The Future of Cooperative Transportation

Jianming Ma, Ph.D., P.E., PMP®
Director of Traffic Management Section

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Why Cooperative?

- Potential to eliminate or mitigate the severity of up to 80% of all unimpaired light vehicle crashes (NHTSA).
- Cars and infrastructure can work together to increase efficiency
- The best Autonomous Vehicle is COOPERATIVE.
  - Redundancy input for autonomous systems
  - Works in some areas that autonomy does not
Cooperative Transportation Technologies Will Yield SAFETY

National Crisis: Traffic Fatality Trend is in the WRONG Direction
- Promise of Cooperative Transportation (or V2X) technology is SAFETY
- Cooperative Transportation is needed to move us toward our goal

National Roadway Safety Strategy

United States Department of Transportation | January 2022
Cooperative Transportation Technology Deployments in the U.S.

SPaT Challenge Sites

Deployment Sites (USDOT data)
Texas Connected Freight Corridors

Source: Texas Connected Freight Corridors

The Future of Cooperative Transportation – TxACE Symposium

The Future of Cooperative Transportation – TxACE Symposium

= Highlighted applications are prioritized for development
On May 3, 2021, FCC modified the spectrum:

- Give the lower 45MHz to unlicensed use (Wi-Fi)
- Formally allow C-V2X (LTE-V2X) into the spectrum
  - Previously allowed in the spectrum only through “experimental license”
- Move DSRC (temporarily) to upper 30MHz (by July 2022)
- Phase out DSRC entirely (by about mid 2024)
Impacts of the FCC Order

Many agencies have “paused” their V2X work

- Conversion of DSRC to Channel 180 takes resources, time, and is temporary
- Replacement of DSRC is costly – why take the risk?
- Want FCC certainty and/or OEM commitment

Some agencies have continued to operate and deploy

- Moved DSRC to Channel 180 / Planned replacement
- Deploying C-V2X
  - Advancing the learning curve
  - Verifying the capabilities of C-V2X
Moving Forward with Cooperative Transportation

Regulatory Certainty

- It has been decided: we have 30 MHz & C-V2X
  - Legal action to retain 75 MHz was not successful
  - Note: C-V2X / LTE-V2X is NOT 5G

- Need Final Operating Rules - FCC 2nd Report & Order
  - Broadcast power limits everyone can live with
  - Permit process

- Need Waivers from the FCC to Operate in Near Term
  - Currently pending . . . And pending . . .
Moving Forward with Cooperative Transportation

Trust in the System

- Vehicles need our messages (MAP, SPaT, RTCM) to be:
  - accurate, consistent, reliable and secured
- How do we verify that this is the case?
- Start with existing, uniform guidance:
  - Connected Intersection Guidance – uniform deployment guidelines (USDOT / ITE CTI 4501 v01.01)
  - Roadside Unit Standard (USDOT / AASHTO / NEMA / SAE / ITE CTI 4001 v01.01)
  - MAP Guidance - uniform MAP creation guidelines (CV PFS)
Moving Forward with Cooperative Transportation

Trust in the System

- Continue to develop and refine:
  - Verification process and test tools – (CV PFS / CAMP)
    - More work and more involvement needed
  - Tools to verify consistent broadcasts over time - (CV PFS / CAMP)
  - System for certificate distribution from a common trust chain (SCMS Manager)
Moving Forward with Cooperative Transportation

OEM Commitment

- For V2X to be successful in saving lives, we need widespread IOO and OEM adoption
- We can’t achieve Safety without V2X in production vehicles
Vehicle-to-Everything (V2X) Communications Summit

- We need to use what we have: 30 MHz and C-V2X
  - USDOT Testing of C-V2X indicates that the technology will meet our needs
  - More C-V2X testing is needed to work out some congestion and interference issues
- The FCC needs to establish regulatory certainty: waivers, operating rules, permanence
- The OEMs need to commit to deployment (which requires the above certainty)
- The USDOT needs to provide leadership and a national plan
  - USDOT committed to develop a national plan/ vision for an inter-operable system
Cooperative Transportation Data Framework

- Leverage third-party solutions to distribute and collect road vehicle data
- Supplement to traditional CV infrastructure
  - Support data distribution beyond equipped roadway
HELP

#EndTheStreakTX
End the streak of daily deaths on Texas roadways.

TxDOT.gov (Keyword: #EndTheStreakTX)

#EndTheStreakTX Toolkit
Jianming Ma, Ph.D., P.E., PMP®
Director, Traffic Management Section
Traffic Safety Division
Texas Department of Transportation