



Sustainable Supply Chain Advisory Committee

January Meeting Summary

- Date:** January 24th | 11 am – 3 pm
- Location:** In-person at Port of Long Beach and via phone conference
- Attendees:** Attachment A
- Meeting Agenda:** Attachment B

Overview:

The January 2018 Sustainable Supply Chain Advisory Committee (i.e. the Committee) meeting included participation from a new Committee member, discussed key themes for the Committee to tackle in 2018, and included a guest presentation from Volvo on advanced technology vehicle development & adoption.

Key Discussion Items *(Action items in green)*

1. **Admin: FMC Agreement #201219**
 - Gene Seroka introduced the FMC agreement and since the City Attorney’s office was not able to attend this meeting, this agenda item will be added to the March meeting agenda.
 - *GNA to file meeting summary with the FMC as required.*
2. **Introduce New Committee Member**
 - POLB staff introduced new committee member, Stella Ursua, who is a long time Long Beach resident and heads up strategic partnerships for GRID Alternatives, a solar installation company who prioritizes homes in Cap & Trade zones.
3. **Opening Remarks by POLA & POLB**
 - Mario Cordero discussed collaboration between all stakeholders to ensure operational and environmental issues are addressed in a way that allows the joint ports to stay competitive on a national scale. The San Pedro Bay Ports must work collaboratively to meet key customer deliverables and expectations around operational efficiency and resiliency.
 - Gene Seroka echoed Mario’s comments and added that seaports aren’t the only competition as air cargo has continued to gain market share. He also clean tech equipment funding will be key as the ports work to leverage the “market maker” concept for zero and near zero emission technology.



4. Summary of Past Recommendations

- GNA provided a brief overview of each recommendation that has been approved thus far by the Committee.

5. 2018 Goals and Focus Areas

- GNA provided an overview of the goals that were discussed at the December meeting.
 - See handout in **Attachment C**
- The Committee discussed adding innovative funding and financing for clean truck deployments as a focus area
 - The Committee agreed that state and local grants won't be enough to meet clean truck deployment goals
 - The Committee discussed a secondary market for trucks to increase the resale value would help
 - Infrastructure costs need to be a part of the discussion.
- The Committee discussed how to best prioritize the list for future meetings. A few options could include near-term projects, emission reduction capability, and cost-effectiveness.
 - **Action item: GNA to work with Port staff to develop a prioritized 2018 focus areas list for review at the March meeting.**

6. Review 2018 Meeting Schedule

- GNA provided an overview of the forward looking schedule.
- A recommendation was made to add an item at the beginning of each Committee meeting to review what is in the CAAP that pertains to the meeting topic.
 - **Action item: GNA to circulate a final 2018 meeting schedule**

7. Volvo Presentation on Advanced Technology Vehicle Development & Adoption

- Volvo brought in 13 people for their presentation. Guests in attachment
- Volvo's presentation can be found in **Attachment D**

8. Review summary of December meeting

- Summary was approved.
 - **Action item: GNA to post the final summary online**



Attachment A

Meeting Attendees

SSCAC Committee Members	
Adrian Martinez	Earth Justice
Stella Ursua	GRID Alternatives
Peter Peyton	Former ILWU
Elizabeth Warren	FuturePorts
Cynthia Marvin	CARB
Naveen Berry	SCAQMD
Thomas Jelenic	PMSA
Joe Lyou	CCA and SCAQMD Governing Board
Louis Dominguez	San Pedro Neighborhood Council
Los Angeles Port & City Staff	
Gene Seroka	Port of Los Angeles
Mike DiBernardo	Port of Los Angeles
Chris Cannon	Port of Los Angeles
David Libatique	Port of Los Angeles
Lisa Wunder	Port of Los Angeles
Tim DeMoss	Port of Los Angeles
Michael Samulon	City of LA, Mayors Office
David Reich	City of LA, Mayors Office
Jacob Haik	City of LA, Councilman Buscaino's Office
Long Beach Port & City Staff	
Mario Cordero	Port of Long Beach
Rick Cameron	Port of Long Beach
Heather Tomley	Port of Long Beach
Mark Taylor	City of Long Beach, Mayor's Office
Meeting Facilitation Staff	
Erik Neandross	GNA
Lexi Wiley	GNA
Patrick Couch	GNA
Jon Leonard	GNA
Others/Guests	
Jessica Alvarenga	PMSA



Cody Rosenfield	CCA
Dawn Fenton	Volvo
Pascal Amar	Volvo
Sam McLaughlin	Volvo
Aravind Kailas	Volvo
Jeffrey Denny	Volvo
Dustin Coffey	Volvo
Scott Cramer	Volvo
Bob Massman	Volvo
Jessica Sandstrom	Volvo
David Hellstedt	Volvo
Bill Day	DHE
Edward Jobson	Volvo
Tom Fulks	MightyComm



Attachment B

Meeting Agenda

1. Admin: FMC Agreement #201219
2. Introduce New Committee Member
3. Mario Cordero & Gene Seroka Remarks
4. Summary of Past Recommendations
5. 2018 Goals & Focus Areas
6. Review 2018 Schedule
7. Volvo Presentation on Advanced Technology Vehicle Development & Adoption
8. December Meeting Summary
9. Conclusion & Discussion of Next Steps



Attachment C

Handout:

Summary of Goals and Priorities for 2018

During the December 2017 meeting, the Committee discussed several goals and priorities for the group to consider for future recommendations in 2018. A summary of the key points are as follows:

1. Develop a One-Page Guiding Document (Tailpipe & “System of Systems”)
2. More Engagement with Labor re: Participation in NZE and ZE Technology Future
3. Port and Goods Movement Focused Funding Advocacy by the Committee
4. Accelerate Technology & Efficiency Innovation, Development and Commercial Deployment
 - On-Road Truck
 - Container Handling Equipment (CHE)
 - Marine
 - Locomotive/Rail

Recommended Next Steps:

- GNA to review SFAC Year 1 Summary Report (includes SFAC recommendations on next steps) and integrate into this draft priority & goals document.
- GNA to facilitate calls with committee members on the above list.
- GNA to organize a meeting with POLA & POLB to review draft list, and to received feedback from the Ports so there is alignment with key Port goals & priorities
- Present updated draft at next SSCAC meeting (March)

The Road to Advanced Technology Vehicle Commercialization



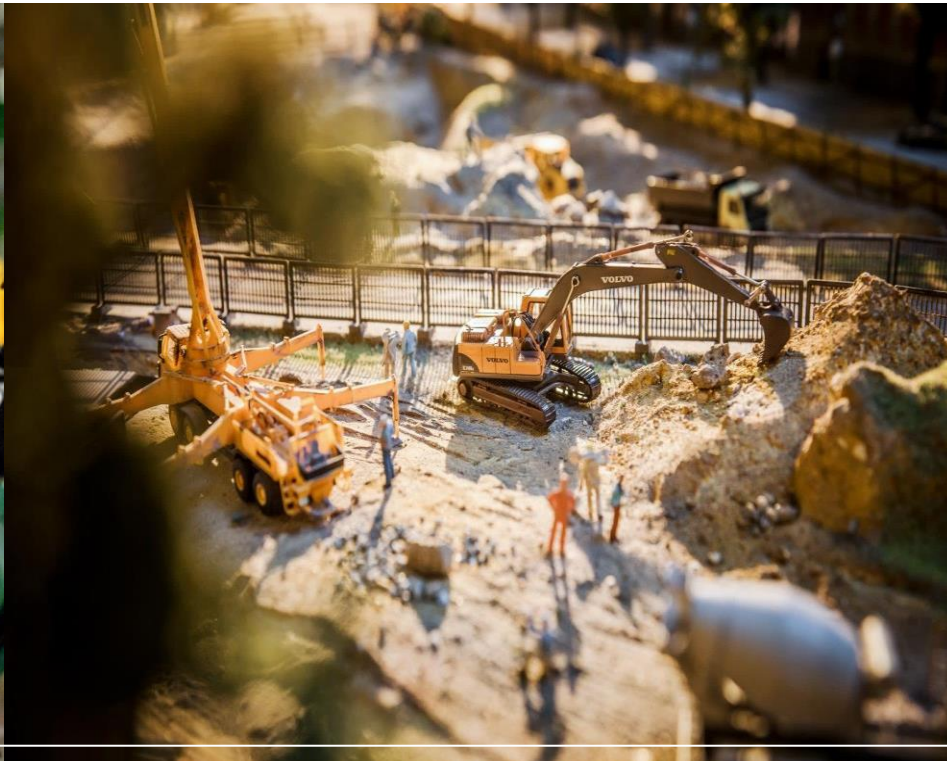
Agenda

Introduction and Review of Agenda	(5 minutes)
Horizon of Advanced Technology Solutions <i>An overview of technologies that will revolutionize the heavy-duty vehicle industry in the next decade</i>	(15 minutes)
Technology Development Process Technology readiness / integration / demonstration Industrialization & aftermarket Policy & infrastructure readiness for successful adoption	(45 minutes)
Fleet adoption of Advanced Technology Vehicles <i>Hear from fleet and dealer representatives about the factors influencing purchase decisions for advanced technology vehicles.</i>	(30 minutes)
Q&A	(20 minutes)
Wrap-Up and Conclusions	(5 minutes)

Horizon of Advanced Technology Solutions

VOLVO

Volvo Group



Volvo Group presentation

Driving prosperity through transport solutions

OUR MISSION

Driving prosperity through transport solutions

Modern logistics is a prerequisite for our economic welfare: transport helps combat poverty. Transport is not an end in itself, but rather a means allowing people to access what they need, economically and socially.



Volvo Group 2018

We are one of the world's leading manufacturers of trucks, buses, construction equipment and marine and industrial engines.

We also provides complete solutions for financing and service.

We employ about **95,000 people**, have production facilities in **18 countries** and sell our products in more than **190 markets**.



On the road

In the city



**WHAT
WE
DO**



Off road

At sea

VOLVO

Volvo Group



WHAT WILL THE FUTURE HOLD?

Technology is driving change



**CONNECTED VEHICLE,
DRIVER AND GOODS**



PATH TO AUTOMATION



ELECTRIFICATION

SOFTWARE

KEY PRIORITIES

OUR PRIORITIES:

ELECTRIFICATION

VEHICLE AUTOMATION &

SAFETY

DIGITALIZATION

Substantial customer value provided with electrified trucks



Energy savings and reduced CO₂



Lower noise transport



Drivability increasing with electric driveline



Brand image

KEY PRIORITIES

OUR PRIORITIES:

ELECTRIFICATION

VEHICLE AUTOMATION &

SAFETY

DIGITALIZATION

Opens new possibilities for moving goods and people



KEY PRIORITIES

OUR PRIORITIES:

ELECTRIFICATION

VEHICLE AUTOMATION &

SAFETY

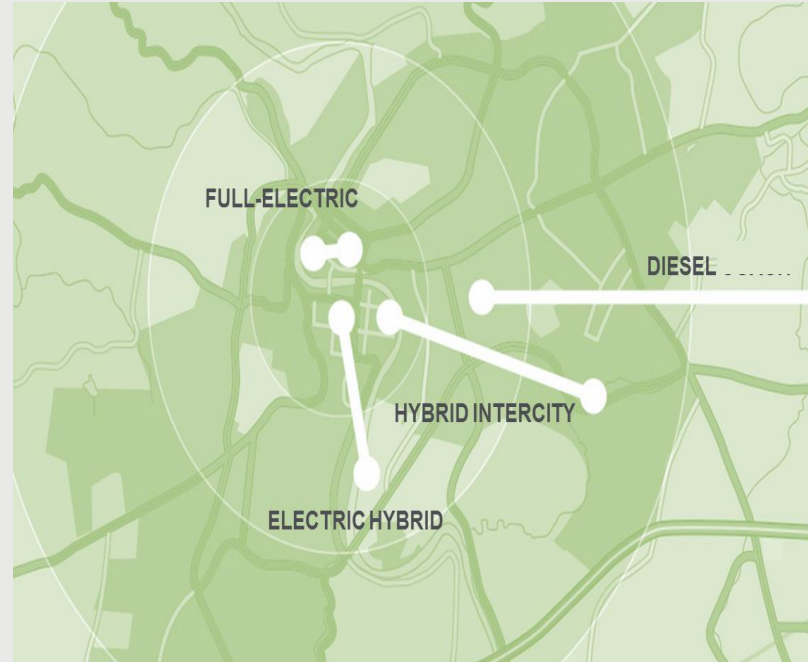
DIGITALIZATION

Key enablers to scale up electromobility

Availability of charging infrastructure –
standardization is essential

Batteries – Price Durability Energy density

Choosing the right application to start



KEY PRIORITIES

OUR PRIORITIES:

ELECTRIFICATION

VEHICLE AUTOMATION &

SAFETY

DIGITALIZATION



KEY PRIORITIES

OUR PRIORITIES:

ELECTRIFICATION

VEHICLE AUTOMATION &

SAFETY

DIGITALIZATION

Different solutions in different areas



CONFINED AREAS



PUBLIC ROADS

KEY PRIORITIES

OUR PRIORITIES:

ELECTRIFICATION

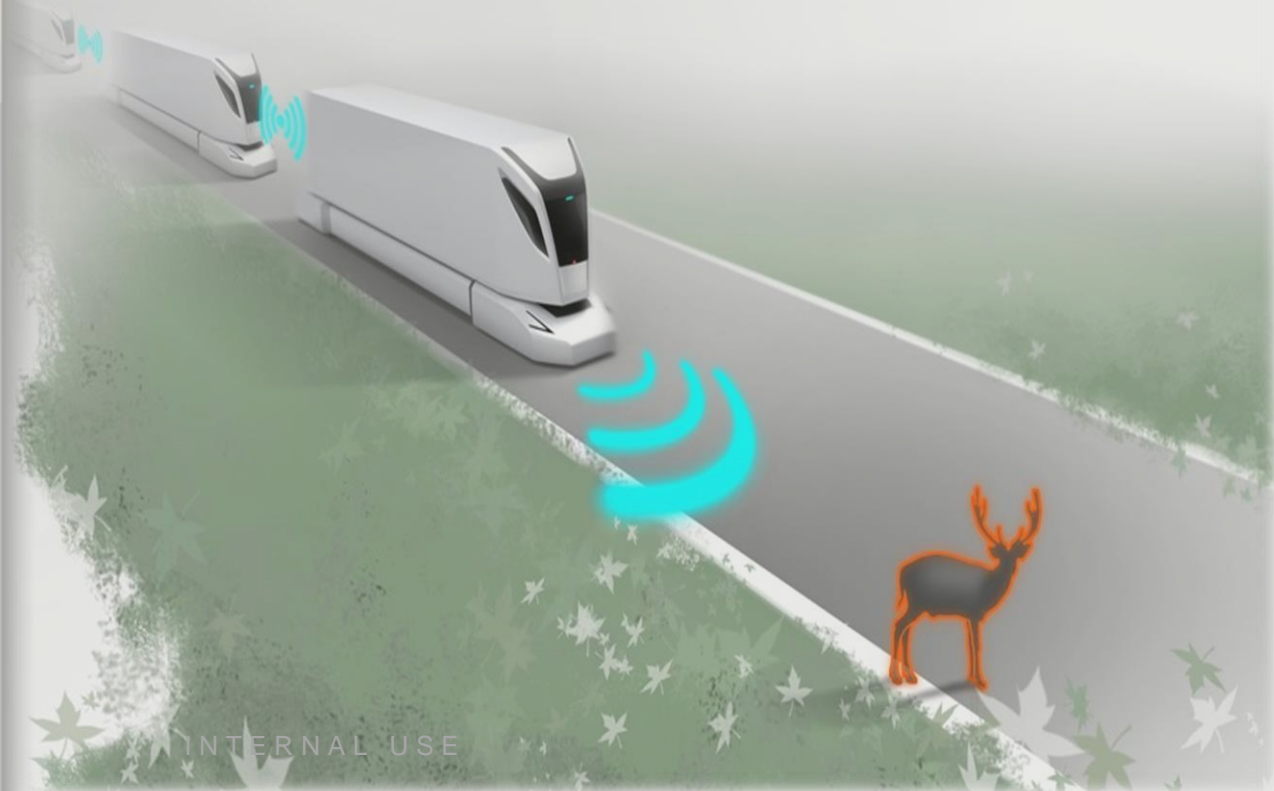
VEHICLE AUTOMATION &

SAFETY

DIGITALIZATION

Safety is key

- Low speed active safety systems targeting vulnerable road users in urban areas
- Secure high robustness of safety systems to handle variations in both traffic situation and driver behavior.



KEY PRIORITIES

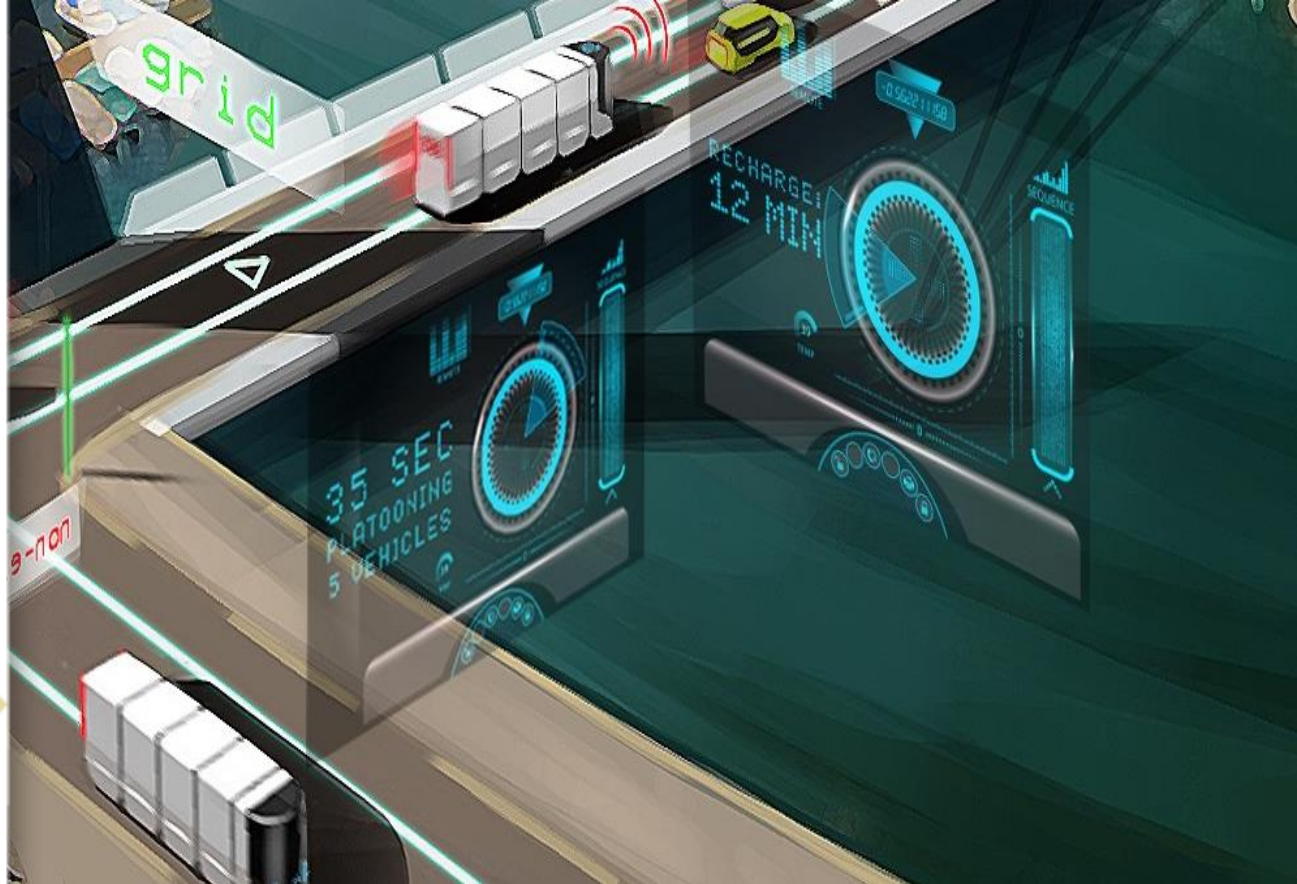
OUR PRIORITIES:

ENERGY EFFICIENCY

VEHICLE AUTOMATION &

SAFETY



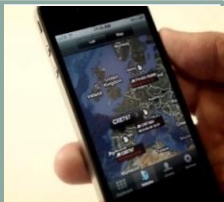

CONNECTIVITY



- Potential to significantly improve internal processes and products
- Opportunities for new services and solutions beyond individual vehicles.
- Requires a shorter time to market.
- Development in collaboration with customers

INTERNAL USE

Connectivity overview

		<h3>Example of offerings</h3>	<h3>Benefits</h3>
<p>Services driving improvement</p>		<ul style="list-style-type: none"> • Fuel Services • Driver Services • Safety & Security Services 	<ul style="list-style-type: none"> • Better effectiveness of transports • Better transport economics and loyalty • Improved safety
<p>Uptime and productivity services</p>		<ul style="list-style-type: none"> • Monitoring and communication • Predictive maintenance • Optimized performance 	<ul style="list-style-type: none"> • Better utilization of existing trucks • Higher customer loyalty/service rate • Improved value creation
<p>Connected mobile platforms</p>		<ul style="list-style-type: none"> • Improved routing • Increased fill-rate • Efficient administration 	<ul style="list-style-type: none"> • Better fill-rate of existing trucks • Increased transport efficiency • Higher customer productivity
<p>Big data & analytics</p>		<ul style="list-style-type: none"> • Generate internal insights • Enabler for new service offerings • Sale of data to external parties 	<ul style="list-style-type: none"> • Proliferation of data across value chain • New revenue streams • Increased efficiency and lower cost of transport

Technology Will Continue to Shape the Future



Easter morning, 1900. NYC Fifth Ave



Easter morning, 1913. NYC Fifth Ave

There are many levels of Technology Readiness

TRL 9

-

TRL 8

-

TRL 7

-

TRL 6

-

TRL 5

-

TRL 4

-

TRL 3

-

TRL 2

-

TRL 1

Technology Readiness Level (TRL) Process

NASA's quest to make jet engines quieter led to the development of chevrons, which moved relatively quickly through the TRL process to be deployed into the commercial marketplace.



TRL 8-9 (2005-now)

- Certification by the Federal Aviation Administration
- Deployed into market



TRL 7 (2001-2005)

- Validation of concept in flight
- Flight tests, final design



TRL 6 (1998-2000)

- Full scale tests for acoustics and aerodynamics
- Static engine tests

TRL 4-5 (1995-1997)

- Model tests for acoustics and aerodynamics
- Sub-scale model tests



TRL 3 (Early 1990s)

- Applications to small nozzles and airfoils
- Lab tests, concept on paper



TRL 1-2 (1980s)

- Fundamental investigations of air-mixing devices (tabs, chevrons, etc.)
- No specific application, basic research in fluid physics

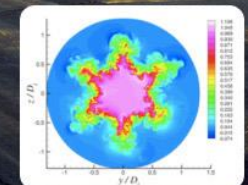
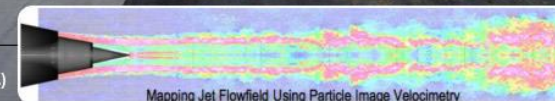
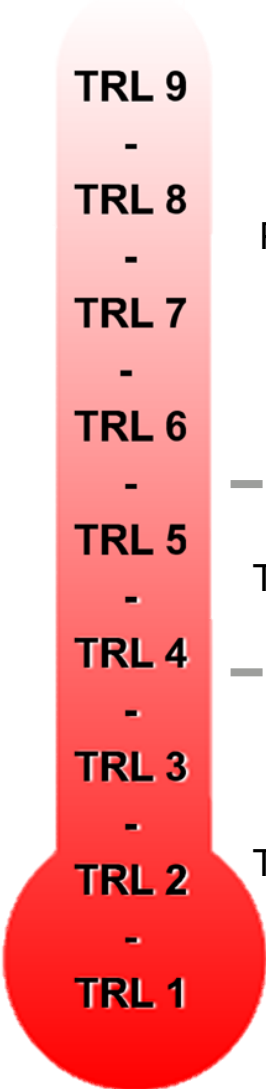


Image Credit: NASA / Maria Werries

TRL for Commercial Trucks



TRL 9

-

TRL 8

-

TRL 7

-

TRL 6

-

TRL 5

-

TRL 4

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TRL 3

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TRL 2

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TRL 1

Product Development
&
Industrialization

Technology Integration

Technology Development

Product Launched

Field Testing

Design Refinements

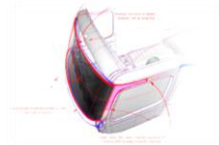
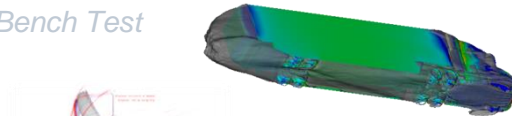
Verification & Validation

*Demonstrator /
Concept Truck*

Component / Bench Test

Simulations

Basic Principle



Example: SuperTruck Technology Content

Available today

Lightweight trailer
LED interior lighting & headlamps
Trailer gap fairing
Trailer tail fairing
Wide base low RR tires
Aluminum wheels
Aluminum drive shaft
TurboCompound
Downspeeding
'Eco-roll'
6x2 axle configuration
"wave" piston
Common rail fuel injection
1-box aftertreatment muffler
Engine downsizing

Evolutionary improvements

Improved cab thermal insulation
Trailer full skirts
Optimized bumper
Dual-zone 24V A/C system
15kWh energy optimized APU
Predictive kinetic energy recovery
Relocated A/C condenser
Predictive cruise control
Cab shape
Roof mounted solar panel
Parked fresh air intake
Variable oil & coolant pumps
Low friction oil
PCU friction reduction
Aluminum cab side walls

Breakthrough concepts

Curved & sloped windshield
Cab position
Artificial windows
Rankine Waste Heat Recovery
Light gauge trailer wire harness
>40% lighter chassis
Composite trailer aero devices
Lightweight (CF) hood
Lightweight (CF) roof
Lightweight (CF) chassis fairings
Covered cab steps
Tractor bogie fairing

Technology Integration: *Importance of integrated design*

“Optimizing the **parts** will not optimize the whole.”



*Systems Engineering Fundamentals
Ford Motor Company*

- A “system approach” helps ensure that *operational* requirements are met
- This process of *integration* (of components / technologies) delivers a mature system
- Integrated design often presents opportunities for product optimization (cost / weight / complexity)

Technology Evolution Through Demonstration

2013



2015



2017



2020

- ✓ Feasibility of PHEV & geofencing in port drayage
- ✓ Complete vehicle technology package
- ✓ PHEV#1 concept vehicle built & verified

- ✓ PHEV#1 in revenue service >6 months
- ✓ 'self learning' dynamic geofences & refined design to maximize ZE operation
- ✓ PHEV#2 concept built & in revenue service

- Integrate ITS / PHEV / EATS to minimize in-use NOx emissions
- Evaluate concept#3 in revenue service
- Evaluate pathway to commercialization



Productivity & Technology Integration

Our concept vehicles demonstrate more than just electrification

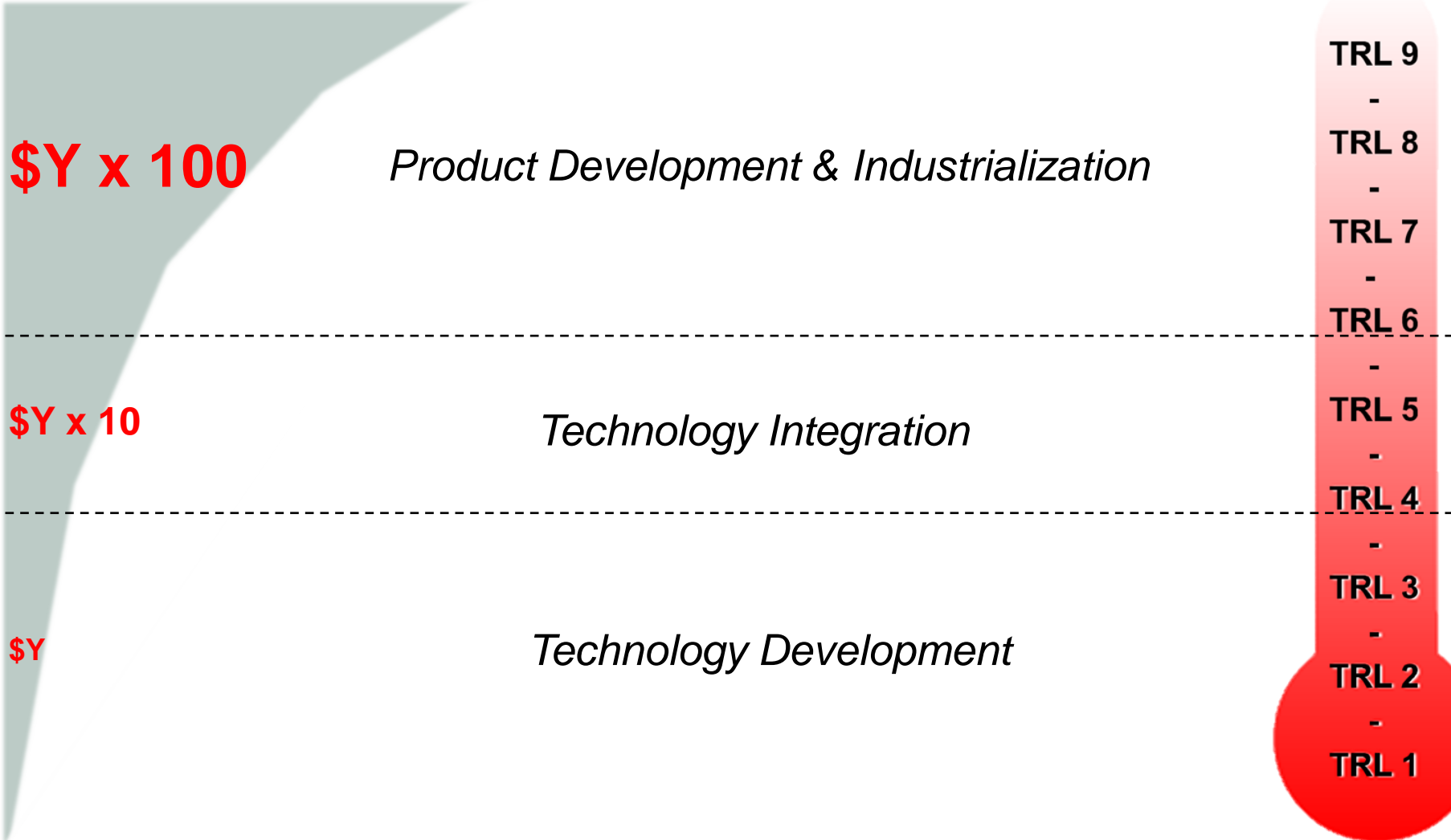


- ✓ Can replace a wheel loader one size larger
- ✓ Dramatic reduction in noise
- ✓ Improved visibility
- ✓ Ease of operation

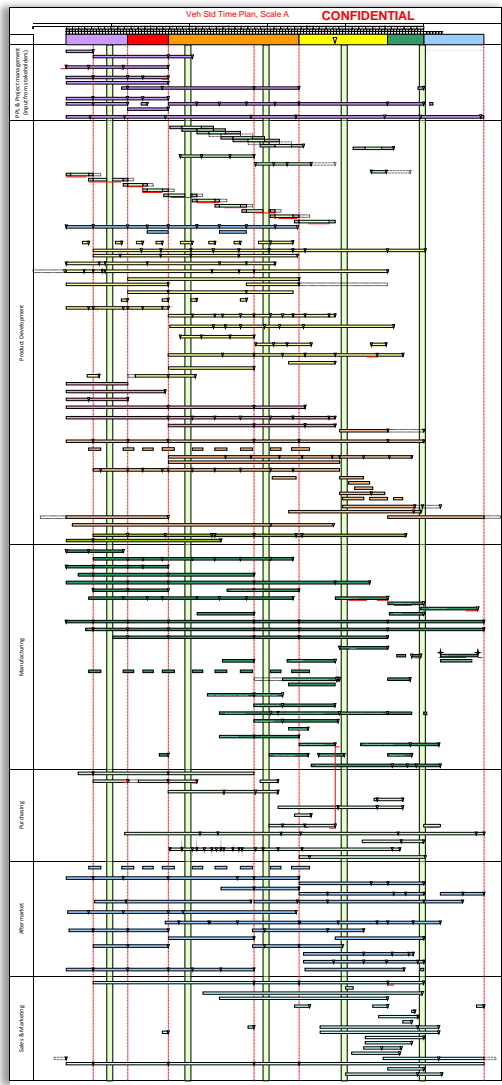


- ✓ Can carry 2,000lb more payload
- ✓ Less rolling resistance and tire scrub
- ✓ Improved maneuverability & steering
- ✓ Vehicle specs optimized for drayage operation
- ✓ Continuous improvements allowed downsizing plug-in battery by ~25%

Technology Readiness vs. Investments



Beyond TRL6: Development & Industrialization



Planning & Management

Stakeholder Input, Control, Governance, ...

Product Development

Design Iterations (Hardware & Software), Verification & Validation, Durability & Reliability, Certification, Field Testing, ...

Manufacturing

Input to design, Assembly line changes, Inventory, Logistics, Training,...

Aftermarket

Spare Parts, Technical docs, Dealer training, Emballage changes, Diagnostic Tools, ...

Purchasing

Supplier Agreements, APQP, Pricing, SQA, tooling, ...

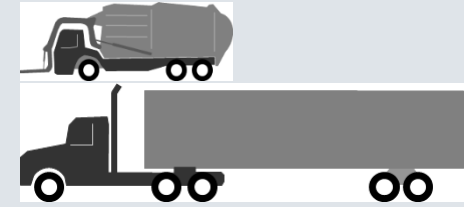
Marketing

Communicate new features, Target right customers,...

Trucks are customized for specific applications

Global Transport Segments

Regional Distribution



Interregional Haul



Demanding Longhaul



Heavy Construction



Light Construction



Heavy Transport



Productivity is key to a sustainable freight ecosystem

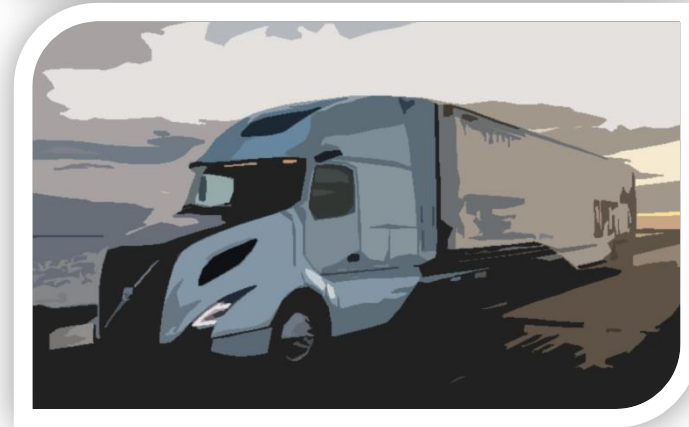
Truly sustainable freight means both environmental and economic sustainability.



Downtime
Payload capacity
Utilization
Maneuverability
Routing
Driver training
Connectivity

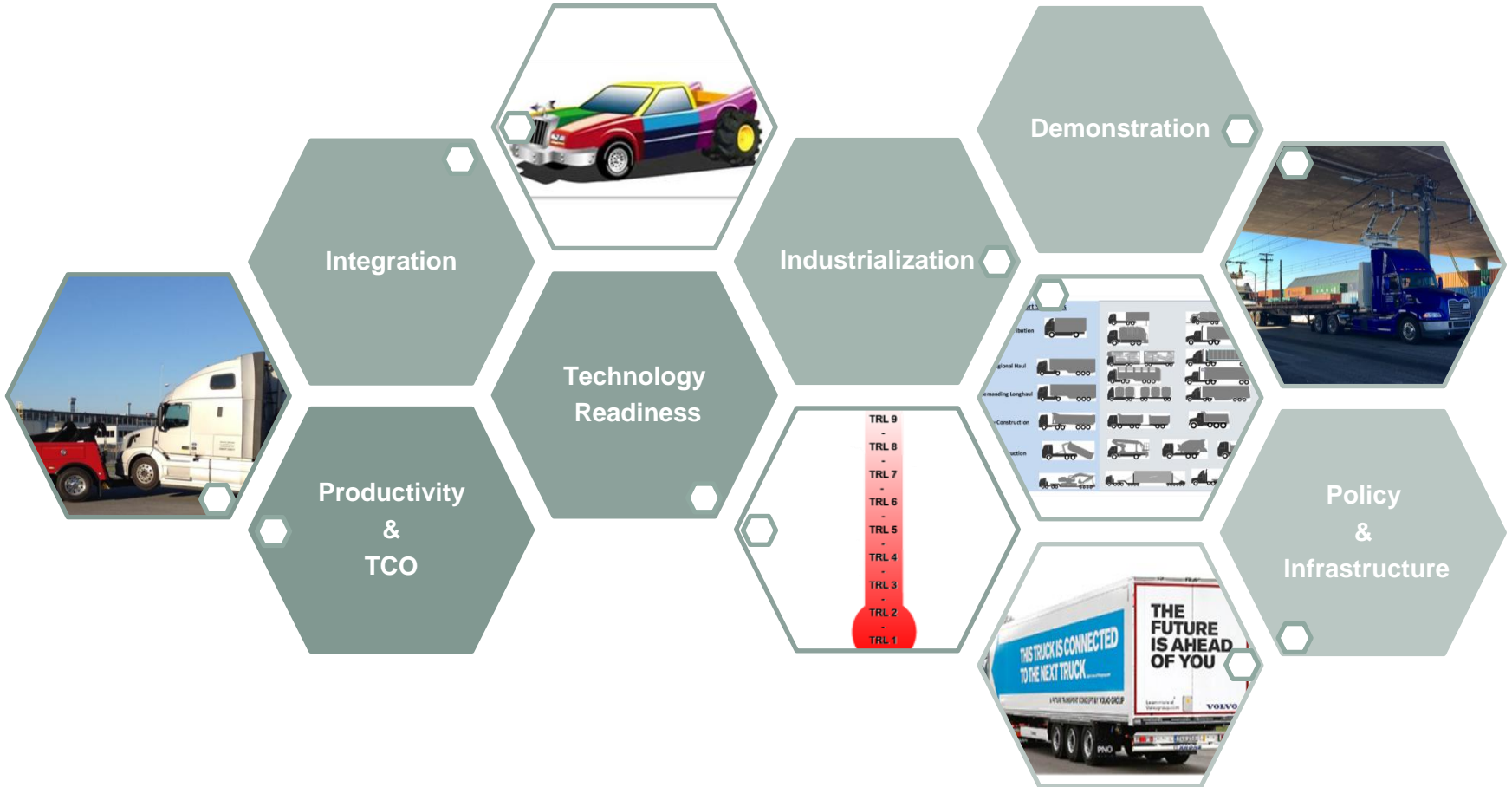
Increasing momentum around technology policies and deployment guidelines is needed

- System-level viewpoint - Transportation will be **connected, driver assisted/automated and electrified.**
- Our concept vehicles are building blocks of a larger transportation ecosystem.
- Example 1 - Clear policy positions and deployment timelines for connected vehicle infrastructure.
- Example 2 – Less restrictive permitting process and guidelines for testing and validating advanced driver assist/automated driving (for trucks).



There is no quick fix. Public and private entities have to work together to incentivize and safely roll out advanced technologies for sustainable cities.

Summary



Fleet Adoption of Advanced Technology Vehicles

Scott Cramer, Certified Freight Logistics

Dustin Coffey, TEC Equipment

Closing Thoughts

- Technology demonstration through pilot project is *less than 10%* of the overall cost and time to bring a product to market.
- *Customer solutions* are brought to market, not specific technologies.
- Involving customers is critical to ensure successful adoption of new technologies
- Endless factors beyond proof of technology influence “go to market” decision