



ODU Research: An Overview and Its Context

Mohammad Karim

VP Research

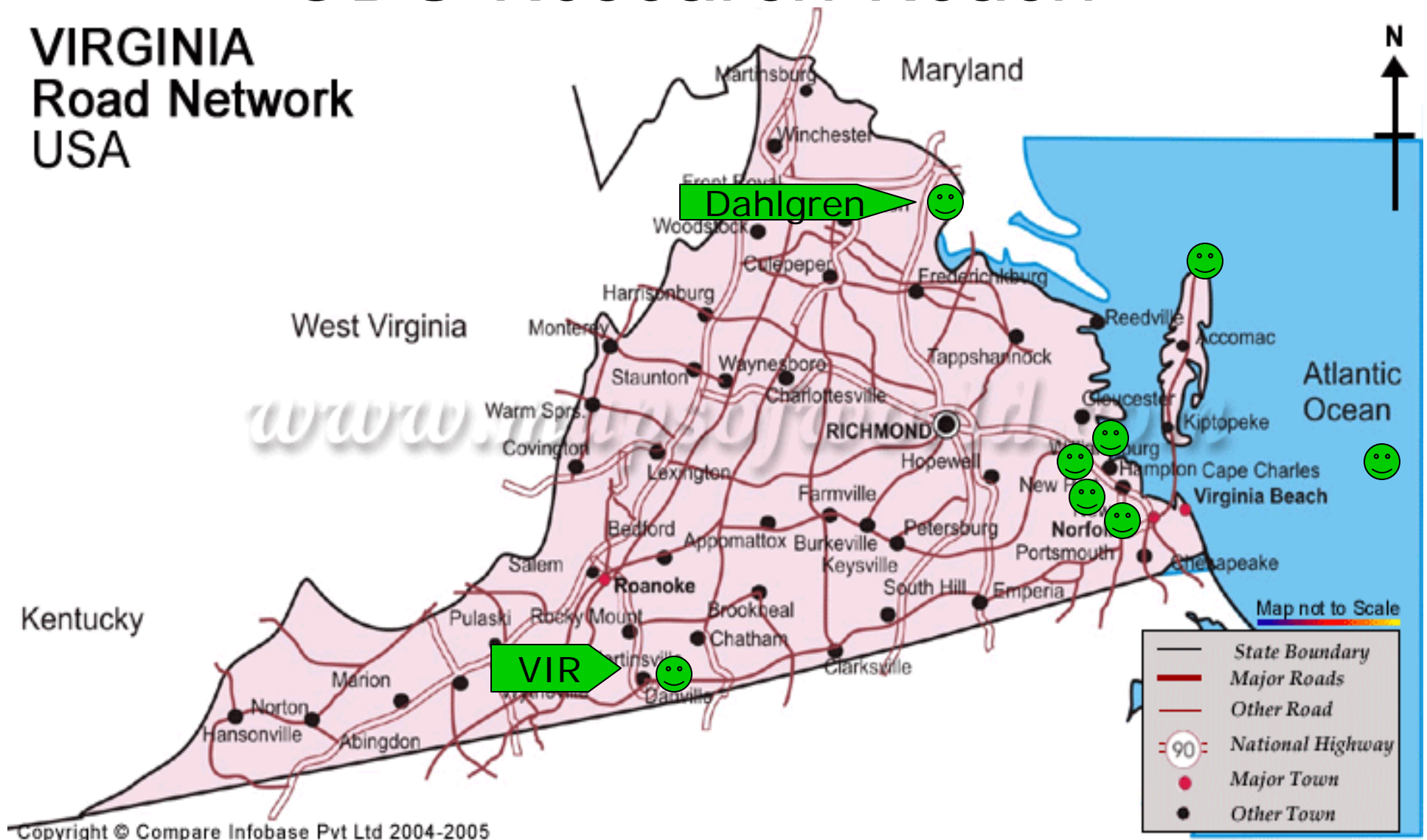
January 21, 2008

 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

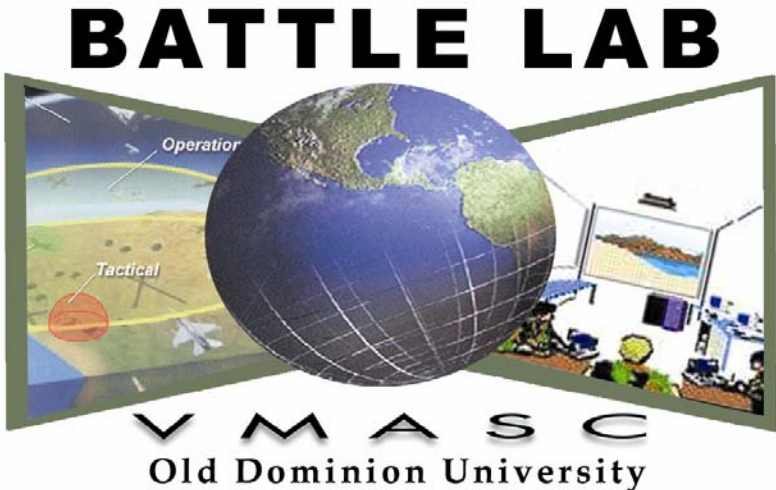
(Virginia Modeling Analysis & Simulation Center)

- 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>
---------------	-------------	-------------	-----------------

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

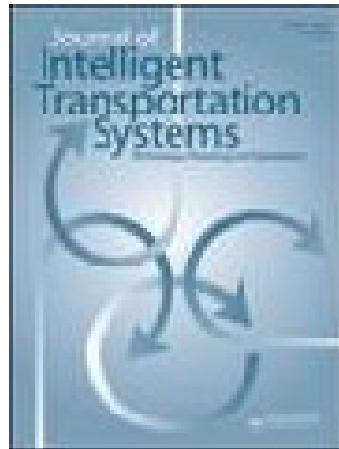
Total Output	\$258.4M	\$364.6M	+41.1%
Regional Product	\$167.3M	\$237.8M	+42.1%
Employment	3,524	4,420	+25.4%
Average Salary	\$60.2k	\$82.7k	

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

Sim City, USA



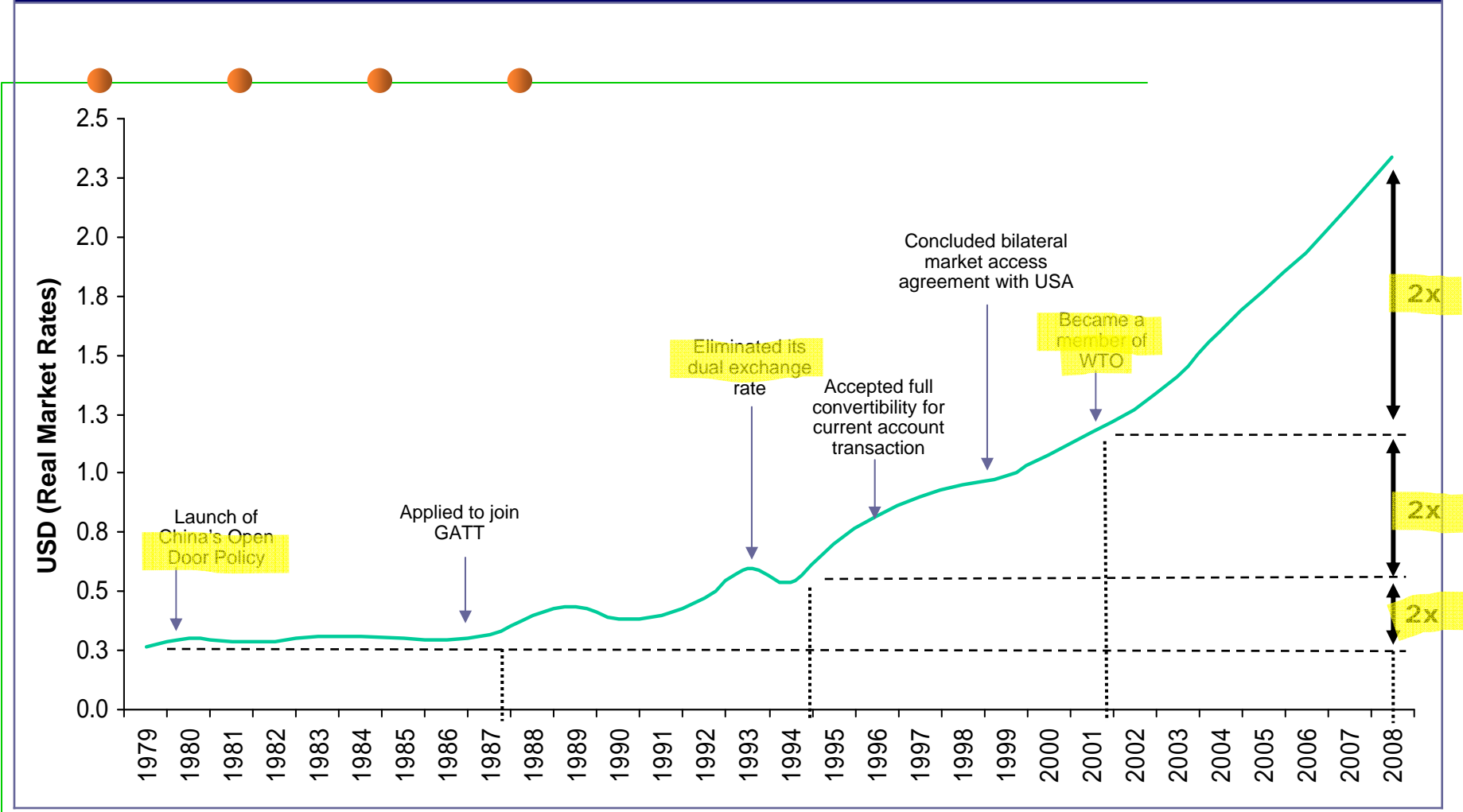
Multi-modal Transportation



- 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

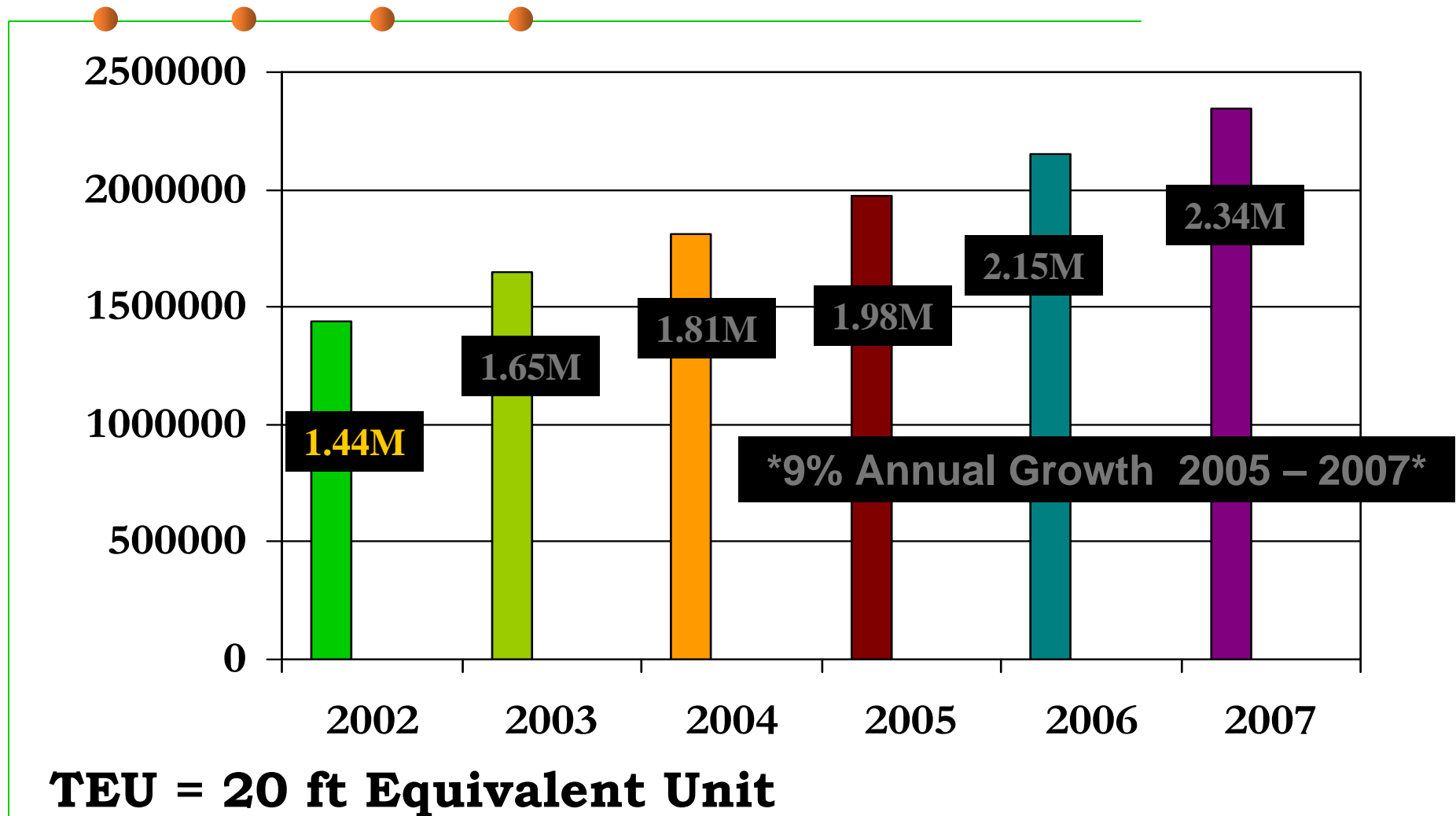
China GDP (USD trillion)



Source: IMF

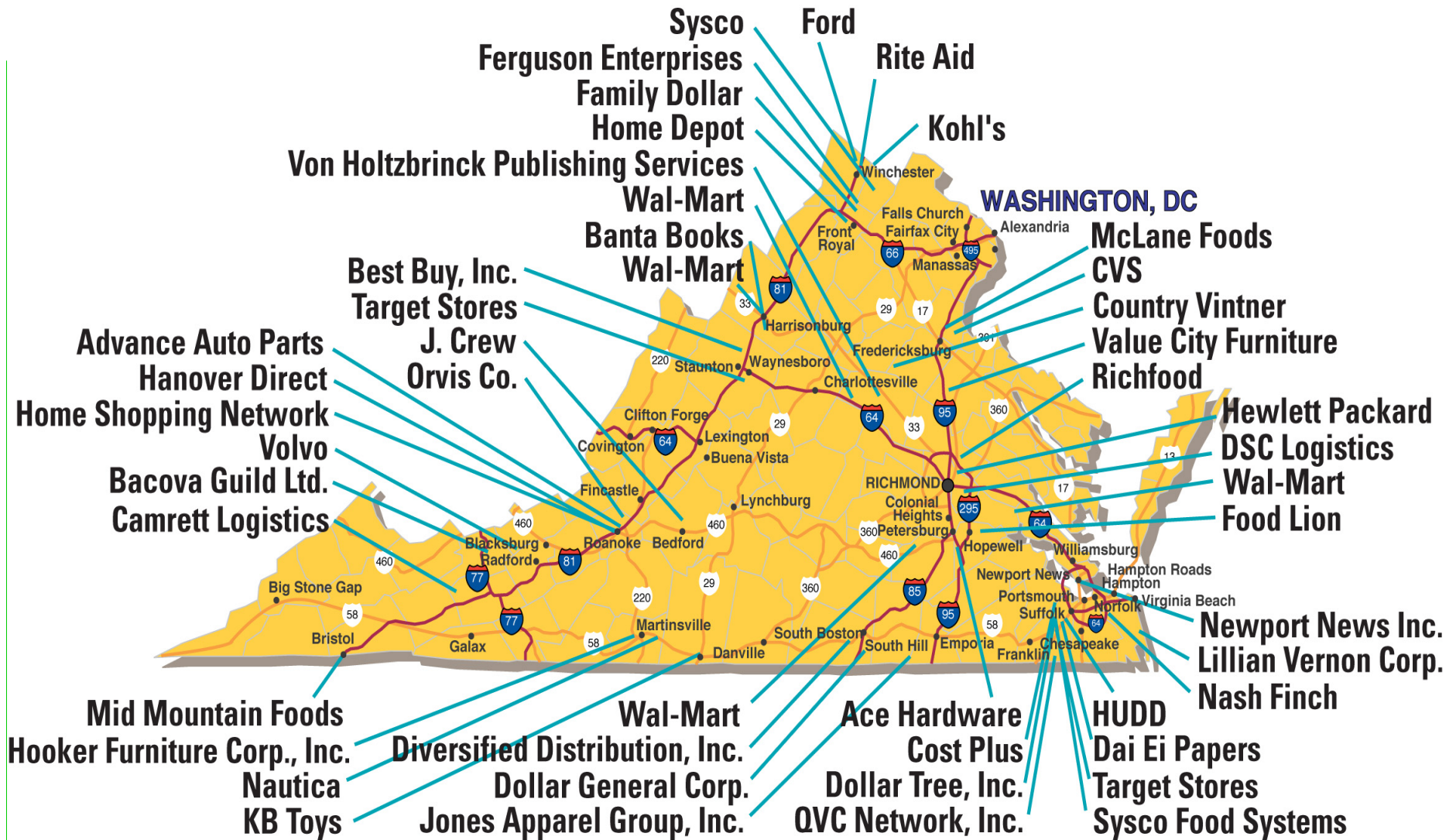


Port of VA: Performance/Forecast

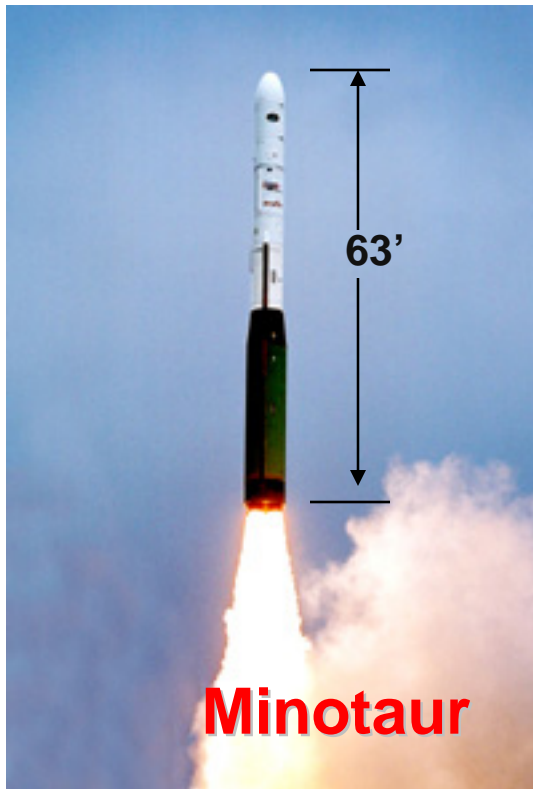


Distribution Centers

Over 80 Distribution Centers located in VA



Mid Atlantic Regional Spaceport (MARS)



Orbital

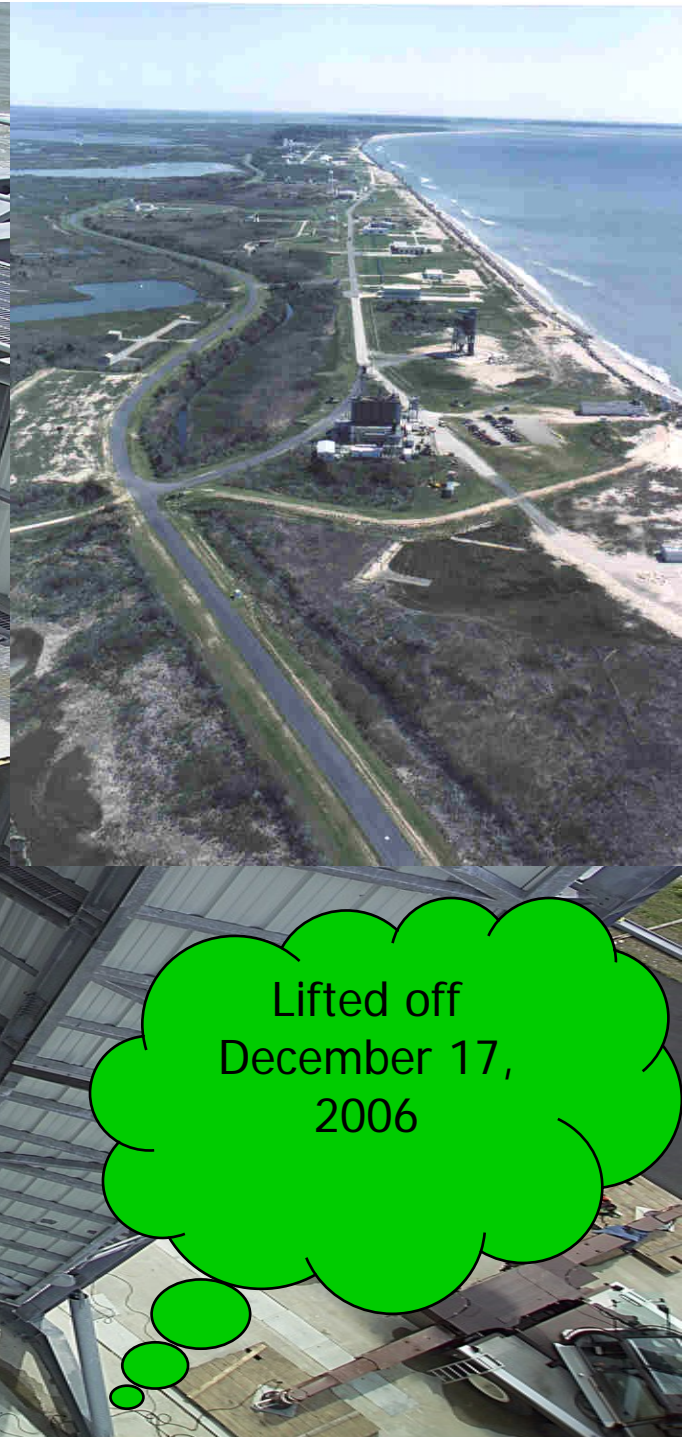
*USAF Launch contract for
Minotaur launch*

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

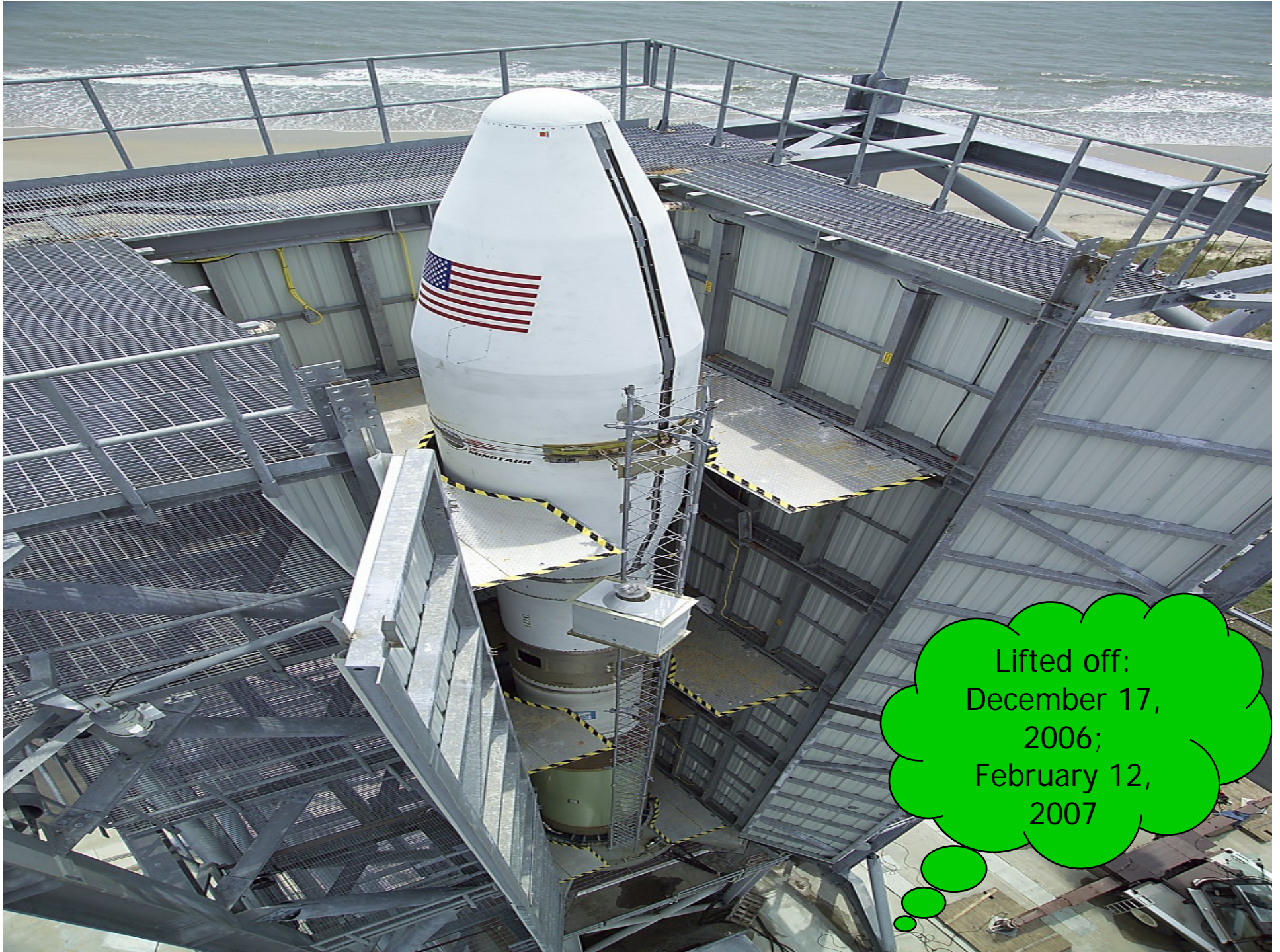


Mid Atlantic Regional Spaceport

Old Dominion UNIVERSITY

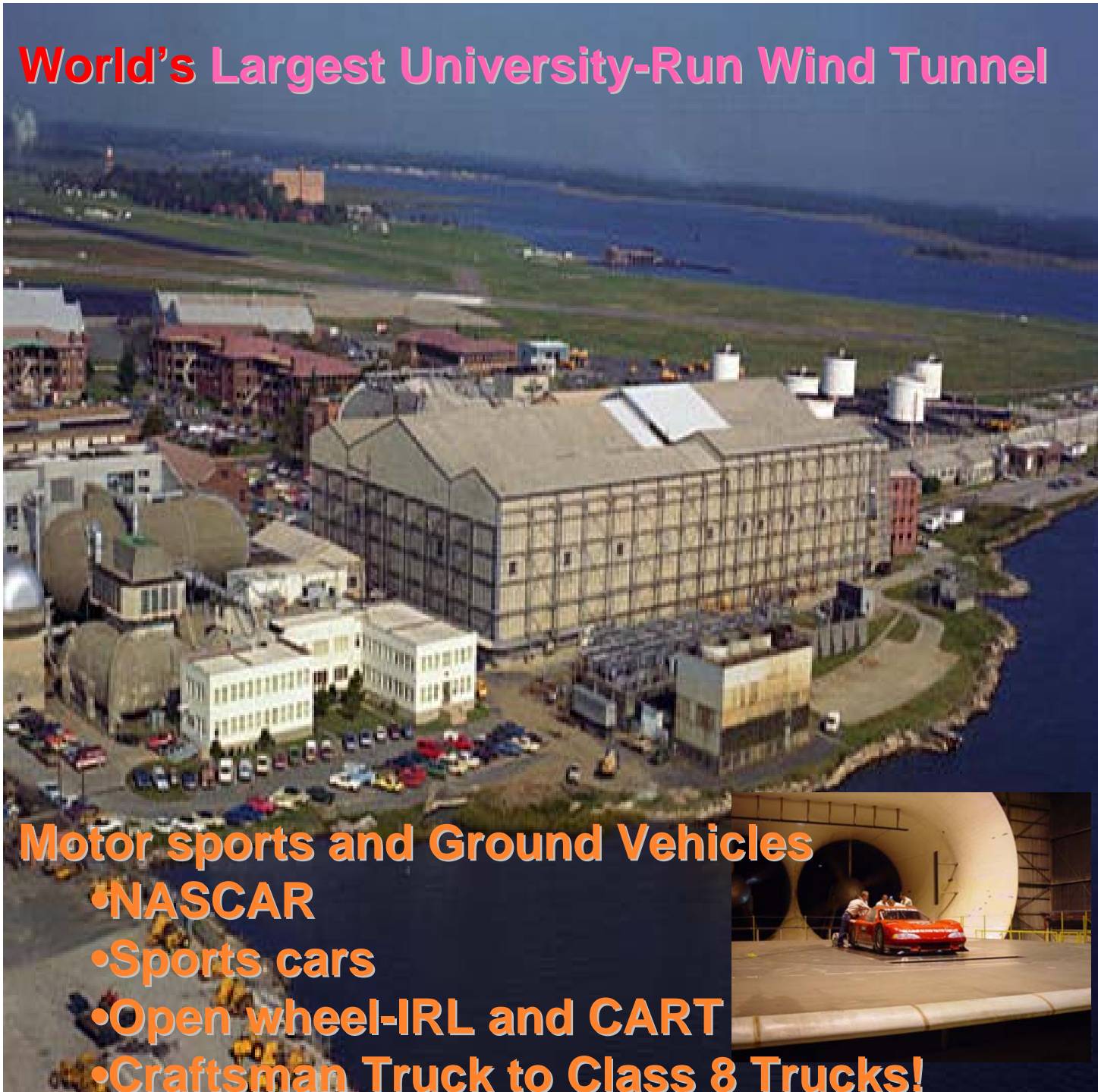


Lifted off
December 17,
2006



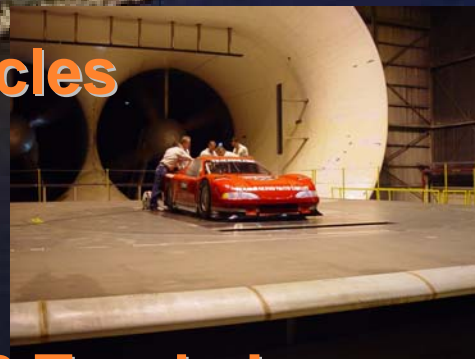
Lifted off:
December 17,
2006;
February 12,
2007

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!

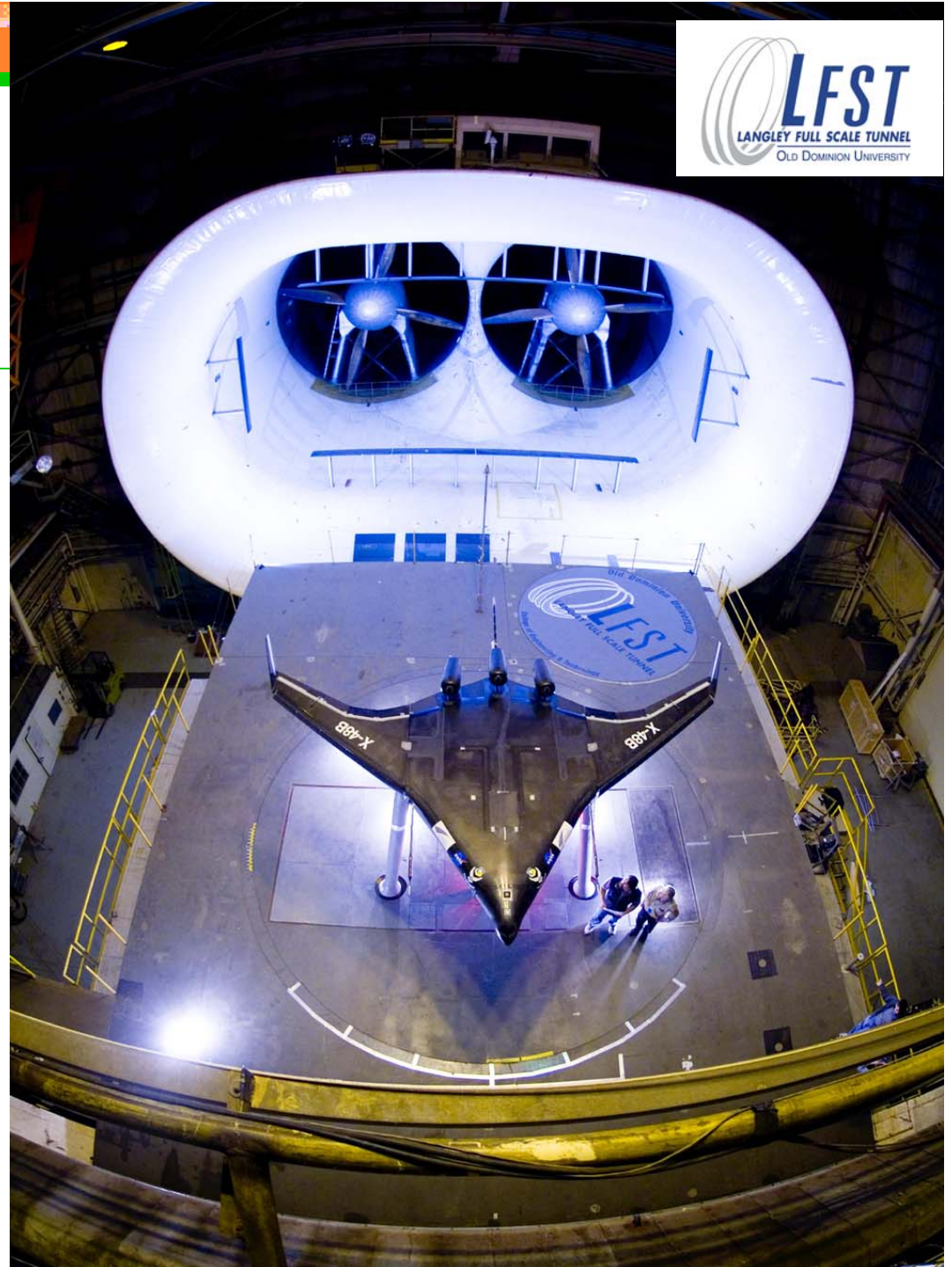


The Langley Full-Scale Tunnel (LFST)

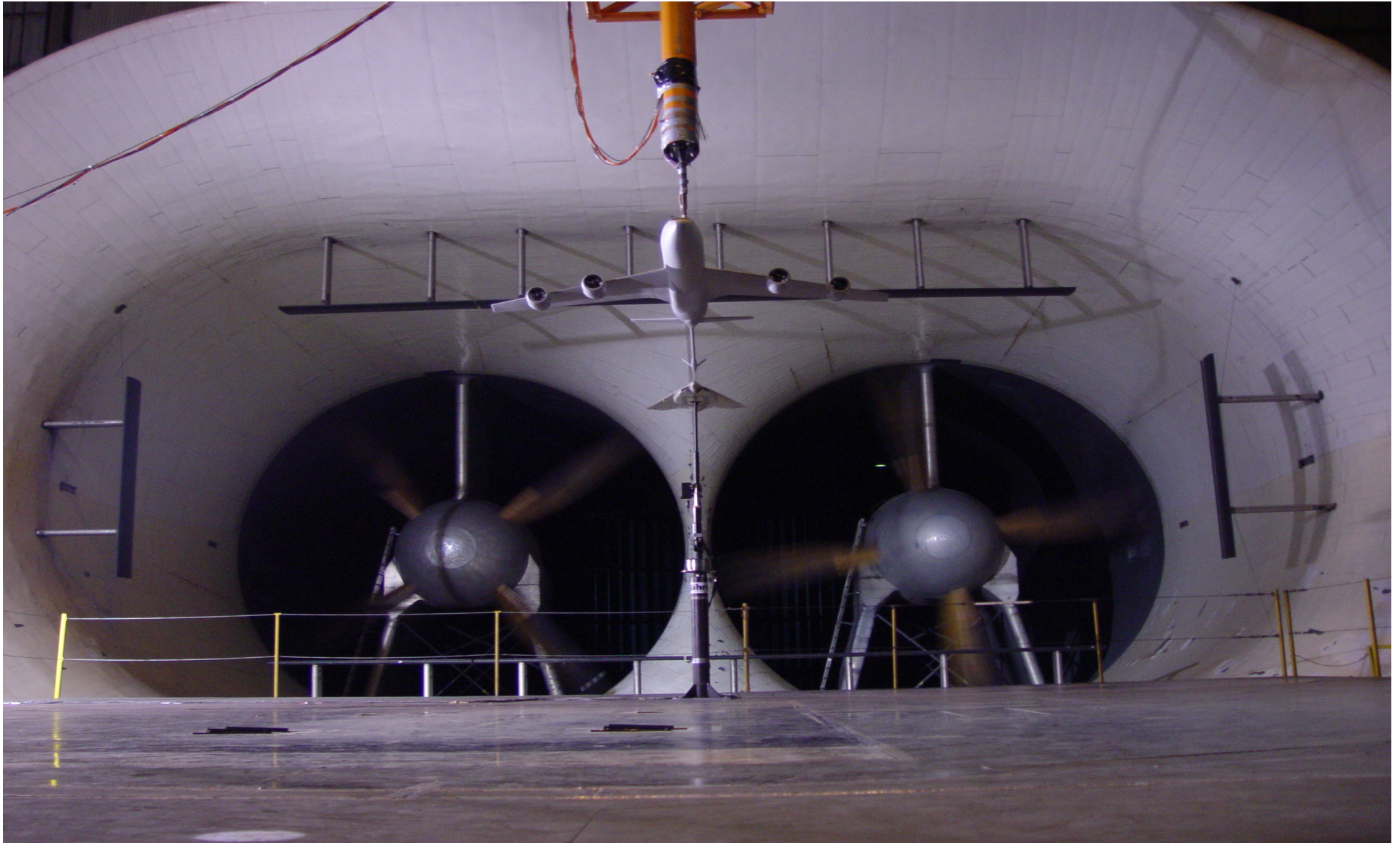
The largest University-operated wind tunnel in the world



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

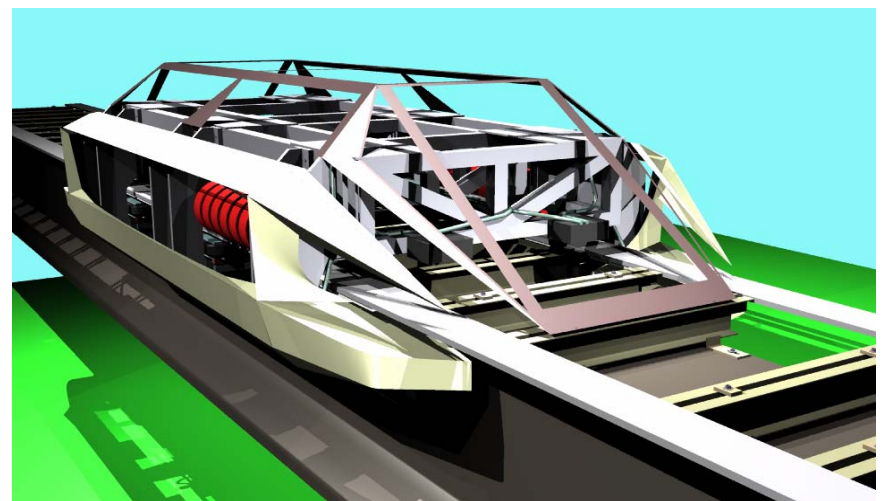


Aerodynamic Testing of Airborne Refueling of UAV by KC-135 Tanker



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

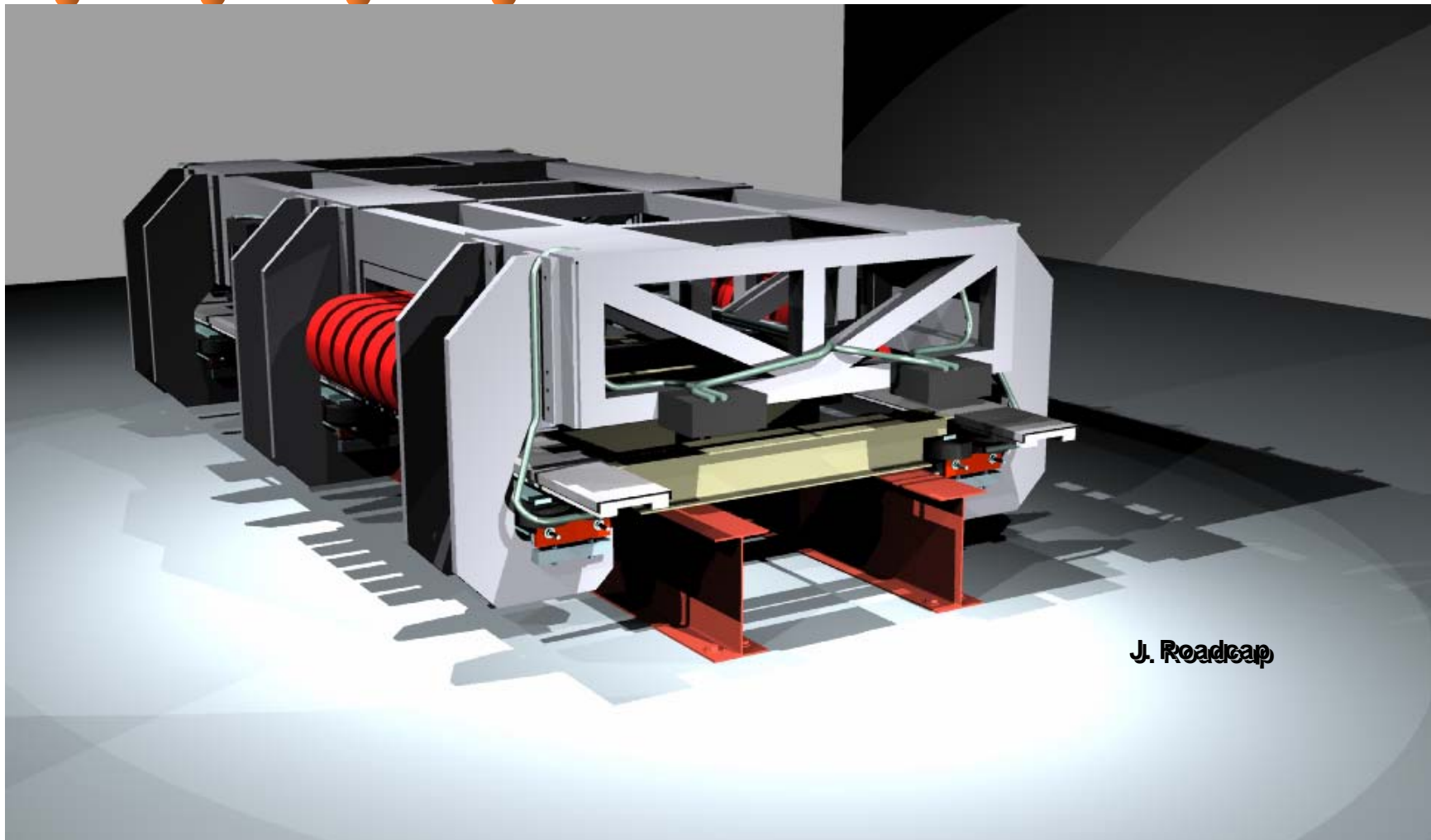
3400 ft.

Powhatan Avenue

Hampton Blvd.

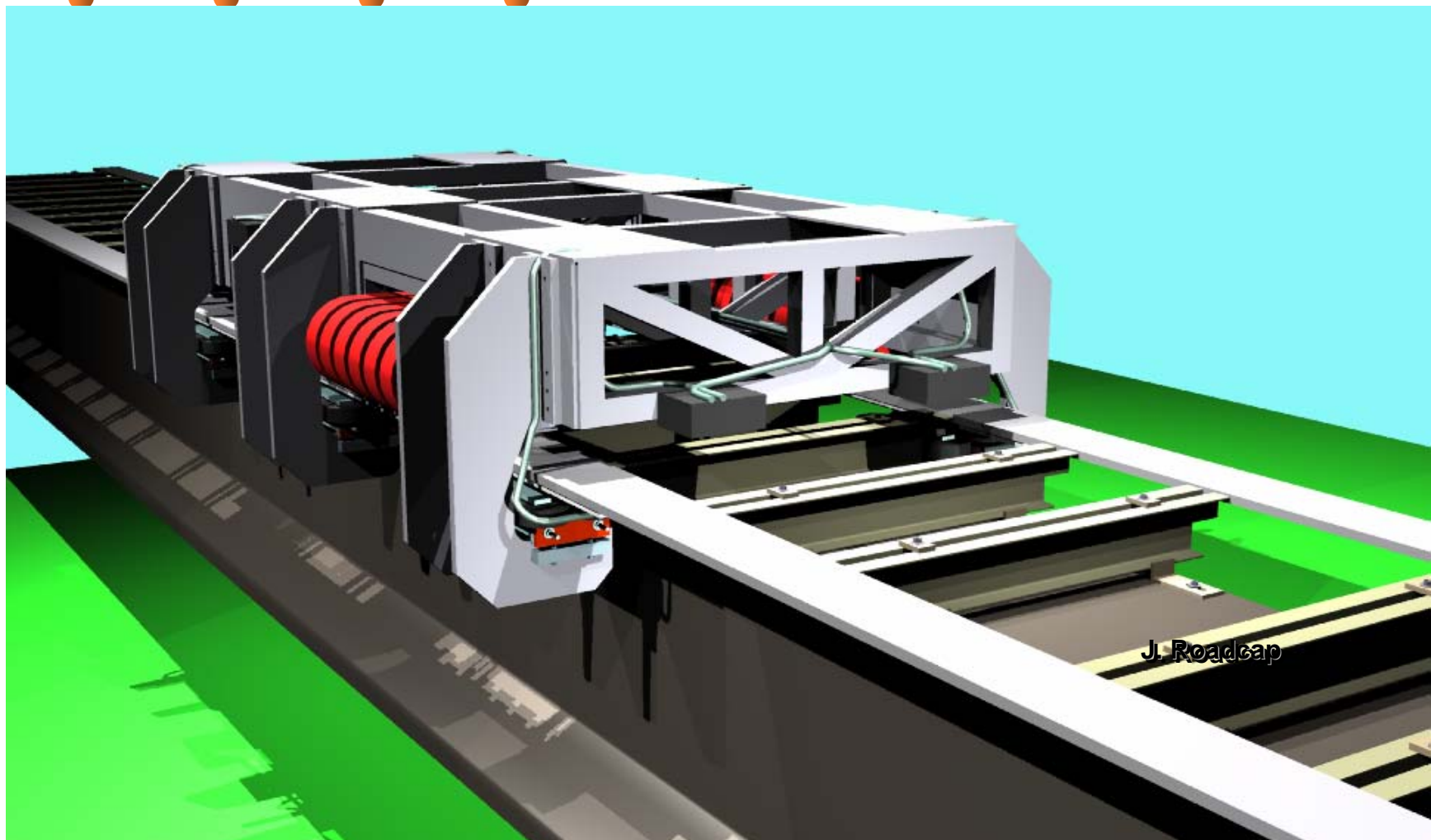


Bogie Progression: Lab Phase

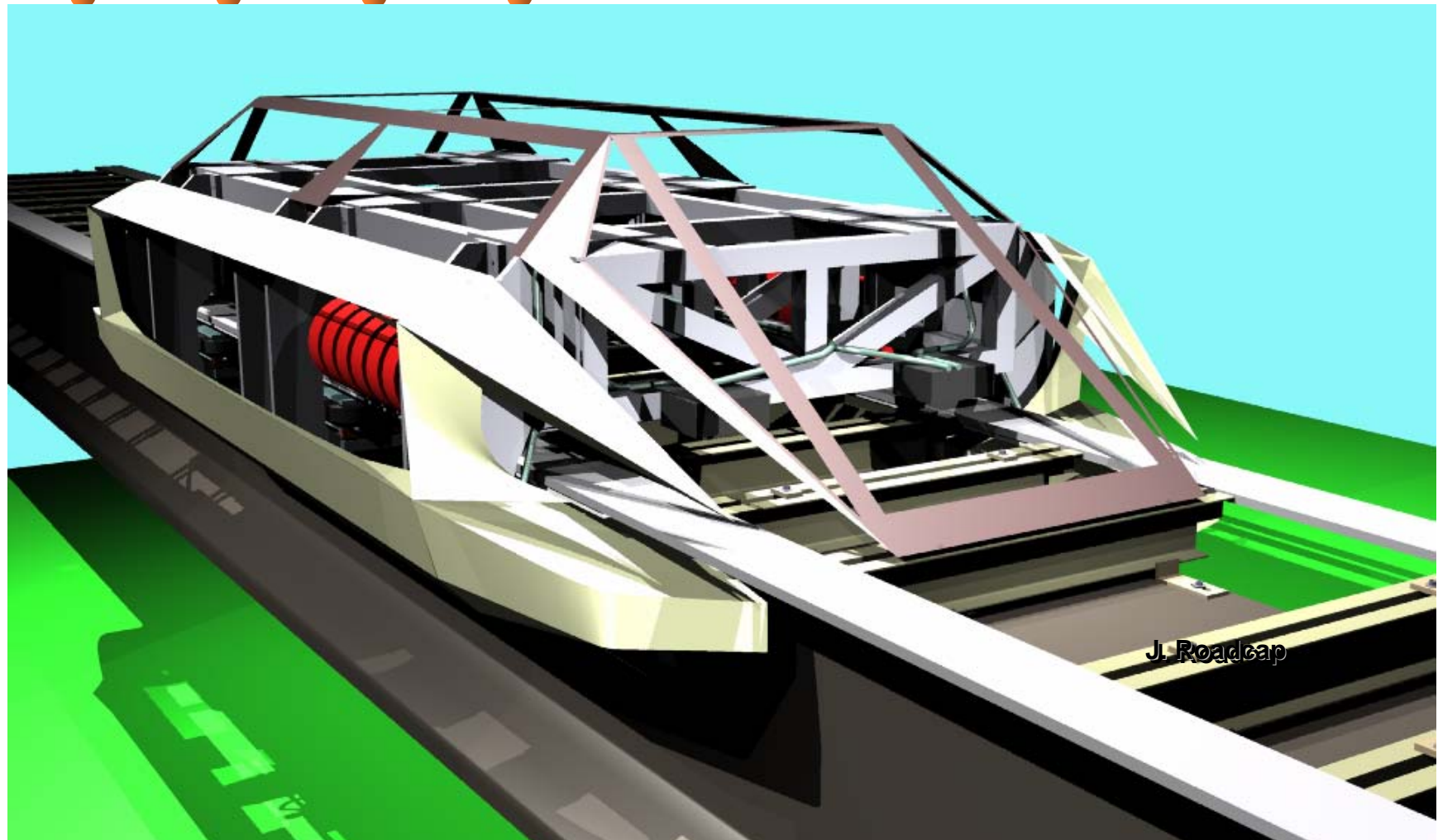


J. Roadcap

Bogie Progression: Guideway Phase



Bogie Progression: Aero Shell



Bogie Progression: Aero Shell

