

Intro to the IntelliDrive System

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System Engineering Contract

- Contractor Chosen
 - Lockheed Martin (prime), Iteris (subcontractor), Noblis (iv&v)
 - 15 month period of performance
- Project Tasks
 - Development of Refinements and Revisions to IntelliDrive System Concept
 - **Conduct User Needs Workshops with stakeholder groups**
 - Prepare a formal Concept of Operations (ConOps) document
 - Analysis and Development of Revised, Refined Requirements for IntelliDrive
 - Development of a Revised, Refined Set of Architectures for IntelliDrive
 - Analysis, Modeling, and Simulation (AMS) of IntelliDrive Architectures
- System Update Understanding

What is IntelliDriveSM?

- IntelliDriveSM is a suite of technologies and applications that use wireless communications to provide connectivity:
 - With and between vehicles (of all types)
 - Between vehicles and roadway infrastructure
 - Between vehicles, infrastructure and wireless consumer devices



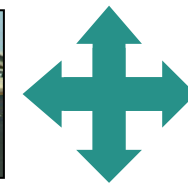
Drivers



Vehicles



Infrastructure



Wireless
Devices



Suite of Technologies and Applications

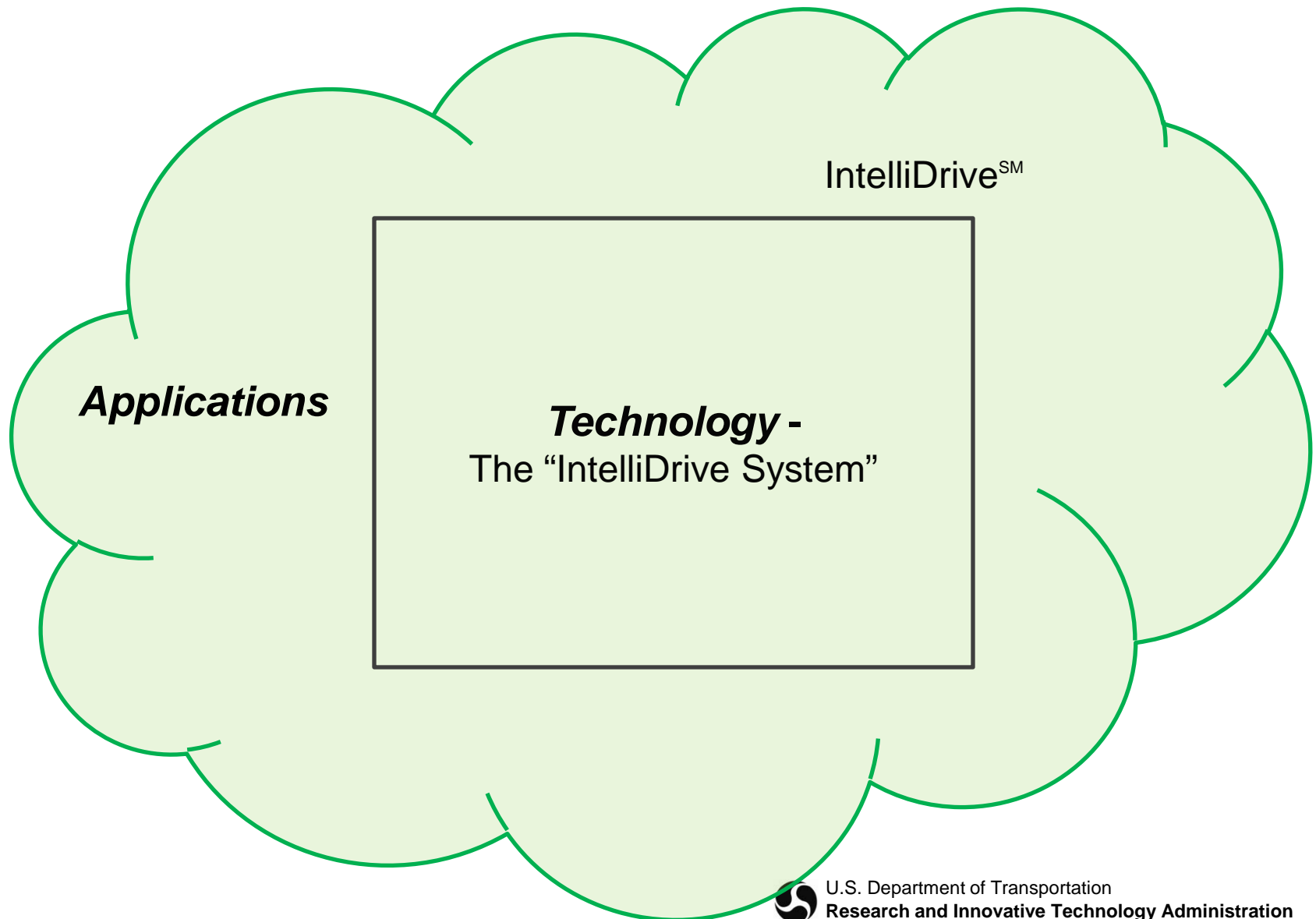
A slice through the
Machine-to-Machine
cloud reveals IntelliDrive



IntelliDriveSM



Suite of Technologies and Applications



Applications

IntelliDriveSM

Applications –
Specific things that bring about Safer,
Smarter, Greener Transportation

Technology
The “IntelliDrive System”



Technology

Applications

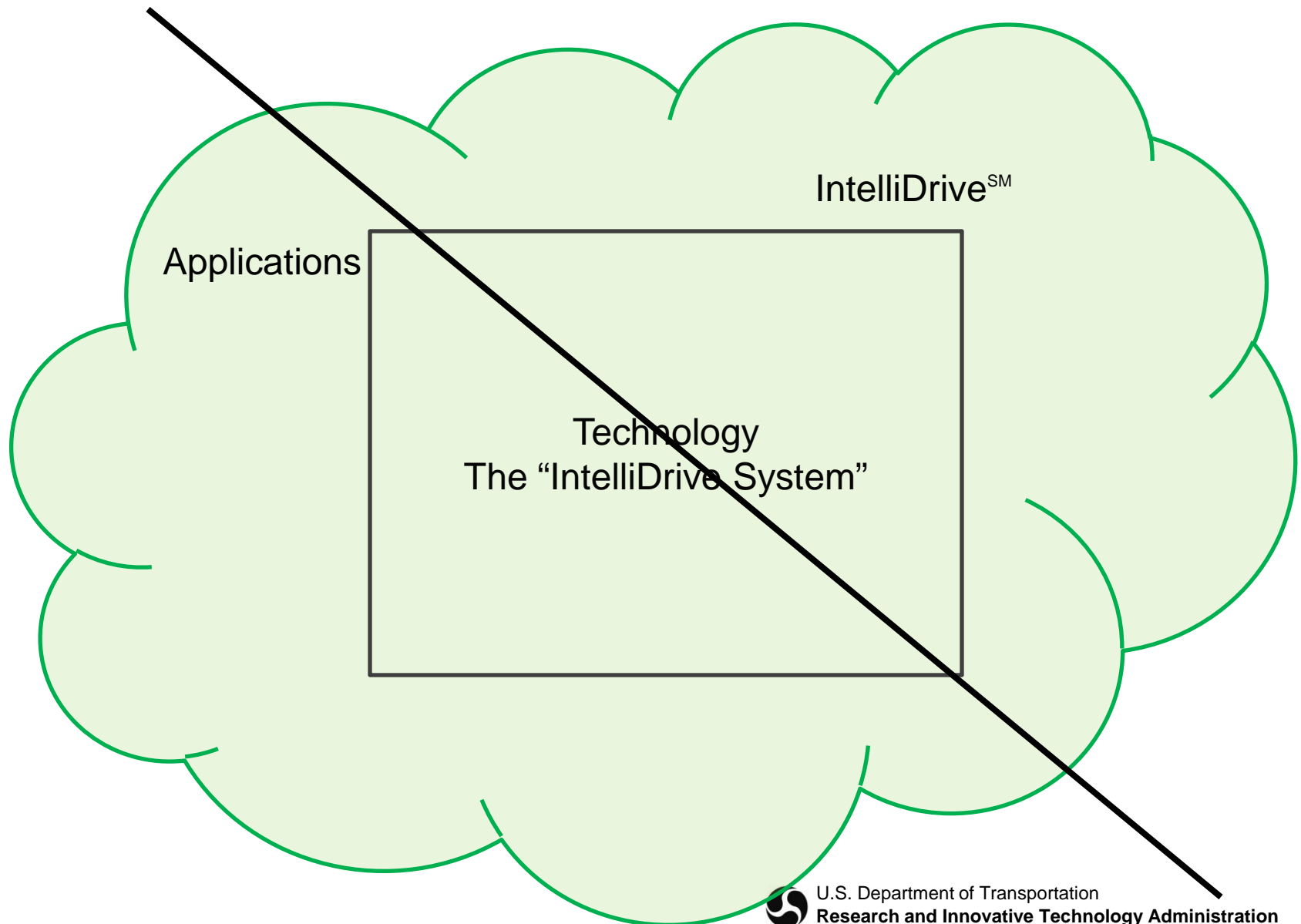
IntelliDriveSM

Technology: The “IntelliDrive System”

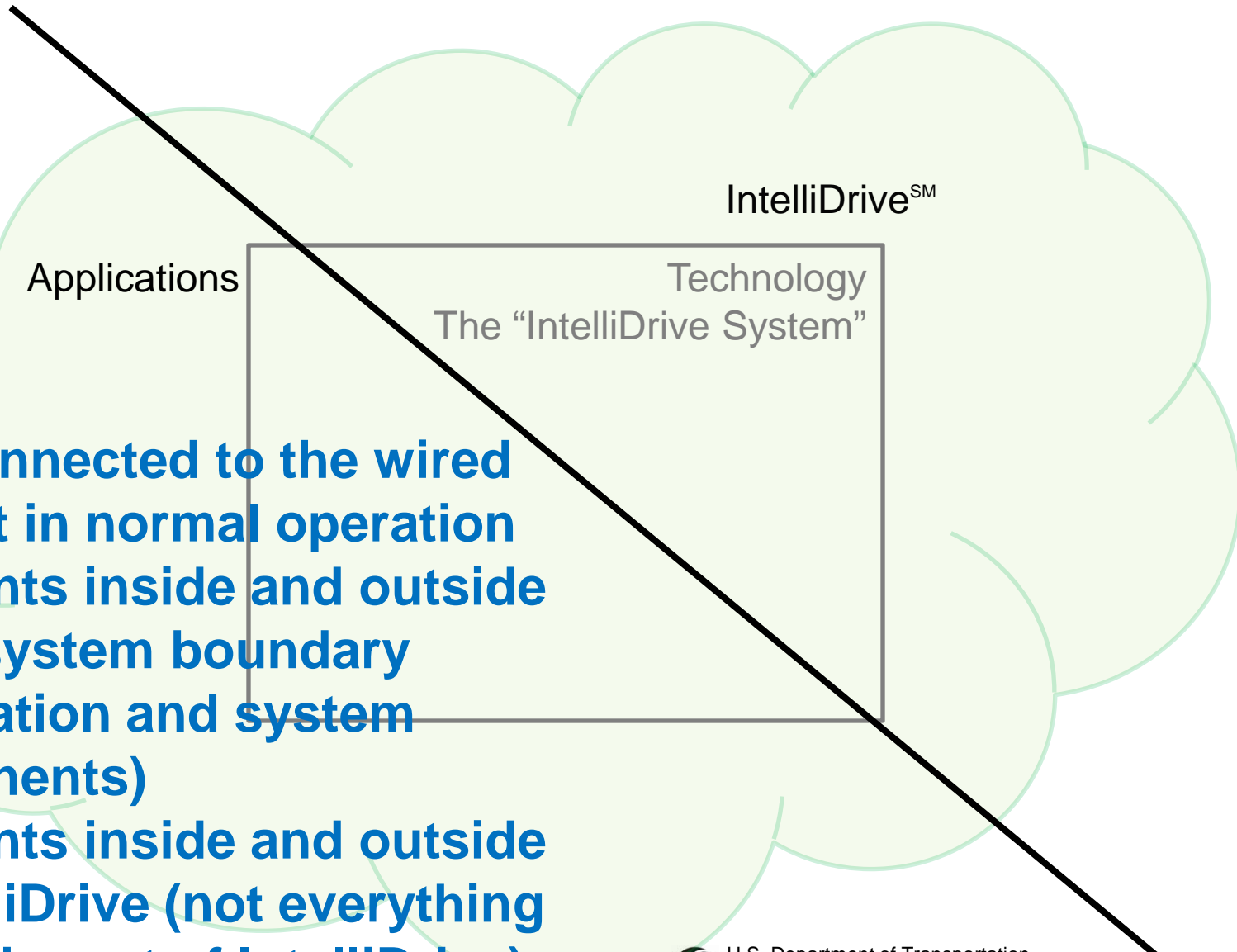
- Specific things that enable Applications
- Key attribute: Cooperative use of data
 - Enabled by packet-based communication using standards to define payloads independent of communication media or applications.**



Mobile / Fixed



Mobile



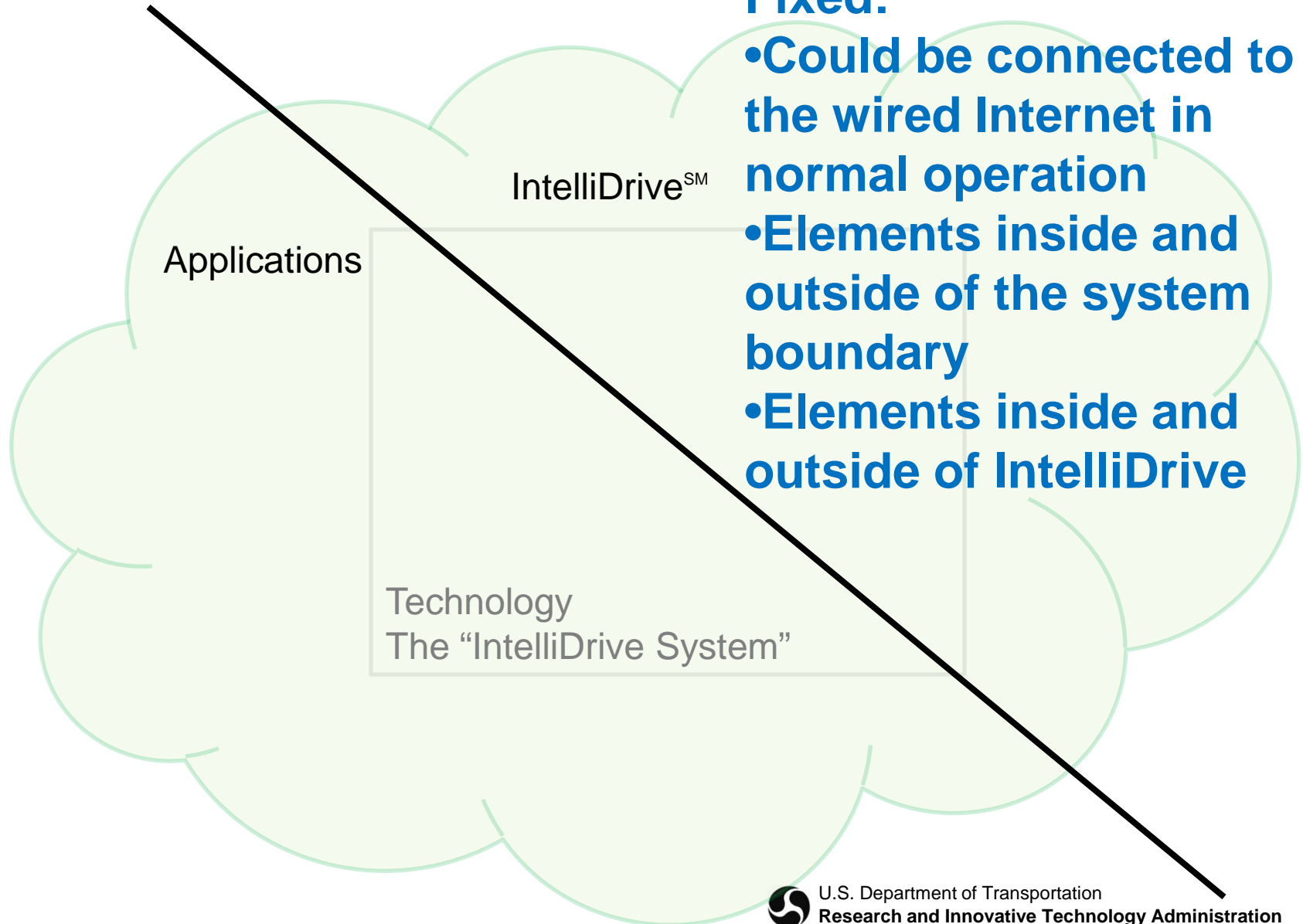
Mobile:

- Not connected to the wired Internet in normal operation
- Elements inside and outside of the system boundary (application and system components)
- Elements inside and outside of IntelliDrive (not everything mobile is part of IntelliDrive)

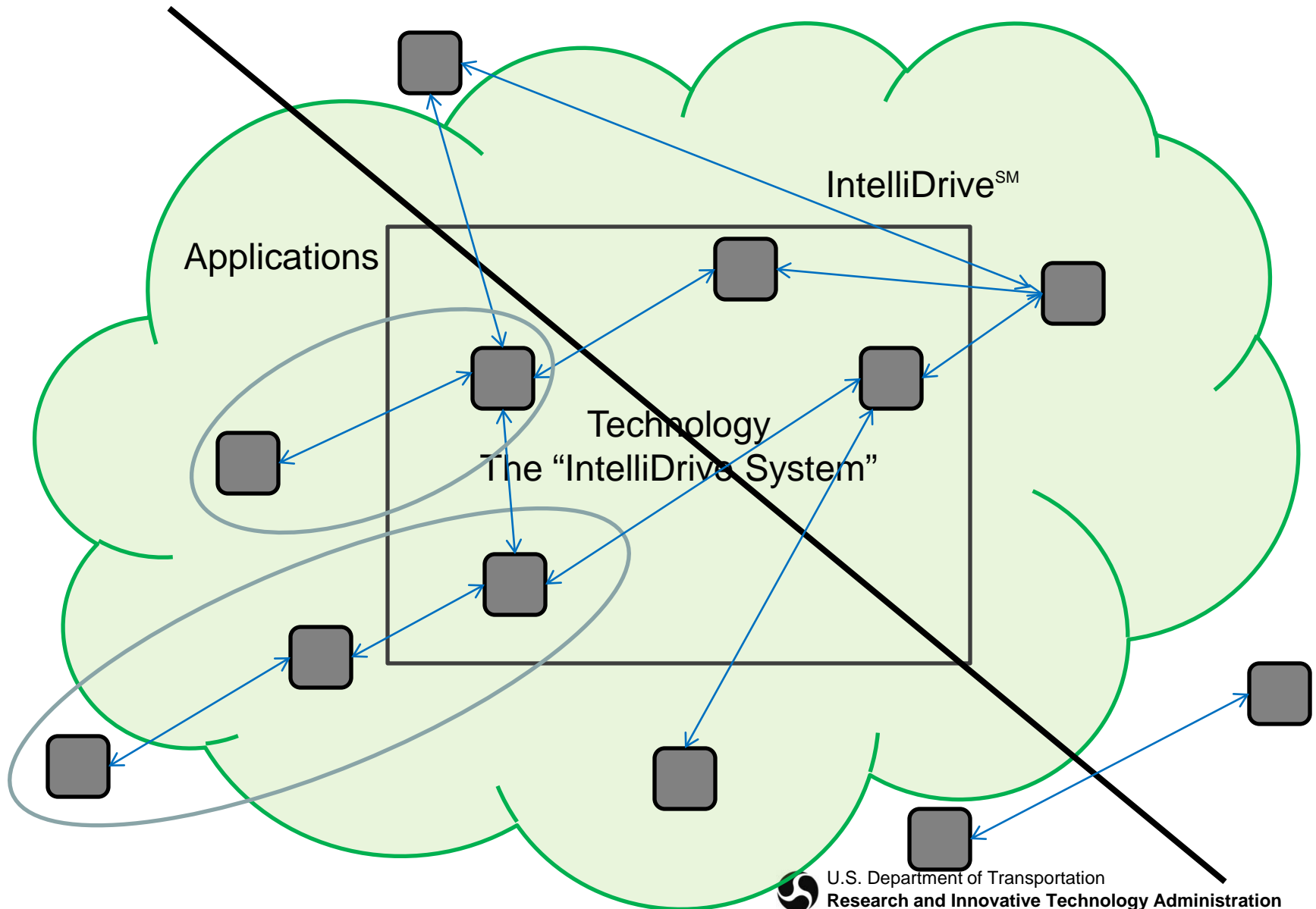
Fixed

Fixed:

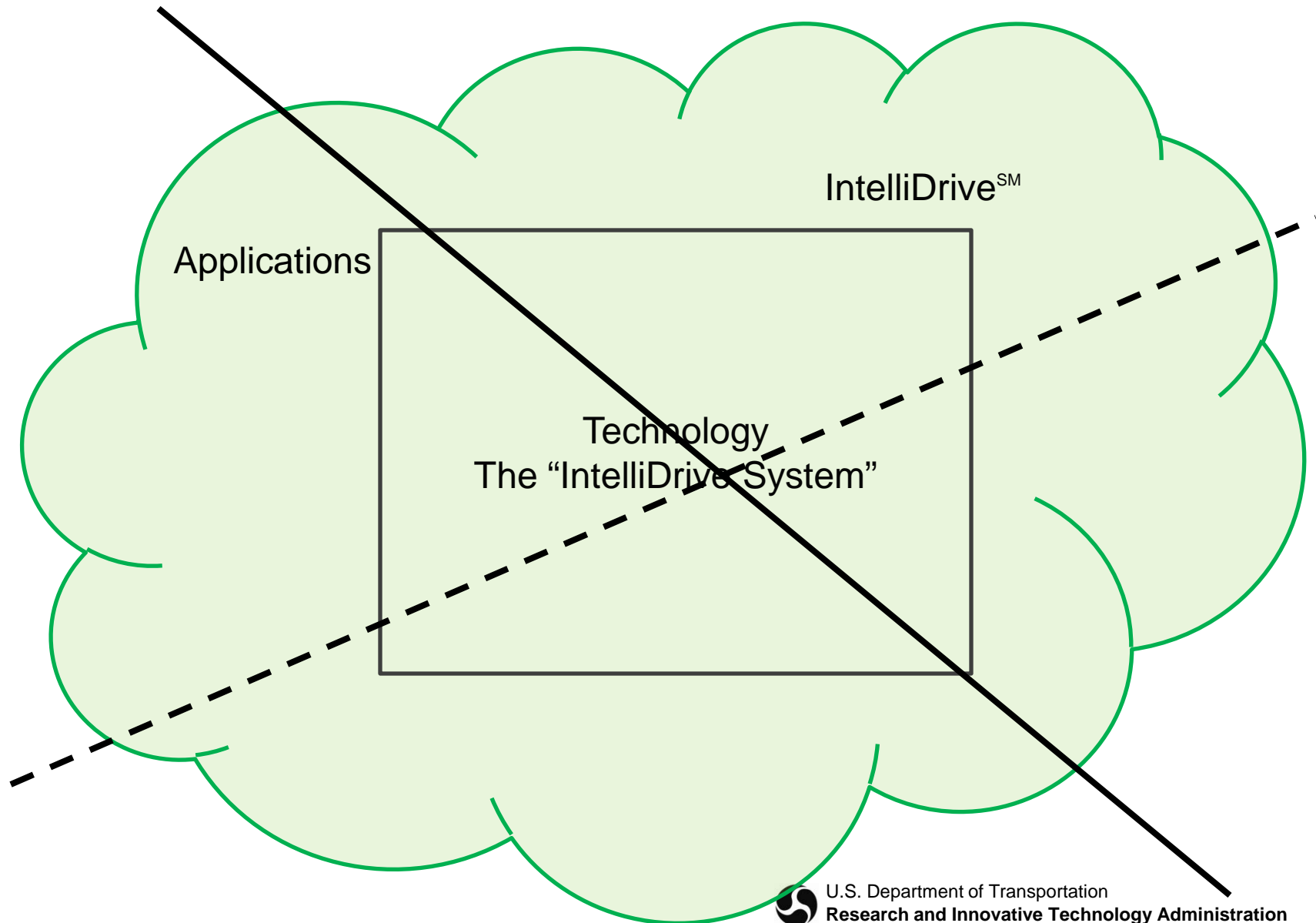
- Could be connected to the wired Internet in normal operation
- Elements inside and outside of the system boundary
- Elements inside and outside of IntelliDrive



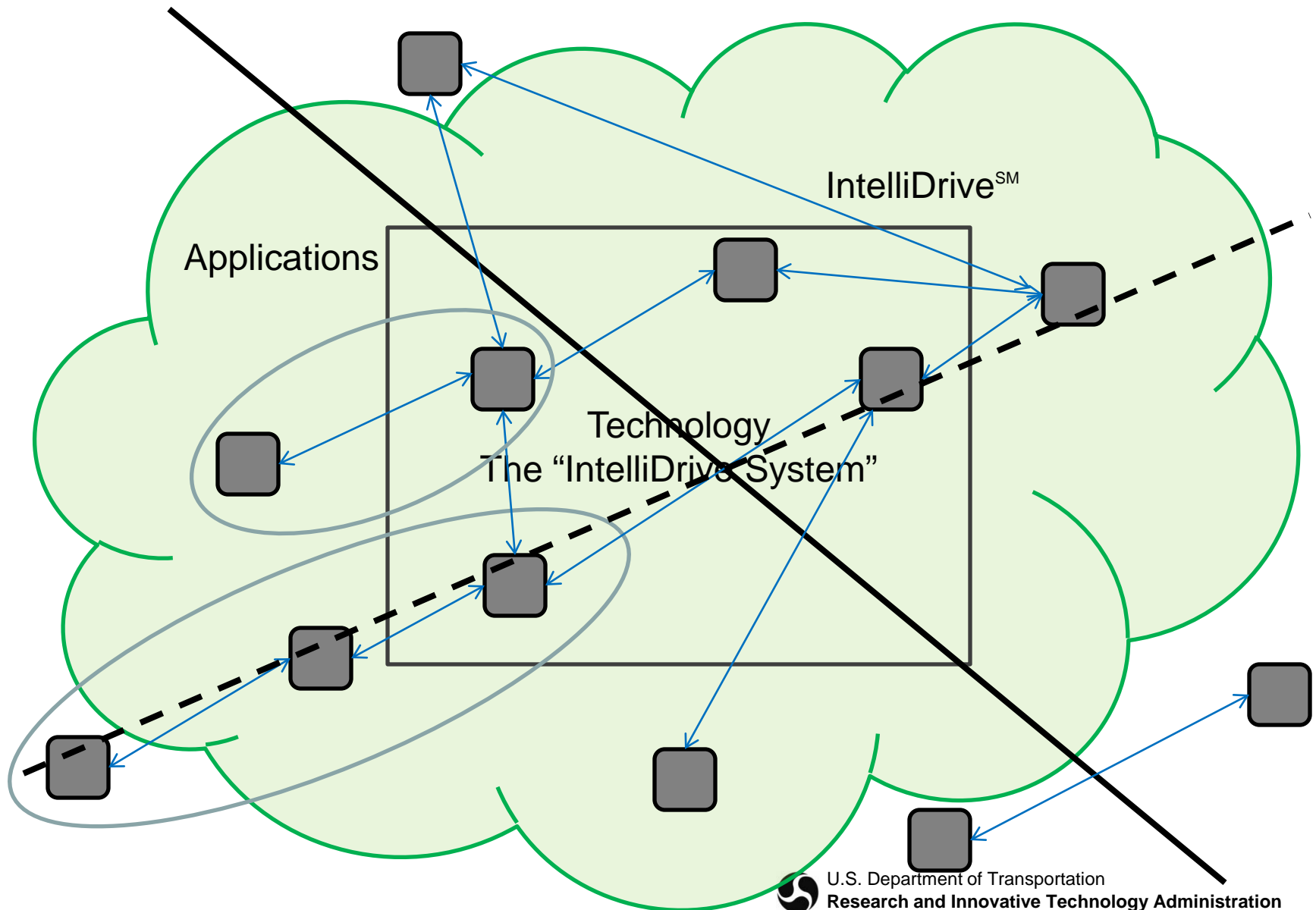
Collection of Black Boxes Connected by Interfaces



Areas of Interest – USDOT/Private Industry



Collection of Black Boxes Connected by Interfaces

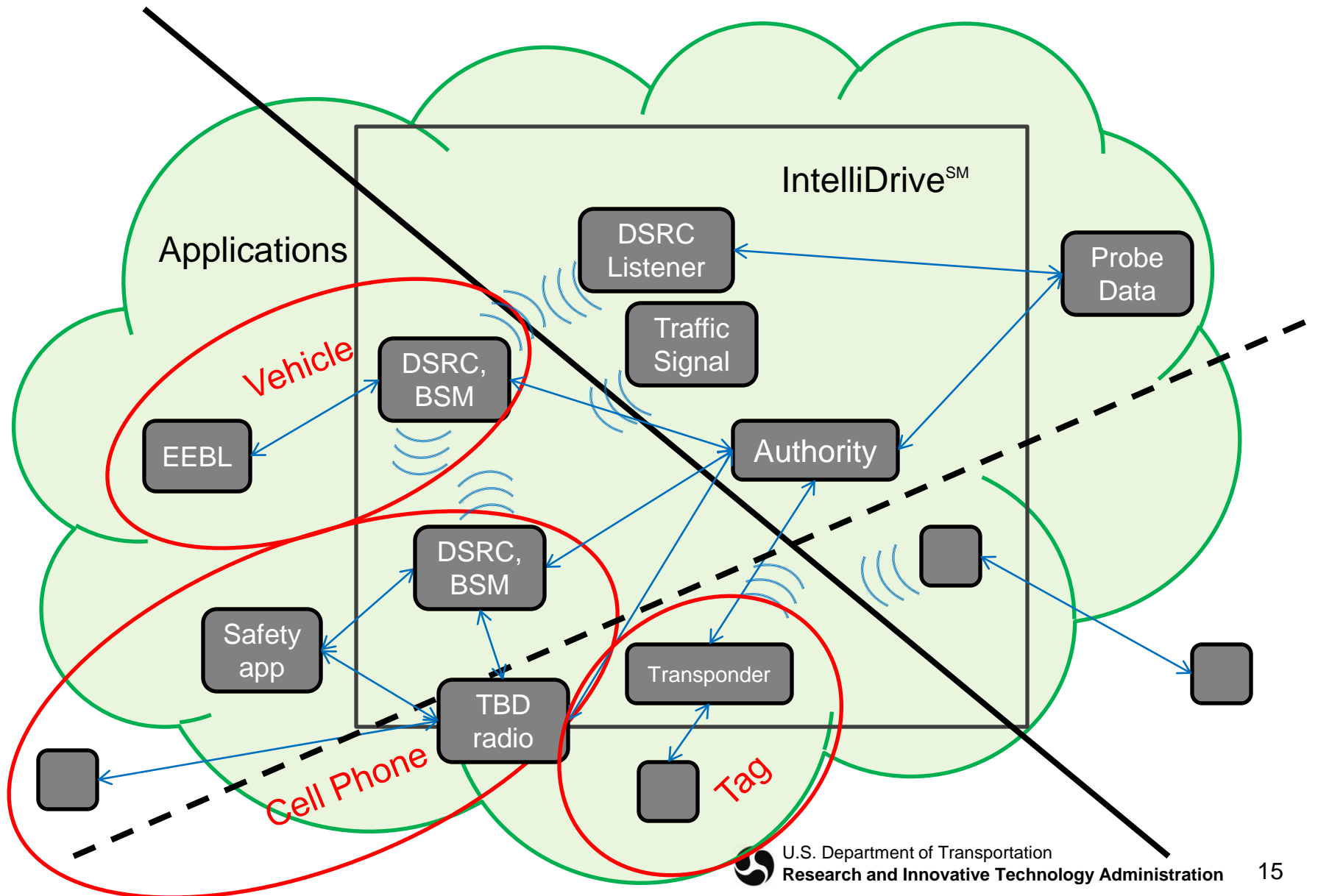


Early-Stage Deployment Communication Modes

Three likely fundamental communication modes that will be used to enable early-stage deployment applications:

1. Mobile to whatever (other vehicles, hand-held devices, roadside listeners, etc.) broadcasts (from one to many simultaneously). The principal medium for this will be 5.9GHz DSRC and the principal message will be the Basic Safety Message. The intended use of this communication mode will be V-V cooperative safety applications but there are many secondary uses such as traffic signal detector augmentation.
2. Fixed to whatever (vehicles, hand-helds, etc.) broadcasts (from one to many simultaneously). Again, the principal medium will be 5.9GHz DSRC and the principal messages will be Signal Phase and Timing and other related messages, and spot signage messages (such as work zone, curve speed, etc.) The intended use of this communication will be I-V safety applications but there are many secondary uses such as Eco Drive.
3. Mobile – Fixed, Fixed - Mobile unicasts (from one to one exclusively). In this case the medium may be 5.9GHz DSRC but could be other things. The principal messages will be a well defined set of messages needed to conduct a secure, non-reputable transaction. This could be used for many things such as signal priority schemes, security credential distribution, financial transactions such as toll payments and point of sale payments, and many other things.

Example: V-V Crash Avoidance



Evolution of IntelliDrive

▪Original model

- DSRC based
 - Infrastructure intensive using new DSRC technology
 - Vehicle turnover for embedded DSRC technology
- Start with V2I (all application types) and evolve into V2V (safety)

▪Current perspective

- Non-safety (mobility, environment)
 - Leverage existing data sources & communication types; include DSRC as it becomes available
 - Support development of key applications for public agencies
- Safety → DSRC based
 - Aggressively pursue V2V; leverage vehicle capability for V2I spot safety
 - Can leveraging carry-in/aftermarket products accelerate benefits?
 - Infrastructure requirement is still a TBD (security)

User Needs Workshops Plan

Workshop Dates	Meetings	Locations	USDOT Lead	ITSA Support	Notes
July 23	Rail & Transit User Needs Workshop	Chicago, IL	Yehuda Gross	Y	Tentative date and location. 1 day.
August 3	Aftermarket & Carry-In User Needs Workshop	Detroit, MI	Mike Schagrin SEMA CVTA	Y	Tentative date and location. 1 day.
August 5	CVO & Tolling User Needs Workshop	Chicago, IL	Kate Hartman	Y	Tentative date and location. 1 day.
August 9-13?	Broadcasts from Roadside & Vehicle User Needs Workshop	Vancouver, BC	ITE	Y	Tentative date and location. 1 day.
August 24-25	Public Meeting 1	Detroit, MI	ITE AASH TO	Y	Tentative date and location. 2 days. No WebEx required
August 31	Backhaul, Data Aggregators, & Network/Aftermarket & Carry-In User Needs Workshop	Palo Alto, CA	Mike Schagrin SEMA CVTA	Y	Tentative date and location. 1 day.
September 1-2	Public Meeting 2	Palo Alto, CA	ITE AASH TO	Y	Tentative date and location. 2 days. No WebEx required