

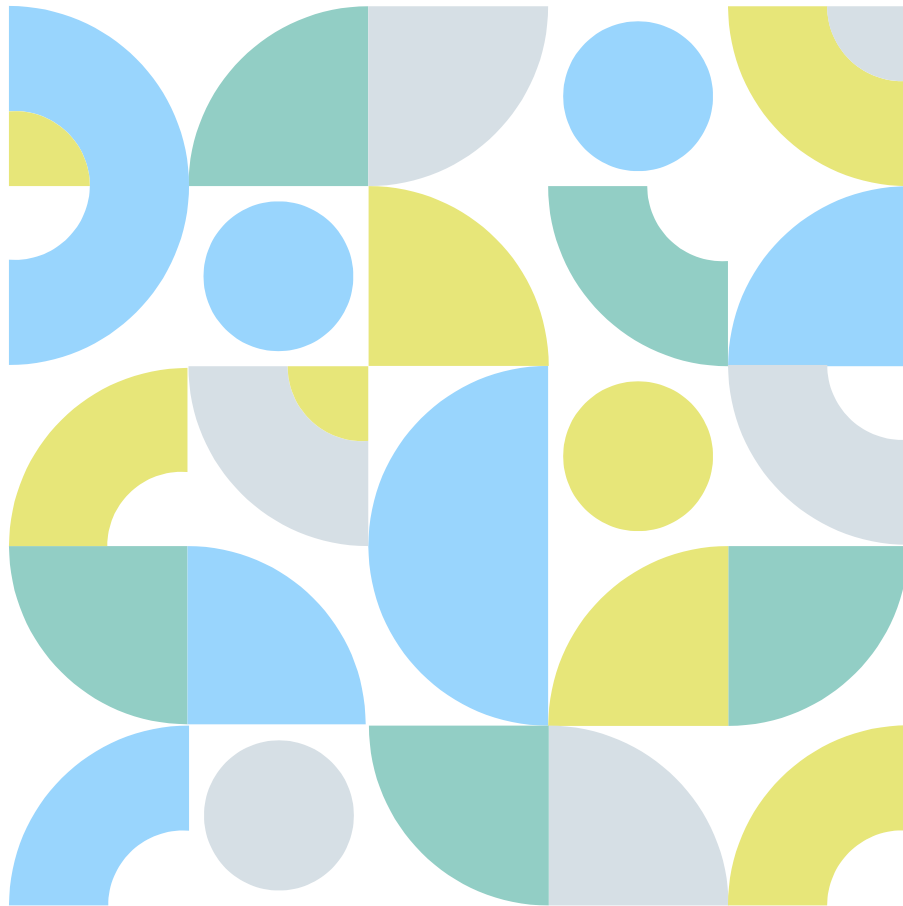


The Future of Pupil Transportation based on the Past and Present

MSBO Annual Conference

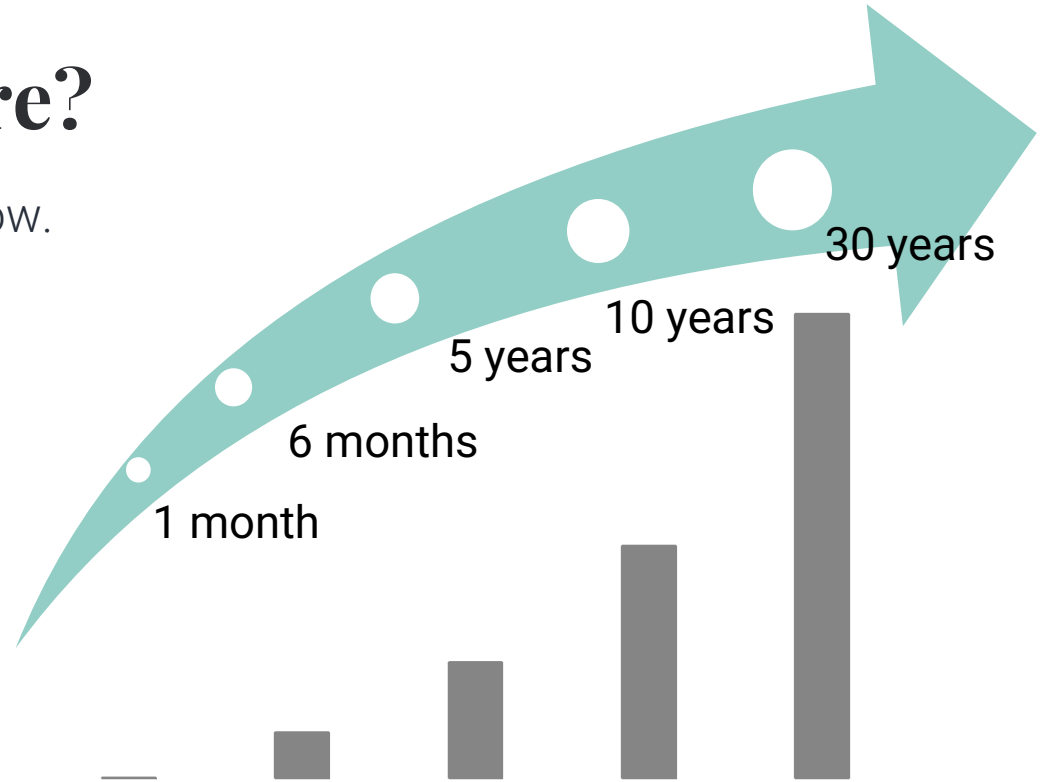
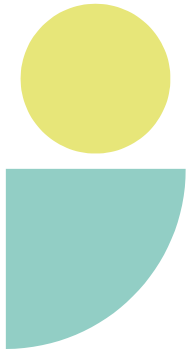
April 2023

Tim Ammon, CORM, CSRSM



When is the future?

The future starts from right now.
So, how much future are we
talking about?



How much change can you expect?

Why does any of this matter?

- Service expectations need some connection to service capabilities
- Long-term capital investment requirements require some understanding of the arc of the future
- Revolution inside evolution is very disruptive; disruption is generally not the desired state



The Ghost of Transportation Past

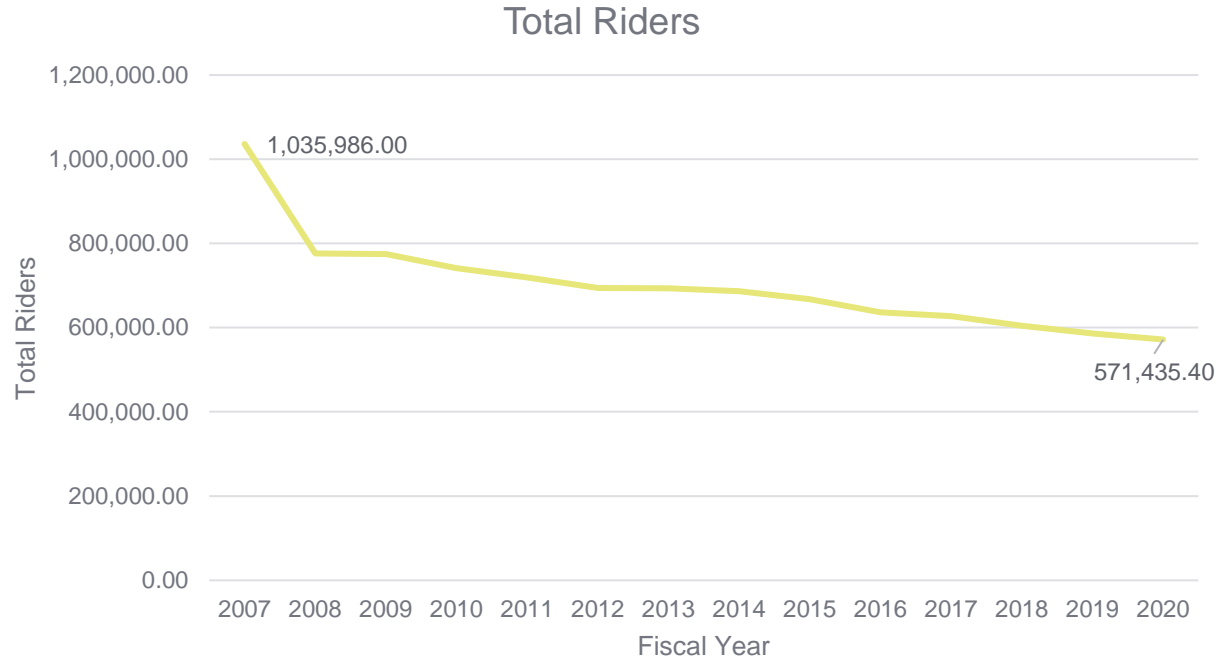
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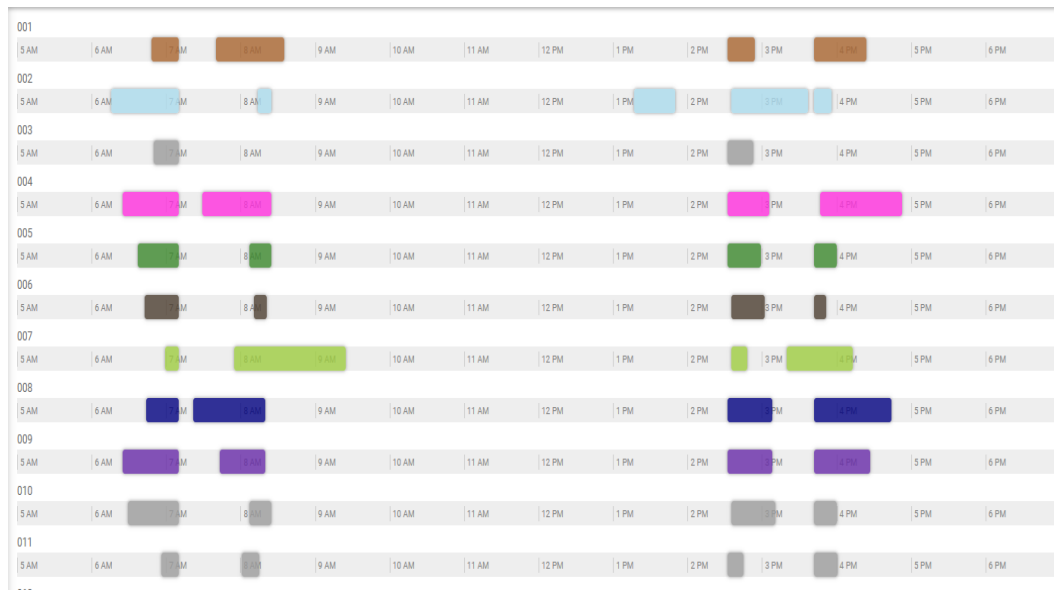
I Ain't Going Nowhere!!



Trends are clear



Managing changes in demand without changes in funding



Need to reuse buses

→ Increased complexity with increased use

↓ Increased need to know where vehicles are actually located

↓ Increased expectations for real-time communications

The Ghost of Transportation Present

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Still note enough....

**SCHOOL BUS DRIVER
JOB FAIR**
Friday, May 13, 2016

NOW HIRING!



10:00 am - 3:00 pm
Macomb Intermediate School District
44001 Garfield Road, Clinton Twp, MI



The Coming Crisis



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It's Electric!



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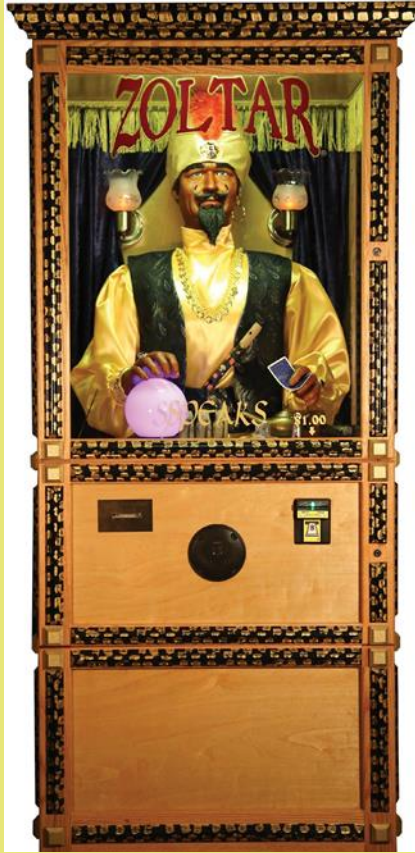
Charging Stations: The brains of the operation

When and how much to charge is critical to maximizing the use and value of any electric bus. Managing the charge is complicated and complex.



- Charge type (AC/DC)
- Charger size
- Charge timing (peak rate charging can be a surprise)
- Number of charging stations
- Placement/location of charging stations
- Data management and ownership of charging information
- V2G funding/financing/availability

The Ghost of Transportation Future

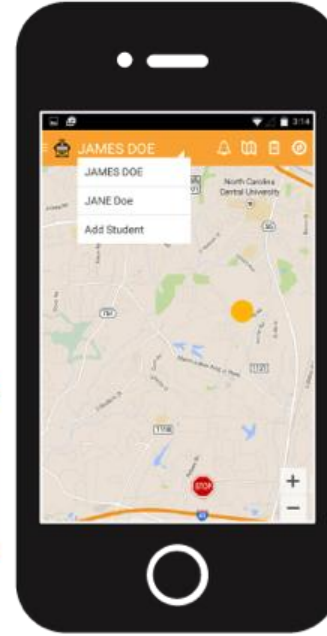


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V2G, V2X, and other letters



Driver Support



The Rolling Classroom

- The pandemic showed the value of distributed wifi via school buses
- Concern about long bus rides and access in rural areas continue to serve as use cases
- Behavior management is anecdotally easier which is a leading concern in bus driver retention



Log on to School Bus Wi-Fi

A free network for K-12 students

A school bus 'hot spot' will be parked at

SWAG Community Center / Linton Oaks
807 SW 64 Terrace, Gainesville

Mondays through Fridays from 9 a.m.-12 noon

Network name is *school bus wifi*. No password is required.

You must be within 150 to 200 feet of the bus. NO ENTRY is permitted on the bus. Please maintain social distancing while using this service.

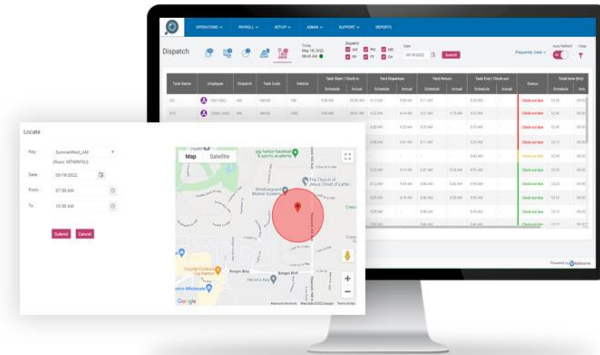
This network is for K-12 students doing schoolwork ONLY. Please DO NOT use for other purposes.

*Sites and times may be adjusted depending on usage. Visit www.sbac.edu for more information.



Dispatch: The Valley between plan and actual

- The only area where all areas collide
- Despite the obvious connection between the two, the industry has had limited dispatching tools
- Demand-response requirements and driver shortage has dramatically increased the need for this technology
- Significant need for increase in capabilities of staff to leverage these tools



The Influence of Unknown

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Why will the future come....but slowly!

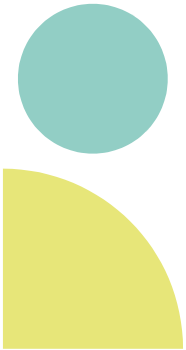


Structure

- Many of the existing contract structures will last beyond 2030
- Many of the existing assets in place will last beyond 2030
- Many of the existing educational systems cannot or will not change quickly

Proportionality

- Transportation is a big deal to us; less than a majority of students use the service
- Big changes to small things will still result in small changes...but they are cumulative
- Big changes within transportation will not all happen at the same time; cycle times are long





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