

VOLVO

Pascal Amar
Principal Investigator

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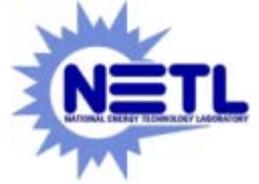
Keith Brantley

DEER 2011 Conference



SuperTruck

Project Overview



- **Duration:** 5 years
- **Project Cost:** \$38M (cost share: \$19M)
- **Objective#1:** Improve Freight Efficiency by 50%
 - Requires powertrain capable of 50% Brake Thermal Efficiency
- **Objective#2:** Demonstrate 55% Brake Thermal Efficiency Concept

Baseline = MY2009 'best in class' highway vehicle



SuperTruck

Partners & Collaborations



- Volvo Technology
- Volvo Group North America
- Freight Wing
- Grote
- Hendrickson
- Penn State University



VOLVO

FREIGHT WING

Grote

HENDRICKSON



Improving Freight Efficiency

Advanced Driver Aids

High Efficiency Combustion

- Waste Heat Recovery
- Turbo-Compound
- Downspeeding
- ...

Idle Reduction

**Parasitic Loss
Reduction**

**Advanced
Materials**

**Rolling Resistance
Reduction**

**Aero. Drag
Reduction**

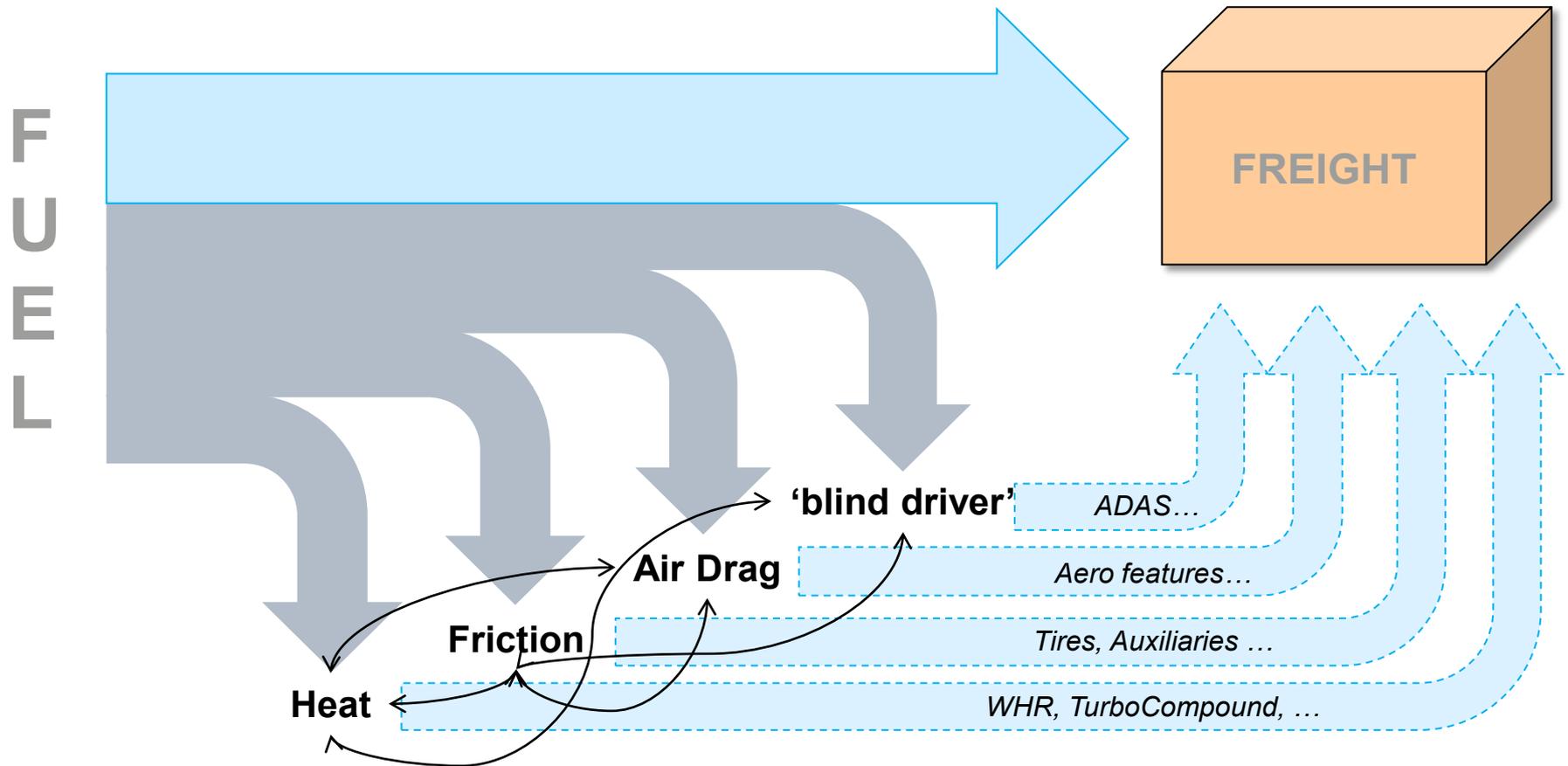


Agenda



- The SuperTruck Challenge
- A Complete Vehicle Approach
- Technology Roadmap Preview

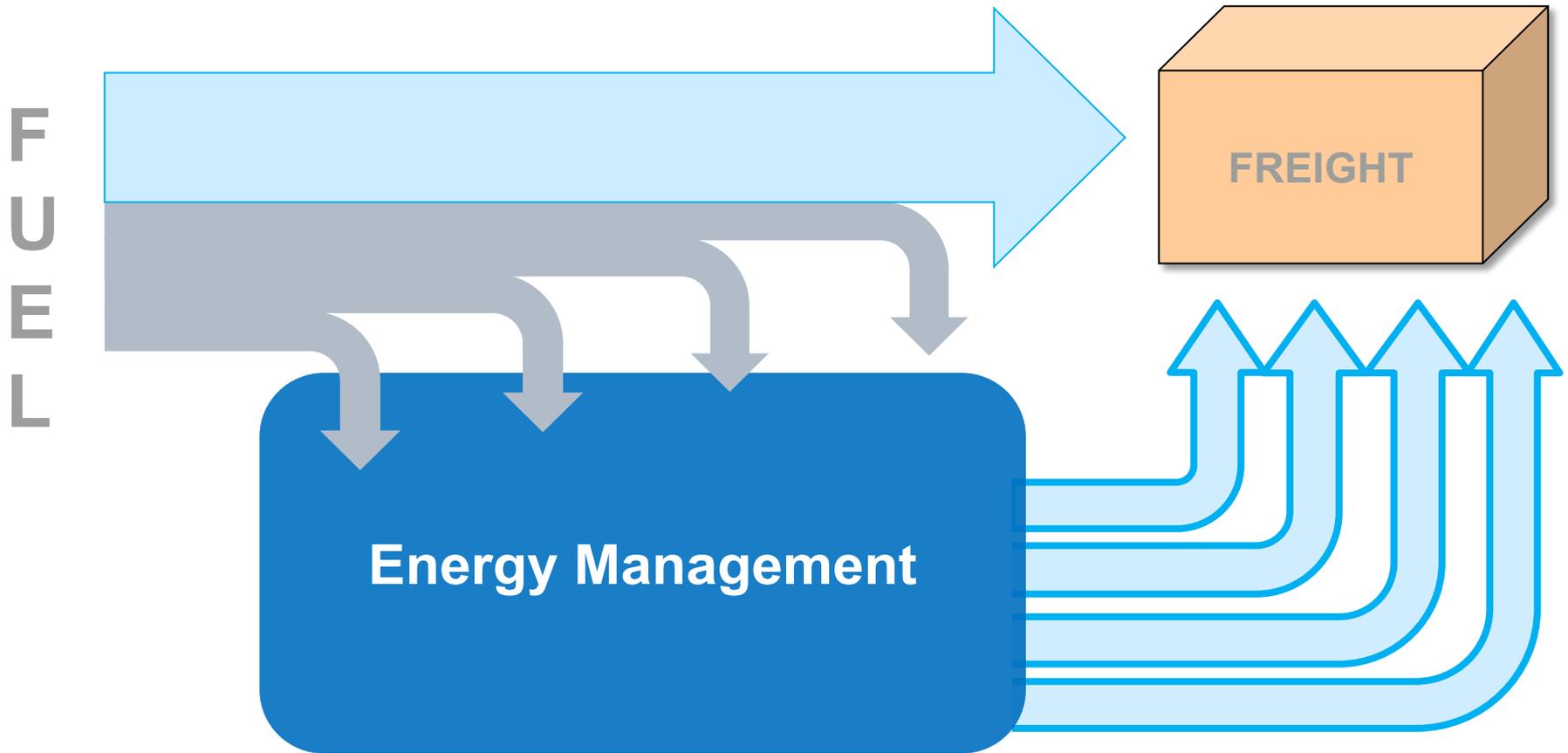
The SuperTruck Challenge



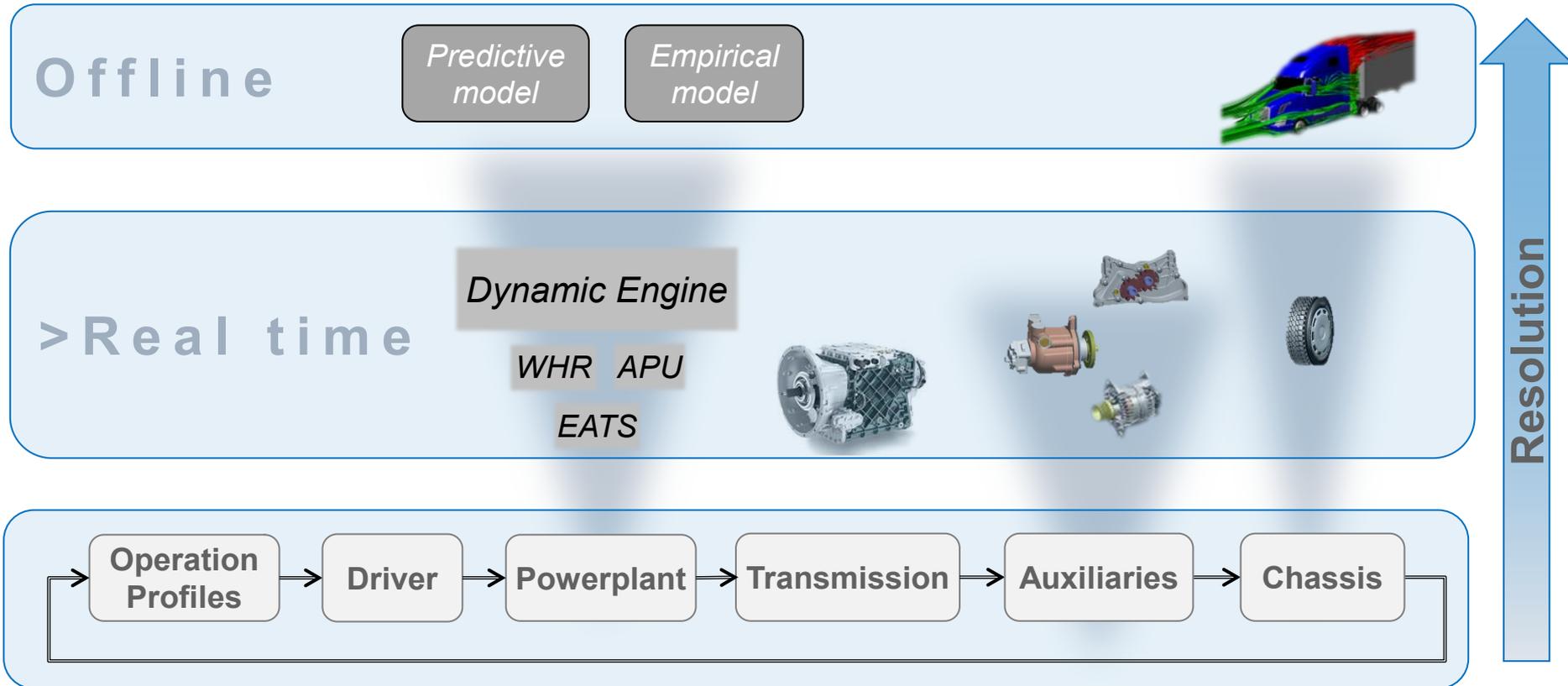


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Complete Vehicle Integration

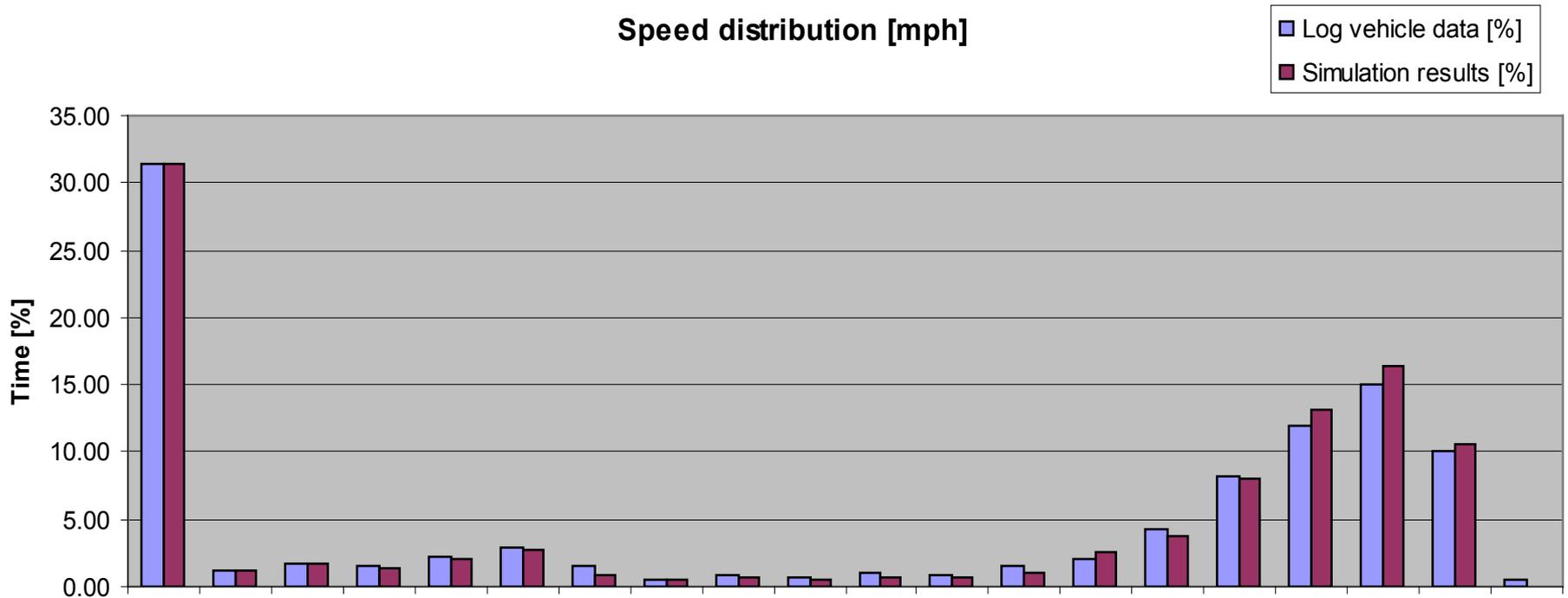


Global Simulation Platform

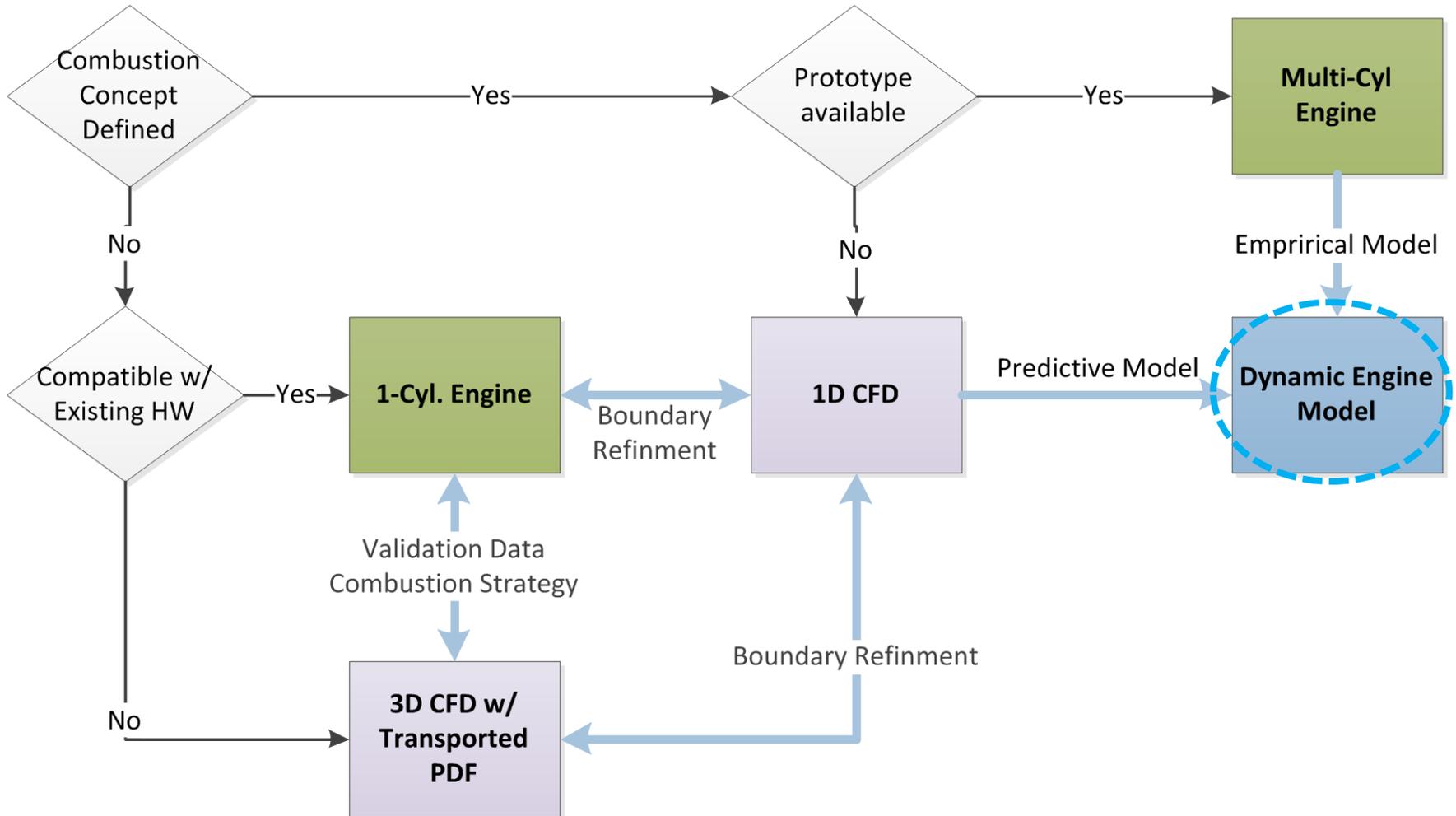


Simulating real-life conditions

- Virtual Duty cycles match >1,000,000,000 miles of data



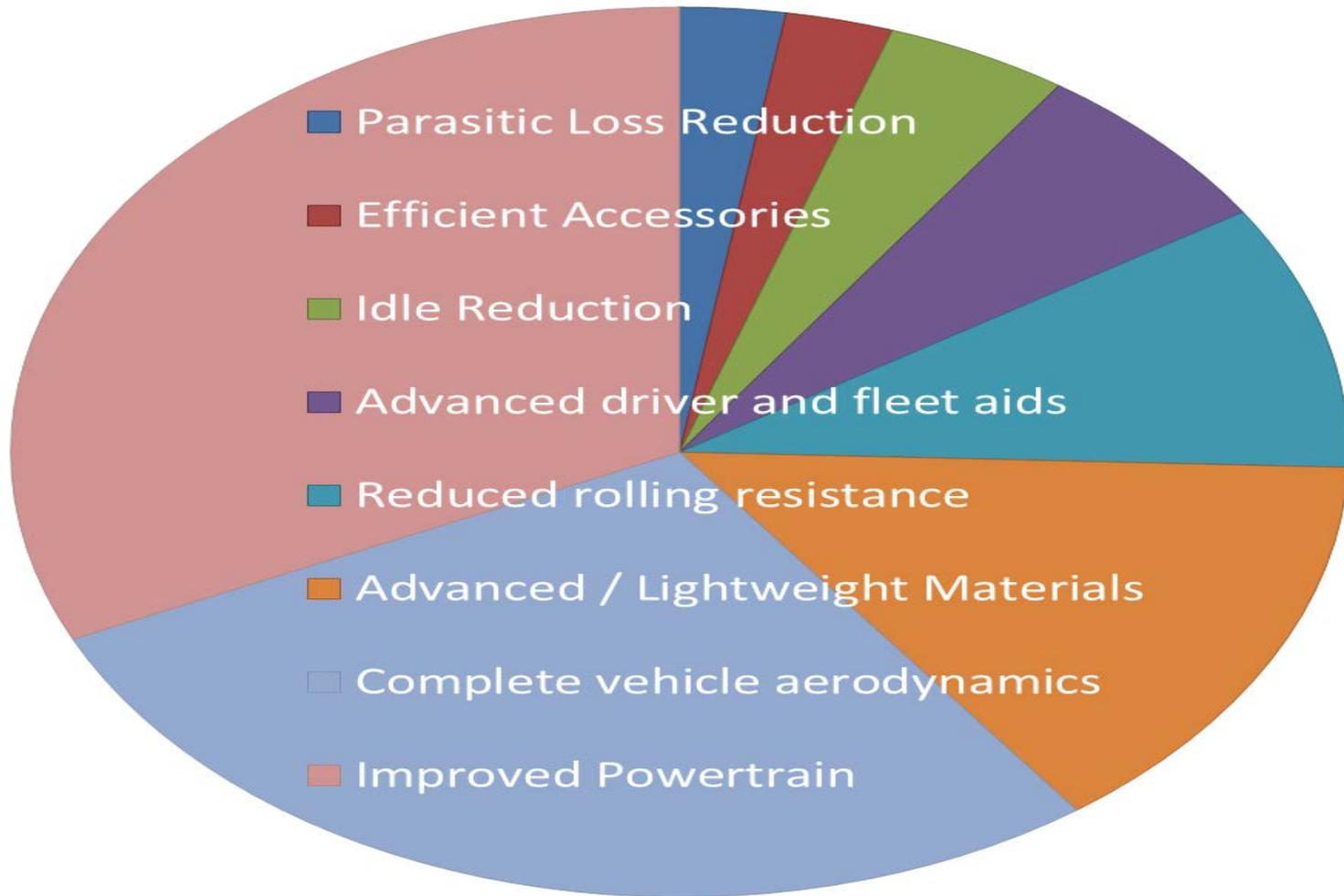
55% Thermal Efficiency Challenge



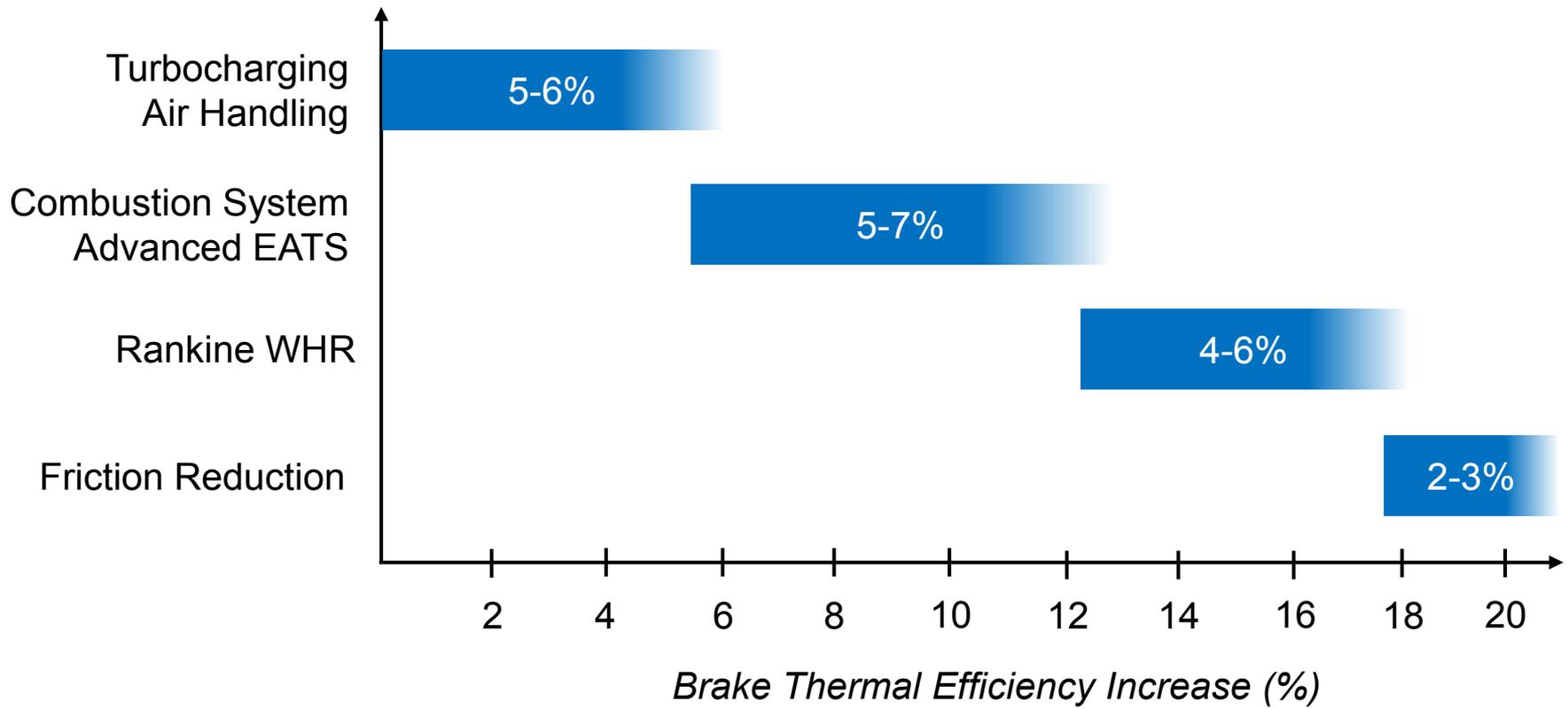


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Technology Portfolio

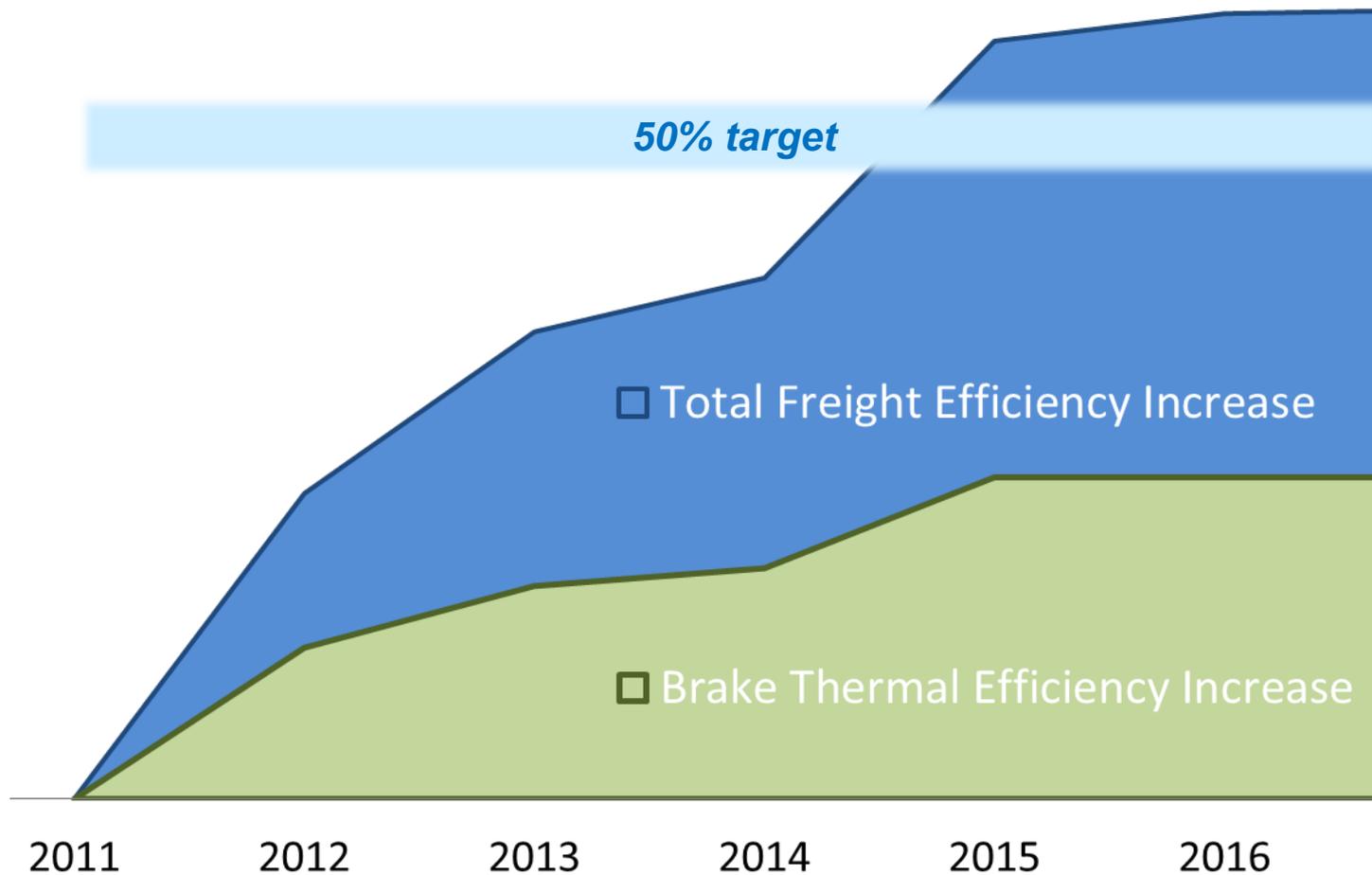


Increasing Thermal Efficiency



Preliminary Forecast

Freight Efficiency Improvements (ton-mile/gal)



Timeplan

2011	2012	2013	2014	2015	2016
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Baseline Tests

Virtual Development

Complete vehicle modelling **Validation** **Optimization**

Component/System Development

Complete Vehicle Integration

Concept Evaluation

Optimization

SuperTruck Demo

Conclusions

- SuperTruck requires a holistic approach
 - Complete vehicle integration
 - Vehicle simulation platform
- Simulation is key to finding pathway to 55% BTE

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