

# MICHIGAN'S ACCELERATED RAIL PROGRAM

- Elements of Infrastructure Improvements
  - Track structure
  - Bridges
  - Stations
  - Train Control System
  - Grade Crossings
  - Equipment



# MICHIGAN'S ACCELERATED RAIL PROGRAM

## Track structure

You build track the same no matter the speed, the tolerances change

Speed and weight/carloads impact performance of the Track structure, requiring more robust material. The track structure is steel rail on steel tie plates over wood, steel, composite or concrete ties, with stone ballast on sub-ballast on native soil

- **Rail**
  - Heavier sections measure in pounds per yards, 132-136 are common
  - Web is taller & thicker
  - Base wider & bigger head
- Tie plate matches the rail section getting thicker as weight goes up
- Cross tie space narrows material change for longevity
- Ballast hardness increases, the depth between tie and sub-ballast increases and shoulders





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**You are increasing the ability to carry loads at higher speed and lengthens the maintenance cycle to control cost.**

- **For class 1 track you can drive along in the hyrail truck and find places that need work**
- **Class VI and above there are inspections coaches recording the horizontal and vertical profile & many other points that are analyzed at track speed**
  - **Marks the track location because you can no longer determine with defects by eye.**



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## Bridges

- Bridges are like track - add some anti vibration technology to damp speed impacts
- Increased loading due to speed

## Geometrics

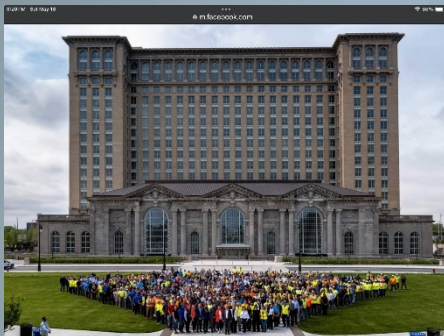
- Vertical grades are impacted as much, as horizontal curves. The flatter the grade the better so the energy use is lower
- Horizontal curves are much smoother or larger radius and the transition spirals between tangent and curve becomes longer. Building on an existing right of way can be difficult.
- Throws track out of existing ballast section and sometimes ROW



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## Station

- **Good Spacing**
  - Would not add anymore
- **Most part good facilities**
  - Newest - Pontiac, Troy/Birmingham, Dearborn, New Buffalo
  - Renovated - Niles, Dowagiac, Kalamazoo, Battle Creek
  - Need help - Royal Oak, Detroit, Ann Arbor, Jackson, Albion





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## Train Control System

- In MI we have an Incremental Train Control System (ITCS) developed by General Electric Transportation Systems (GETS) through a series of acquisitions.
- This system is vital, the train control system doesn't limit train speeds, being used in China at up to 240 MPH.
- Federally mandate for Positive Train Control (PTC) doesn't require the system to be vital limited 90 MPH maximum speed.
- With the full commissioning of ITCS in 2012, MI became the first place not connected to the Northeast Corridor to have passenger train speeds up to 110 MPH. Illinois increased speeds to 110 MPH in 2023. On the Chicago St Louis line they used the grade crossing warning devise system developed in MI.





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## Train Control System –continued

- MI & IL were awarded the first federal grants for communication-based train control system development in 1996. Why did it take so long money.
- During the late 90s and early 2000s we had people from around the globe coming to southwest MI to see the system we were developing.
- The system was developing using GPS for location determination. At that time the DOD didn't allow non-military applications access to their clean signal, we introduced correction system to bring the location from a 20-meter circle to within 6 inches. Pre 9/11 the Coast Guard wasn't part of DOD so they didn't have access to the clean signal, we provided them with corrected data for the Great Lakes

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## Grade Crossings

- 25-109 MPH the focus is on protecting the vehicle occupants
- 110 MPH and above the focus shift to the train occupants
- Feds allow approved positive barriers
  - There are not federally approved positives barriers
- Eliminating grade crossings not only significantly increase cost but negatively impacts the surrounding area.

Think of the freeway visa a local road with intersections.

- Building separations in most communities would decimate the community





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## Equipment

- Equipment is the sexy part of passenger rail
- It is what the passenger sees, feels, smells, touches.
- When you fly the airplane is the important part
- It isn't the parking lot, the airport or the gate it is the plane.

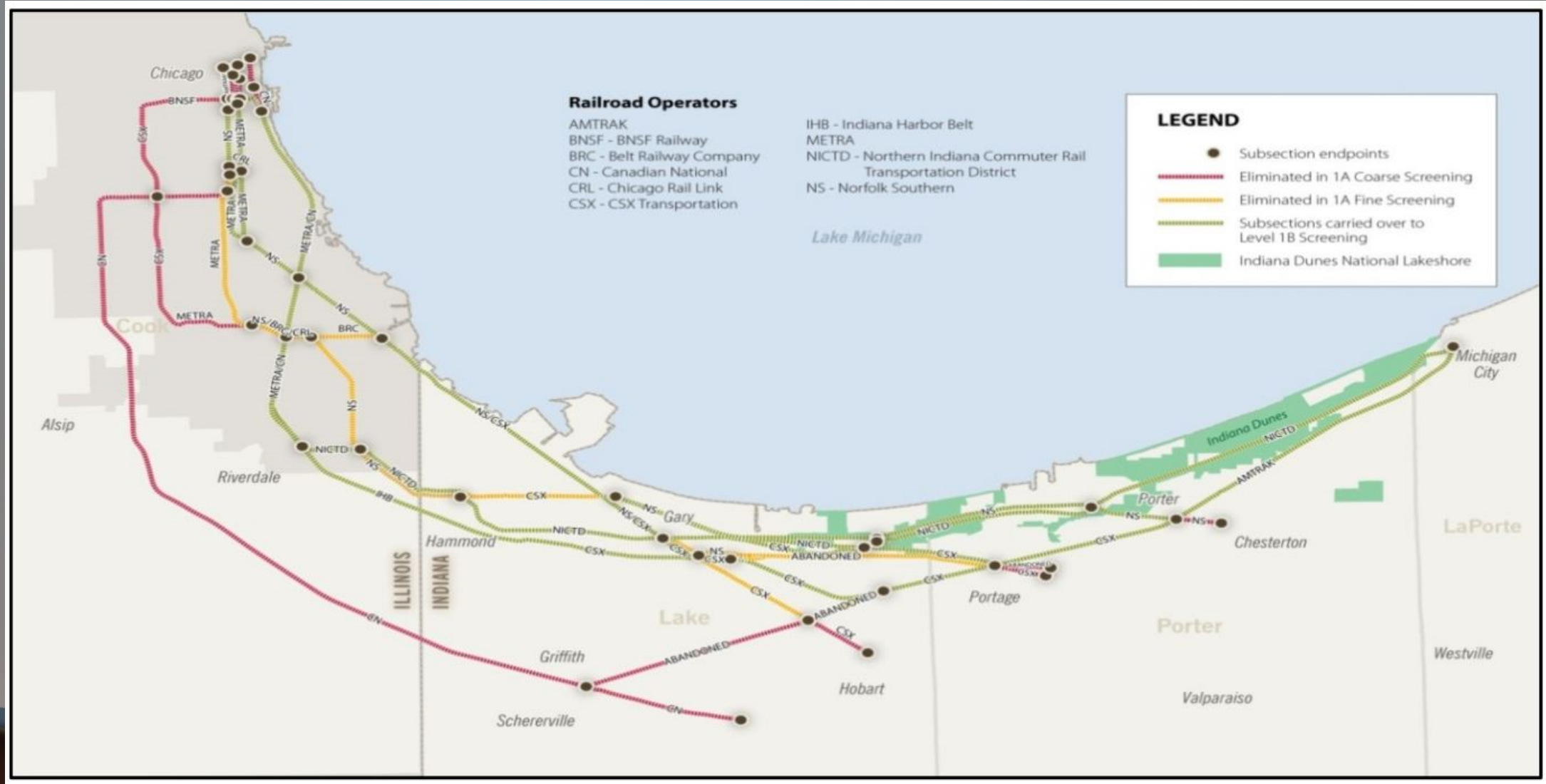


# MICHIGAN'S ACCELERATED RAIL PROGRAM

- **South of the Lake CUS to Porter**
  - **Illinois & Indiana**
  - **One of the most congested segments of railroad in the US**
  - **Dedicated passenger alignment**
  - **Will cost \$Billions**
  - **Most important to Michigan & Amtrak**
  - **Amtrak has higher priorities**
  - **Not so much IL & IN**
  - **Limiting Michigan services to grow – add Frequencies**



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# **MICHIGAN'S ACCELERATED RAIL PROGRAM**

## **Service to Canada**

- **International run between Toronto and Chicago through MI**
  - **Port Huron - Lapeer – Flint – East Lansing – Battle Creek – Kalamazoo – Niles**
  - **Run from the 1982 to April 2003**
  - **Now the Bluewater between Port Huron and Chicago**
- **Hope to restart international services via the Detroit Windsor gateway sometime in the future**



# **MICHIGAN'S ACCELERATED RAIL PROGRAM**

**QUESTIONS  
Or  
Comments**



# MICHIGAN'S ACCELERATED RAIL PROGRAM

**Thanks for listening  
to the  
musings of an old guy!**

