

Connected Intersections

Plenary Meeting

The following are meeting minutes from a plenary meeting of the Connected Intersections Implementation Guide project on June 21, 2021, scheduled from 2:00 PM to 5:00 PM by web conference.

All times in EDT.

An agenda is provided.

Call to Order & Welcome

The ITE anti-trust guidelines were reviewed by Siva Narla.

Roll Call of Committee Members:

Roy Goudy (co-chairs)	Jay Parikh	Christina Spindler
John Thai (co-chairs)	Raj Ponnaluri	Ray Starr
Justin McNew	Faisal Saleem	Mike Stelts
Jim Misener	Ed Seymour	Vivek Vijayakumar
Whitney Nottage	Mike Shulman	

A quorum was reached.

Other Participants included:

John Abraham	Dean Deeter	Li Jiangchen
Tony Ahmad	Drew van Duren	Steve Kuciemba
Justin Anderson	Julie Evans	Vivek Vijaya Kumar
Michelle Arnold	Omar Faruk	Alexander Lemka
Austin Averkamp	Chuck Felice	Virginia Lingham
David Aylesworth	Michael Finochio	Mike Lockerman
Kingsley Azubike	Ed Fok	Tom Lusco
Kevin Balke	Maureen Gardiner	Michael Maile
David Benevelli	Anthony Gasiorowski	Mateusz Malinowski
Ralph Boaz	Eric Gionet	Jim Misener
Ryan Bollo	Joseph Gorman	Ashlyn Morgan
Mary Lynn Buonarosa	Guoyuan	Masoud Motamedi
Patrick Chan	Mohammed Hadi	Suzanne Murtha
Hassan Charara	Ryan Hall	Siva Narla
Charlie Cheng	Nicholas Hegemier	Iouri Nemirovski
Alan Clelland	Craig Hinners	Frank Perry
Bronwen Crowe	Matthew Huerta	Subhadipto Poddar
Deborah Curtis	Shah Hussain	Chris Poe
Alan Davis	Manny Insignares	Neal Probert
Richard Deering	Peter Jager	Tony Qiu

Robert Rausch
 Brian Reed
 Randy Roebuck
 Faisal Saleem
 Robert Saylor
 Brandon Schlueter
 Kellen Shain
 Asfand Siddiqui

Steve Sill
 Brandon Stakleff
 Purser Sturgeon
 Nicola Tavares
 Danyang Tian
 Thomas Timcho
 Malcom Tomatani
 Jonny Turner

Jimmy Upton
 Kevin Viita
 William Whyte
 Jeannie Willis
 April Wire
 Qingyan (Ken) Yang
 Kun Zhou

Meeting Purpose and Objectives

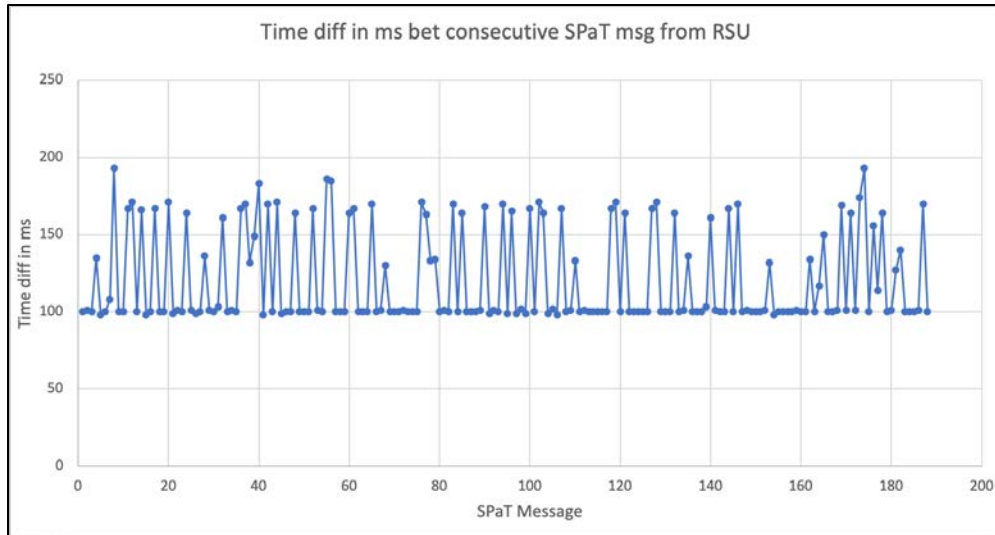
- Roy Goudy discussed the meeting purpose, objectives, progress to date, and validation phase details.

Field Verification and Conformance Testing

- Christina Spindler discussed the Validation Subcommittee, field verification/conformance testing, feedback on CI Implementation Guide, results of field data analysis, and schedule of Proposed Draft Final.
- Spindler discussed the Evaluation Subcommittee and the validation sites (weekly meetings on Thursday @ 12 – 1 PM). Validation activities expected to be completed in July.
- Jay Parikh discussed the field verification and conformance data testing and gave an update on the progress from each of the validation sites.

Participants	Msg Log	# of Test Intersections	Remark
Caltrans	PCAP	4	Processed analysis, summary report and visualization
City & County of Denver	RSU PCAP	8	Processed analysis, summary report and visualization
City of Anaheim			RSU firmware being updated.
Clark County (WA)	PCAP		Received 3M sniffer for capturing PCAP.
DriveOhio	PCAP	11 + 5	<ul style="list-style-type: none"> • Sample test files. Wireshark and Kapsch tool OBU capture • 5 Intersection test files from Dublin using Kapsch & PCAP
Florida DOT	PCAP	5	Test files in PCAP converted to JSON. AM peak & off peak test data Processed analysis, summary report and visualization
Georgia DOT	PCAP	2	Processed analysis, summary report and visualization
Maricopa County DOT	Kapsch	6	Field data process in progress
Panasonic	PCAP (C-V2X)	1	More C-V2X test data this week with 1609.2 security turned on
San Diego	PCAP		Field test data of about 7 intersections by end of this week
Univ. of Alberta			Due to Covid restrictions, field and lab activities are limited, focusing on reviewing CI Implementation Guide
UMTRI	JSON	7 + 8	1 st Batch: May 5; 2 nd Batch: May 13. Processed analysis, summary report and visualization
Utah DOT	PCAP	4 (DSRC) 4 (C-V2X)	Field data from 4 DSRC intersections in progress Field data from 4 C-V2X intersections is expected soon

- Jay Parikh discussed observations from field test analysis (SPaT and MAP Message Visualization).



- Are these times security enabled?
 - Jay: Not to my knowledge. Will hear back from agency soon to verify.
- Are these times typical or extreme?
 - Jay: Typical from point of view that we need to add additional data elements as defined in J2735. From MAP perspective, some of the missing data points are not typical.
- Periodicity change from 100-180 ms...did this happen in multiple places?
 - Jay: Yes – noticed that because the controller, RSU and OBU are all using different time sources. This can cause time to not be maintained at 100 ms.
- Bob: It's never less than 100ms...implies that it is dropping or missing SPaT message somehow. Never see anything coming sooner than 100ms from the last message.
 - Jay: Don't see any messages missing. The time stamp from the current message and I look at what's in the next message...that's the time in between that I'm showing here.
- Fixed vs. traffic dependent operation...how does the RSU know which mode it is operating in?
 - Jay: RSU gets data from controller. Controller knows whether its fixed time vs. traffic dependent.
 - Kevin Balke: The controller does not know if it is fixed or actuated. Later clarification - most controllers need to be configured to be in fixed time.
- William Whyte gave a security update including security questionnaire progress (responses received to date).

Validation Sites Feedback

OmniAir Plugfest (Randy Roebuck)

- Certification Scope Release
- Collaborative and Cooperative event with device manufacturers, test equipment providers and test laboratories to verify test cases, automation/TClv3 interfacing and interoperability:
 - 3-day Bench Testing

- 2-day Field Testing
- Observations
 - Mike Schulman: The data you collected is the same data Jay was talking about, right (testing red light violation warning application)?
 - Randy: Yes.
 - Frank Perry: I did not witness anything but I can tell you that the RSUs are broadcasting SPaT and MAP, we evaluated MAP messages that were already provided by MCity. We regenerated two of them. We were not broadcasting position corrections. Didn't go to the extent of what's defined in the CI document yet. Future tests will be more rigorous.
 - Tom Timcho: I was data recorder in many V2V tests → EEBL: I was very pleased with both the positive behaviors (timing, location) as well as the absence of false positives. Across the board, everything was favorable. Believe this was the case for every vendor there for the EEBL testing.
 - Ralph: Nothing special in the message as far as the message fields are concerned for red light violation warning (aside from min end time = max end time and that would be indication to vehicle that there would be an end to the green condition). Mostly testing of the controllers to make sure it is doing the right thing.

Caltrans (Kun Zhou, Asfand Siddiqui)

- MAP (pcap) at four intersections along El Camino Real (ECR)
- MAP includes four types of Connection between traffic lanes:
 - Ingress-egress
 - Egress-ingress
 - Lane merge
 - Lane diverge
- Most of the comments from CI MAP visualization observations are on the last 3 types of connection
- Anthony: Did the map process use the USDOT tool?
 - Kun: Created a map before the USDOT became available. We used google earth.

Florida DOT (Raj Ponnaluri)

- Gainesville SPaT Trapezium Project
 - 27 signalized intersections, Siemens RSUs
 - Examined availability of mandatory data elements in the data (UF/Siemens/FDOT) – needed more efficient way of producing visualization charts and tables
 - Provided CSV data to ITE for running CAMP's SPaT/MAP analysis script

Georgia DOT (Alan Davis)

- Working on:
 - Provide RTCM through the RSU
 - Changes to MAP messages
 - Conversion from PCAP to JSON

- Will provide feedback on requirements

Panasonic (Mateusz Malinowski)

- Smart Mobility office in Denver developed a custom C-V2X and DSRC CI data collection tool
- Submitted secured C-V2X CI data consisting of SPaT, MAP, and RCTM from lab test intersection for evaluation
 - Data proved to be RLVW Implementation Guide compliant with exception of DE_RoadRegulatorID
- Mike Schulman: Lab Test Intersection ... what do you have deployed in the field supporting this?
 - Mateusz: Supporting by providing test lab environment. We don't have intersections that we "own" – this is done in lab.
 - Mike: What sites are supported through lab test intersections?
 - Mateusz: Can't disclose – but running Intelight controller, Kapsch test unit, multitude of OBUs interfacing with RSUs.

San Diego (Brandon Schlueter)

- Used to create freight service priority
- Implementing OBUs on trucks, installed radios on traffic signals, and there is a wireless network along corridor to provide communication
- Able to see live SPaT data, and integrating data from trucks to get that online

UMTRI (Mary Lynn Buonarosa, Brian Reed)

- 75 DSRC RSUs
 - 61 intersections broadcasting SPaT/MAP
 - 4 midblock crosswalks broadcasting PSMs
- ITE CI Data Collection
 - 4 of the 61 intersections
 - 3 time periods (AM rush, midday off peak, PM rush)
- Kapsch tool in vehicle setup
- Collected roughly 7 mins of data at each intersection
- DSRC/GPS antenna setup and wiring
- DSRC capture and log to Kapsch test unit → Kapsch test unit and message analysis → Map dissect and analysis

UDOT (Chuck Felice)

- Difficulty obtaining 3rd party CAMP verified tool
- Almost 200 RSUs deployed
- Using Kapsch tool (need OBU – so used current OBUs that allow them to collect data (PCAP files))
 - This built-in logging functions has worked for them.
- Google imagery seems to be better than the ISD imagery (Bing)
- Collecting at peak times, happy with collection of PCAPs so far

Maricopa County (April Wire)

- Broadcasting SPaT and MAP
- Using Kapsch tool → successful in the last couple of weeks in collaboration with UofA team (Larry Head)
- Didn't collect any time stamps, so going to try again to collect those
- Collecting multiple intersections rather than one data at a time, going to try to correct that

Add On/Follow On Activities

- Siva gave an update on the add-on activities and the proposal (still not approved). CI Implementation Guide is still to be published on September 17, 2021.
 - o Jim: What is the period of performance of this extension?
 - Siva: June 2022
 - o Any consideration to add RTCM?
 - Siva: We are considering that (as a follow-up activity).
- Siva gave an update on the follow-on activities. As suggested by the CI Committee, ITE submitted proposed Follow-On Activities to USDOT as a comment. No assurance of acceptance by USDOT.
- Draft proposal provided after the May CI Committee Meeting. Received feedback and proposal was updated.
- Steve Sill: As part of routine contract activity, USDOT requires that SDOs consult with constituencies at least once/year and send to us a list of recommended contracted standards activities for the following year – can be updated at any time a minimum of one time. We have received that and this will inform the internal budget request for fiscal year 2022. Depending on how this evolves and what is approved, then no sooner than the end of this calendar year we will be back in touch with ITE regarding what we will be able to support in Phase 2.
- Siva reviewed short- and medium-term follow-on activities.
- No guarantees of Phase 2.

Project Schedule

- John Thai gave a summary of the project schedule.
 - o Validation phase: April – July
 - o Publish Final Implementation Guide Document (September 17, 2021)
 - o Next CI Committee: July 19, 2021, 3:00 – 5:00 PM ET

Final Remarks

USDOT

- Deb Curtis: Thanks everybody – happy with progress.
- Steve Sill: Thanks for your efforts!

ITE

- Siva: Amazed with progress. Everyone has worked so hard to collect data – you guys are the real stars.

Meeting adjourned at 4:34 PM ET.