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# **The Push for Interoperability** What it means for the industry

IMSA

Looking back at the 2023 IMSA Forum & Expo

# being the push to freely share MBs.

echnology is in control of our lives. It runs our phones, watches and the coffee maker. Specific to the traffic safety industry, technology is in control of our traffic signals. The cars at these signals are essentially computers on wheels, and they are getting smarter every day.

As a result, the traffic safety systems need to be just as smart as the cars. These smart-systems need to communicate with each other. That's where management information bases (MIBs) come into play by providing a common language for systems to be interoperable. For the technology novice, think of MIBs as a dictionary of objects that allow devices from different manufacturers to communicate.

These directions are currently a topic of discussion in the industry and were a featured panel discussion at the 2023 IMSA Forum & Expo held in Reno in June. Representatives

from Q-Free, Yunex Traffic, Cubic, Oriux, Econolite and SWARCO McCain participated in the standing-room-only discussion.

"There are six major competitors for traffic signal controllers in the North American market. For all six to sit together on a panel and talk about safety, security and interoperability is a pivotal moment for our industry, and that's so encouraging to me," Trisha Tunilla said. Tunilla is Executive Vice President of Marketing at Q-Free and helped to moderate the panel. She is also the #FREEtheMIBS Advisory Board Chair.

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## What are MIBs?

Like all technology that first comes out, there are many different proprietary systems. The same is true when it comes to software for traffic control systems. Think of the old Apple Macintosh vs. Microsoft Windows battle in the early days of personal computing. Today, you can have apps that allow you to run programs across both.

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This same issue exists within the traffic control systems industry. Many different systems are running in cities across the country. To address this, the National Transportation Trisha Tunilla, Executive Vice President of Marketing at Q-Free and #FREEtheMIBS Advisory Board Chair.



Communications for Intelligent Transportation Systems Protocol (NTCIP) was created in the mid-1990s to set standards for the rules of communicating and vocabulary. This allows traffic control systems built by different manufacturers to operate with one another as a system. The idea is that NTCIP standards will reduce reliance on specific equipment vendors and customized software. "NTCIP standards define standard MIBs for a variety of ITS devices, including traffic signal controllers," said Tunilla. "Having this common 'dictionary' allows devices speaking different languages to communicate. It's kind of like each vendor has their own secret recipe for good signal timing and MIBs are the variables that go into that equation. Sharing MIBs is like sharing the fact that you are measuring using feet (rather than inches, miles, meters, furlongs, or arshin). It's not sharing your secret sauce equations."

MIBs define all the values that can be programmed or reported in traffic signals and other devices within the intelligent transportation system.

# **Opening Up Access**

At the time of its development, NTCIP encouraged interoperability through MIBs. However, technology advances much faster than a system of guidelines can be implemented. As a result, companies developed their manufacturer-specific MIBs. Roughly 20% of traffic signal controller MIBs are defined by the NTCIP standard. That leaves around 80% manufacturer specific. It's that 80% of MIBs the movement for interoperability is looking to unlock.





To make this happen, the #FREEtheMIBS campaign was launched in 2019 to encourage vendors to share their manufacturer-specific MIBs more openly. The campaign's advisory board is made up of a broad range of ITS industry professionals. Q-Free was the first in the industry to do this.

"We wanted to bring together agencies, consultants and academia and give them a unified voice to advocate for interoperability," Tunilla said.

Initially, this movement was met with pushback from other companies. Tunilla said to think about this more like a marathon than a sprint. Had this been a sprint and all companies were on board, it would have been done 20 years ago. They focus on education, open dialogue and discourse. This is welcome as it helps identify points that have yet to be raised and to help dispel misinformation.

"If people hadn't raised these concerns, if they hadn't said, 'Well, what about security? What about liability issues?' we wouldn't have continued this debate." she said. "We would not have been able to realize how much we actually agree upon and then come together and discuss those things."

The goal is to foster interoperability and open innovation while creating free-market competition within the industry, leading to more value-driven, efficient solutions. Three of the six major North American manufacturers were on board within two years of starting the campaign.

"We're talking about signal technicians who should be able to choose what they want to work with," Tunilla said. "If they like the local controller software from one manufacturer and the central management system from another, why wouldn't we make it easier for our techs out in the field? This is critical to enabling that freedom of choice."

# **Best Practices**

Through the years since the start of the campaign, the debate about the fate of MIBs has generated a good amount of discussions. Much of it is positive. But there has been some negative. Again, pointing to misinformation about what opening up MIBs and interoperability will mean for the industry.

As with anything new, sharing MIBs evolves daily. There are constant discussions to develop best practices and address industry concerns. One area that is frequently brought up has to do with security. The NTCIP standards use of Simple Network Management Protocol (SNMP) is a related but separate topic from MIB sharing.



"The standards rely on SNMP v1, which doesn't have encryption. We need to push forward to SNMP v3, which provides meaningful cryptographic security," Tunilla added. "Or maybe explore alternate communication options, such as HTTPS and signed certificates, things our banking communities, for instance, are using. We should be leveraging those sorts of industry best practices. And I think the industry as a whole wants to move in that direction."

Another area companies have to keep in mind when sharing MIBs is the cost – as one vendor put it during the panel



Panel discussion about interoperability at the 2023 IMSA Forum & Expo.

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### What to know about interoperability:

- NTCIP is the first set of standards for the transportation industry that allows traffic control systems to be built using a "mix and match" approach with equipment from different manufacturers. (https://www.ntcip.org/about/)
- NTCIP standards rely on MIBs to define the common language to enable this integration
- NTCIP standards exist for a variety of ITS devices, including signs, traffic signal controllers, etc.
- NTCIP 1202 is the primary standard used for traffic signal controllers
- Pro: Sharing MIBs enables interoperability between devices from different manufacturers; it promotes innovation; is necessary to realize the vision of a truly connected world
- Challenges: 20% or less of the MIBs in a traffic signal controller are covered by the standard MIBs
- Misnomer: Sharing MIBs does not mean sharing a company's secret sauce, nor does it make systems inherently more insecure than it is today

discussion, freeing the MIBS is not necessarily free support to integrate a MIB. Agencies and vendors focused on device integration must understand how all devices on the system work, which oft involves training and testing. Also, there is keeping up with compliance, capabilities, updates, support and liabilities.

To help address these areas, NEMA and all six major traffic signal controller manufacturers are jointly developing a set of best practices to help the industry. They are constantly adjusting and focusing on requirements and responsibilities. These include understanding legal issues and rights, the data, and other services using the controllers. The overall goal is to provide one voice.

"If you're in a vehicle and you are driving from one city to another or one state to another, it's beneficial that we share data within the region," Tunilla said. "It's got to communicate with other regions to make that data shareable. That won't happen if the devices aren't communicating together."

This will be an ongoing discussion as more companies join or continue to engage with the concept of sharing MIBs. For Tunilla, she says that while unlocking the industry to more significant innovation is essential, all the manufacturers are in this business to ensure our community roads are safe.

"We all have the same goal, which is the safety and sustainability of our intersections," Tunilla said. "So, it was so powerful to come together on that."