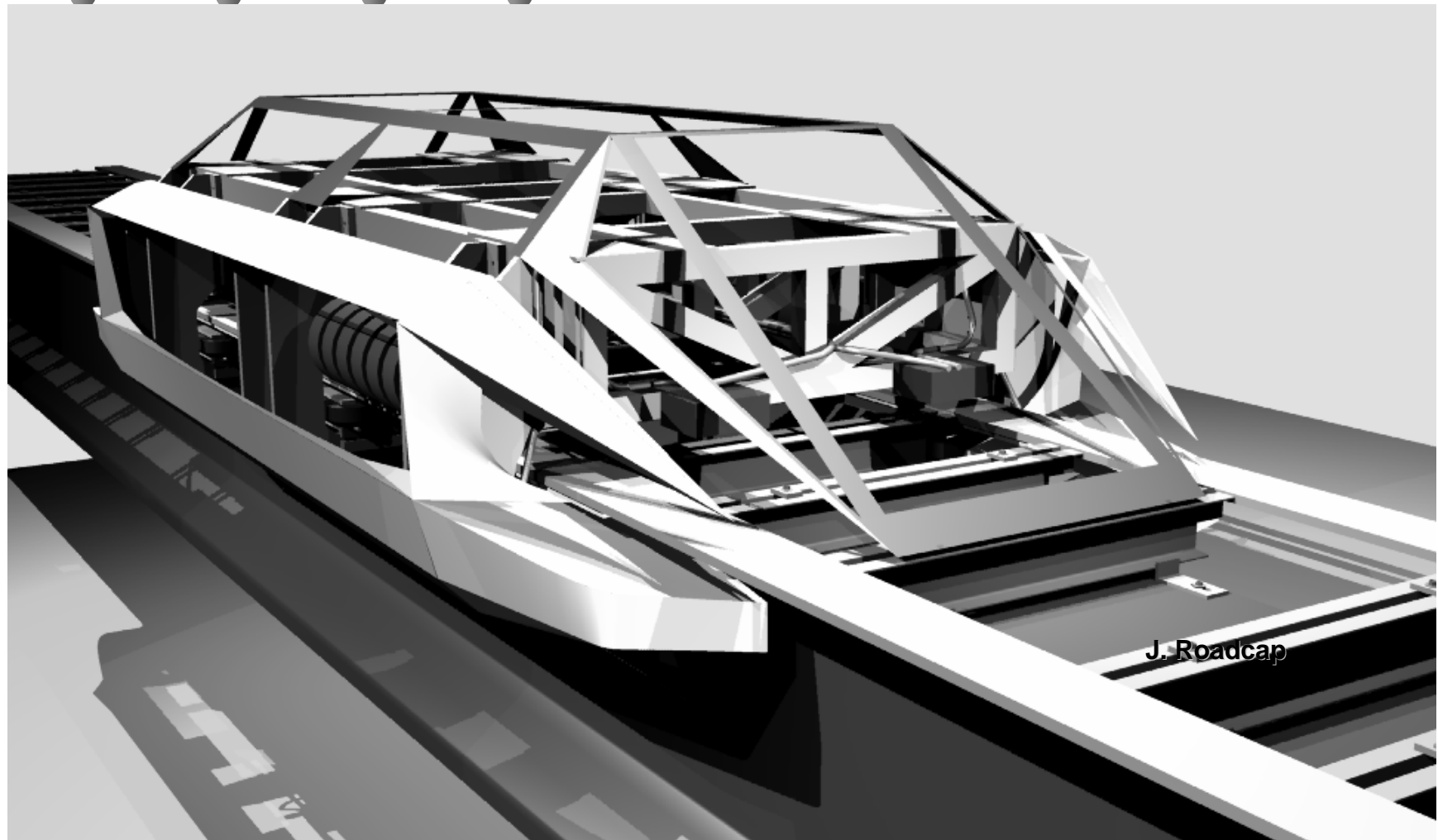


J. Roadcap

Bogie Progression: Guideway Phase



Bogie Progression: Aero Shell



Bogie Progression: Aero Shell

