



The Port of Virginia

Zero and Low Emissions Dray Truck Study

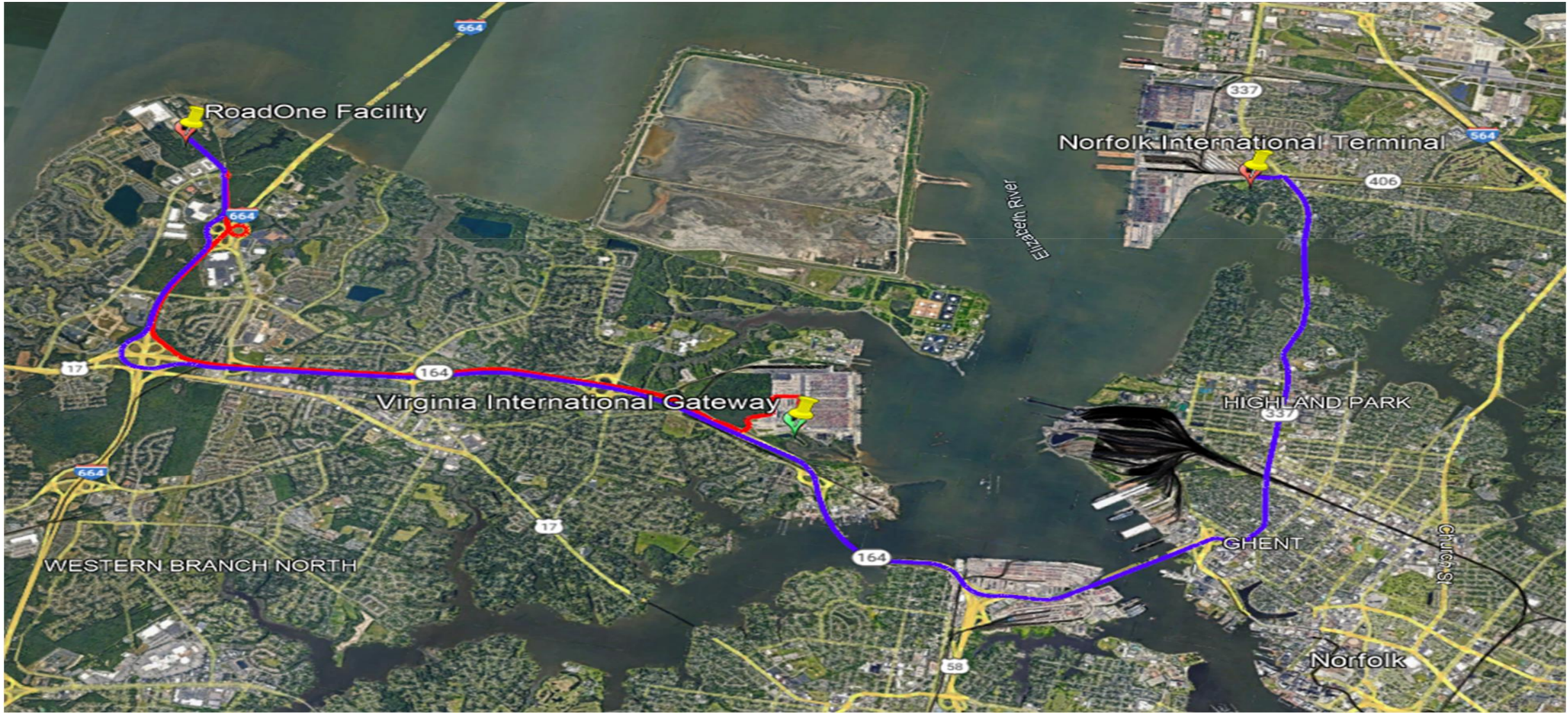
December 2022



Purpose: Evaluate the ability of a zero or near zero emission Class 8 truck to serve in a pilot with routes between a new Road One distribution facility and POV terminals.

Technologies Evaluated: Electric, RNG/CNG, and Hydrogen fuel cell

Study performed by Kimley-Horn assisted by Hana Engineers and Consultants





Electric Trucks:

Nikola and Volvo considered

RoadOne currently testing Nikola out of MD Ports

Volvo available in the near future and a VA business

Some results coming out of Nikola pilot, may lend better to serving POV facilities

Most ready technology for prime time – power supply and charging infrastructure a consideration

RNG/CNG:

RNG sourcing/delivery - available

Freightliner Cascadia considered

Available BUT from and environmental standpoint – the least beneficial at this time

Hydrogen Fuel Cell:

Hydrogen sourcing/delivery/production/creation – availability

Hyzon evaluated in study – fuel cell electric

Hyundai and Toyota pilots in LA and Oakland ports – waiting for results
currently deployed in Europe

Anheuser Busch to test Hydrogen Nicola in design



Challenges: Cost \$\$\$ + current availability
Heat and A/C usage – Road One and HRT examples
Gross vehicle weight question

Findings: Battery electric and RNG/CNG
currently in production and available in the marketplace
from an environmental standpoint CNG results in an approximate 20% GHG reduction
both are sufficient to operate for the pilot

Hydrogen
viability here estimated at 5-7 years
testing ongoing on west coast