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| to: | Travis Jensen |
| from: | Gregory S. Macfarlane, Ph.D., PE GRANT G SCHULTZ, PH.D., PE, PTOE |
| subject: | IMT Deployment Optimization IMT PERFORMANCE: PHASE III November Tac MEETING |
| date: | 22 March 2022 |
| CC: | Technical Advisory Committee MEMBERS |

# Date and Time

The IMT deployment optimization meeting was held on March 22nd, 2023, from approximately 3:00 pm until 4:00 pm. The meeting was conducted via Google Meet, and participants participated remotely.

# In Attendance

* Travis Jensen, Transportation Engineer, Project Manager
* Kelly Pecheux, AEM Corp. Direct of Transportation Operation and Safety
* Jalaine Hawkes, Utah Highway Patrol
* Roger Frantz, Utah Highway Patrol
* Gregory Macfarlane, BYU Associate Professor
* Grant Schultz, BYU Professor
* Brynn Woolley, BYU Research Assistant
* Daniel Jarvis, BYU Research Assistant
* Joel Hyer, BYU Research Assistant

# Agenda

1. IMT Performance Measures Phase III Project Update (Grant Schultz / Joel Hyer)
2. IMT Simulation Project Update (Greg Macfarlane / Daniel Jarvis)
3. Additional discussion
4. Schedule next TAC Meeting (for IMT Simulation): Proposed end of May 2023.

# Announcements

Dr. Grant Schultz opened the meeting and provided a brief update on the status of the IMT Phase III project. Joel Hyer then presented the IMT Phase III PowerPoint to the attendees. Following the discussion of Joel’s presentation, Dr. Gregory Macfarlane, Brynn Wooley, and Daniel Jarvis shared their IMT Deployment Optimization presentation. Their presentation included questions and discussions with the TAC members. After their presentation, a follow-up meeting was tentatively scheduled for the last week of May, based on the attendees’ schedules. This future meeting will solely focus on the IMT Simulation Project.

# Discussion

The first topic of discussion was the results of IMT Phase III. After Dr. Schultz shared the project’s background information, Joel presented the team’s findings from the 2018 and 2022 incident data. He focused on the statistical analysis used to demonstrate the relationships between variables in his study, such as the relationship between response time (RT) and roadway clearance time (RCT). He also compared the overall results of 2018 and 2022 using total excess travel time (ETT) and total excess user cost (ECU) as comparison variables.

Joel found that average response times for emergency incidents improved over the four-year study, with 62% of incidents responded to within 15 minutes in 2022. He found that average roadway clearance times increased slightly from 2018 to 2022. There was also a relationship between incident type and clearance time, with fatal incidents having the longest clearance times and property damage-only incidents having the shortest roadway clearance time on average.

During Joel’s discussion of incident clearance times, Roger Frantz noted that after 2020, IMTs started waiting with individuals until their tow truck arrived, which could account for the changes in incident clearance time (ICT) from 2018 to 2022. Waiting for tow trucks to arrive was less common in 2018.

Joel summarized his findings, stating that excess travel time (ETT) decreased in 2022 compared to 2018. He also noted that the IMT program could respond to more crashes and larger crashes in 2022 without being resource-constrained, resulting in significantly reduced impacts on drivers.

After Joel and Dr. Shultz’s presentation, the TAC was presented with the work of the IMT Simulation Project team. Dr. Macfarlane introduced the project schedule, stating that his team is finishing developing the model and will be in Stage 4 (Analysis of Scenarios) of the project schedule by the next TAC meeting in May. Daniel then described how incidents are generated in the simulation model, and Brynn discussed the model’s vehicle dispatch methods.

Daniel and Brynn asked about IMT’s current dispatch system, and Roger explained that vehicles were assigned based on distance and availability. He also mentioned that multiple vehicles were sent based on the severity of the incident or after the first vehicle’s arrival. Roger added that IMTs could generally travel at 25 mph through congested roads.

The team then discussed how IMTs impact the network. Daniel explained that when an IMT arrives at an incident in the simulation, it can decrease roadway clearance time, improve roadway capacity, or both. Brynn provided additional information, and the TAC discussed the pros and cons of each approach.

The discussion found that linking roadway clearance time to the modeled vehicle response time could work. Still, it might be too simplistic, while improving roadway capacity upon IMT arrival could be more beneficial but challenging. The team assumes that each IMT helps restore a portion of the network capacity upon arrival and continues until the roadway is cleared. Still, no data shows the impact of each IMT’s arrival on capacity. Further investigation is needed to determine the IMT’s impact within the model.

Dr. Macfarlane, Brynn, and Daniel will continue to work on finding an effective way to model how IMTs impact incidents upon arrival. They plan to have scenarios ready for analysis and presentation in May.

# Follow Up

A future meeting is tentatively planned for the last week in May 2023 or the first week in June 2023.