

Future of the Interstate - A Systems Operations Perspective from Iowa



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Setting the Stage

- Comments representative of Midwest/Rural states
- Past/Now/Near Future (2030-2040)/Far Future (2040 +)
- Systems Operations Perspective:
 - Safety
 - Mobility
 - Efficiency
 - Economic Development

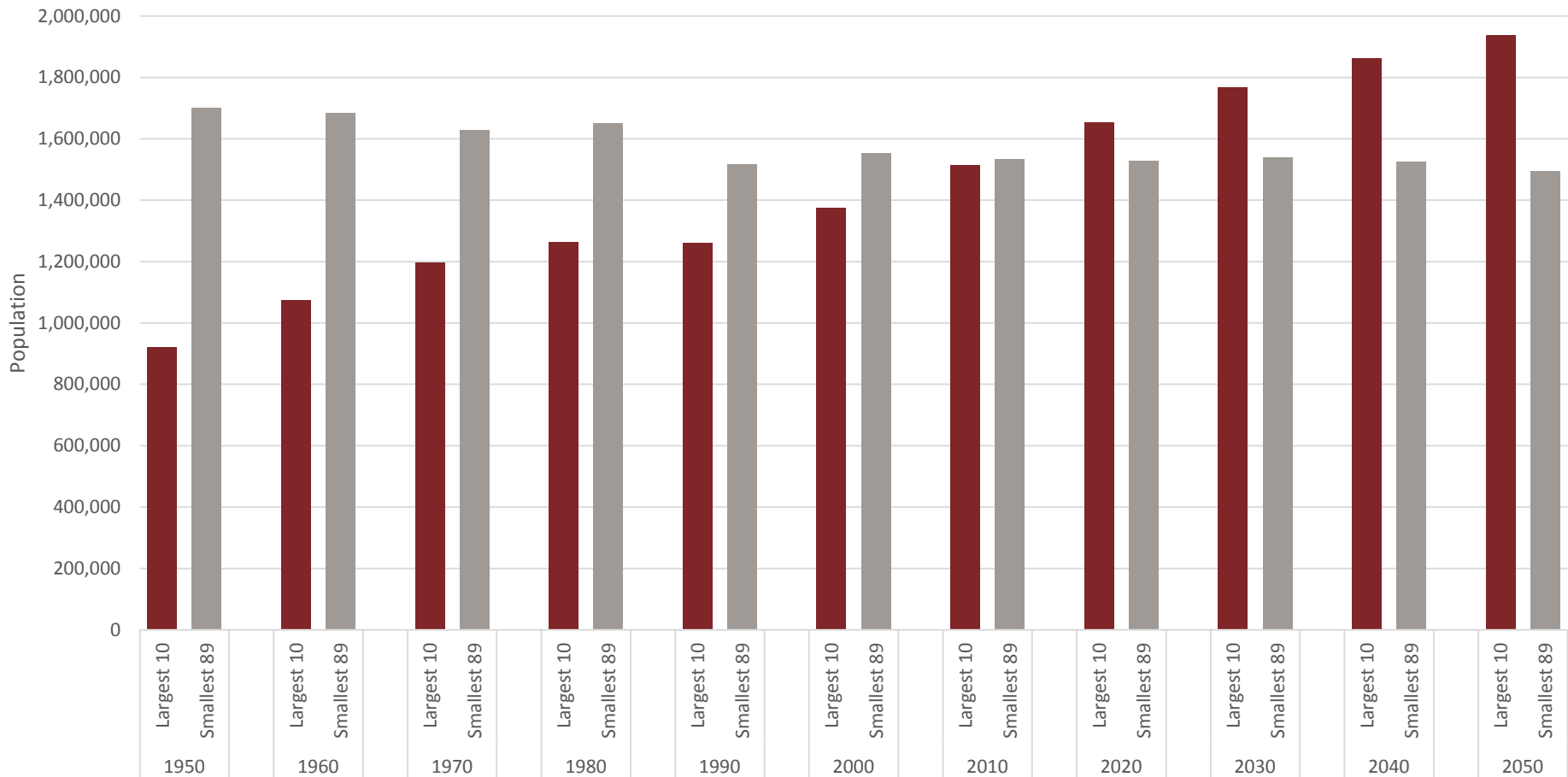
Groups Contacted

- Internal Iowa DOT divisions and offices
- Iowa Economic Development Authority
- Automated Vehicle project vendor (HERE of North America)
- Retired Iowa DOT staff
- Iowa Motor Truck Association
- Iowa National Guard
- Iowa universities

Discussions

- Imagining what life and the interstates in Iowa will be like over the next 50 years is very difficult for most people to even contemplate
- Looking back 3 years, Automated Vehicles (AV) wouldn't have been part of the conversations, and every group brought up the impact from AV

Historical and Forecast Iowa Population - Largest 10 Counties vs. Smallest 89 Counties, 1950-2050



Data sources: U.S. Census (1950-2010); Woods & Poole Inc. (2020-2050 projections)

Iowa's Interstates - Past

- 50 years ago – I went for a ride.....
- Original purpose of the Interstate:
 - Safety
 - Mobility
 - Efficiency for civilians and military
 - Economic Development

Iowa's Interstates - Past



Iowa - Past

- Agricultural (Ag) based economy
- Strong rural and “smaller urban” focus
- “Field of Dreams” life



Iowa's Interstates - Now



Iowa's Interstates – Now

Systems Operations Perspective

- Safety
 - Zero Fatalities Program
 - 27% increase in state traffic fatalities from 2015 to 2016 (from 320 to 404)
 - Iowa's Automated Vehicle (AV) project, interstate focus
- Mobility –Transportation Systems Management and Operations (TSMO) implementation
- Efficiency focus for freight and cars (not military)
- Economic Development for Ag and manufacturing



Iowa - Now

- “Producer state”
- “Field of Dreams” life in rural/some suburban areas



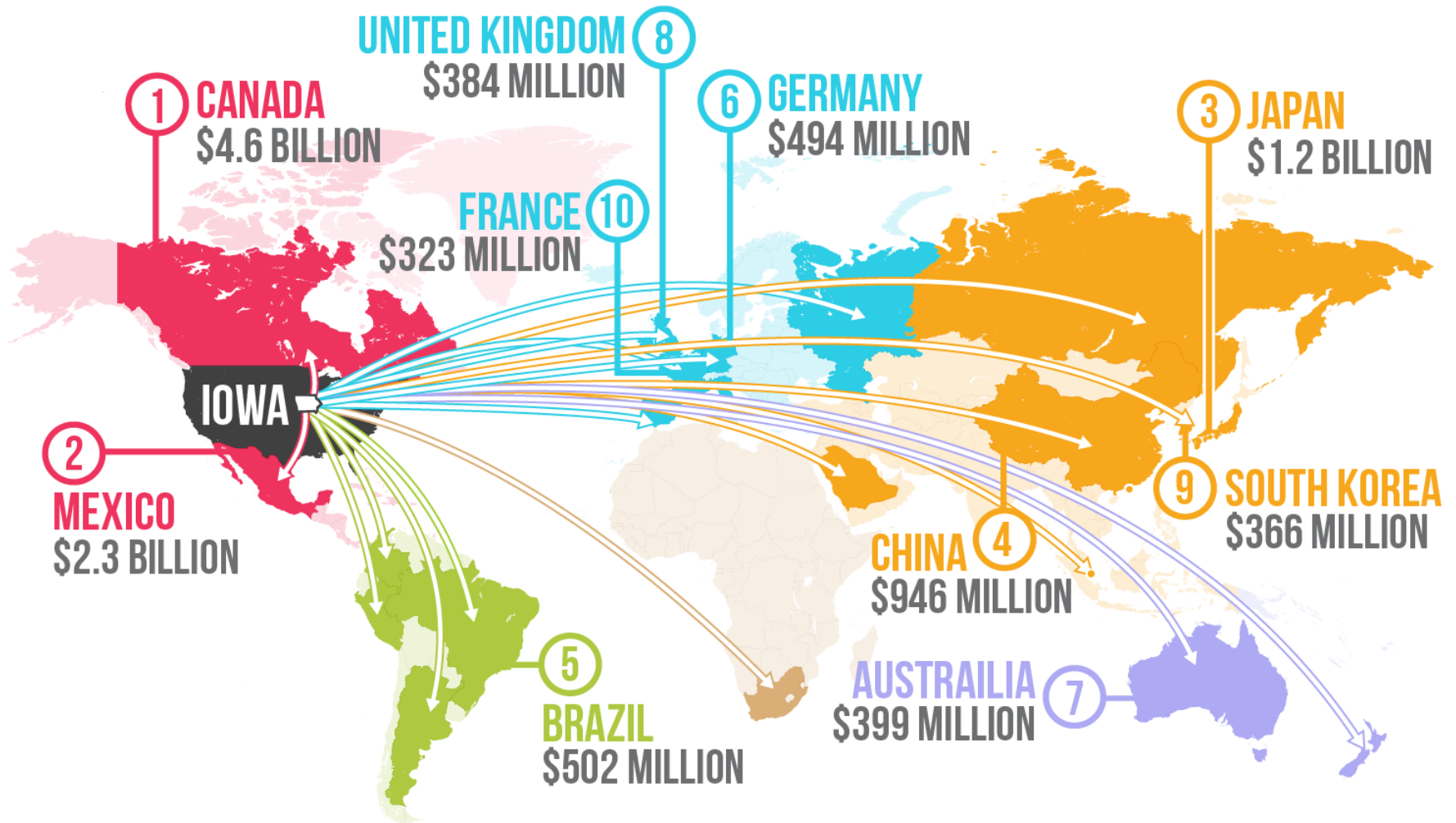
Iowa Now

Producer state

- \$14.6 Billion in manufactured and value-added goods
- Manufactured exports grew 20% from 2008 to 2012
- 95% of Iowa products go to other countries

2014 ANNUAL VALUE OF IOWA EXPORTS TO TOP 10 COUNTRIES

SHADED COUNTRIES REPRESENT TOP 25



Iowa's Interstates - Now

- Current freight commodities
 - Corn, hogs, eggs - #1; Soybeans - #2; 92% of the land is farmland
 - Growing manufacturing – 3X more revenue than ag commodities
- Study of freight transportation network optimization

https://iowadot.gov/systems_planning/pdf/Development-of-Iowa-Statewide-Freight-Network-Optimization-Strategy.pdf

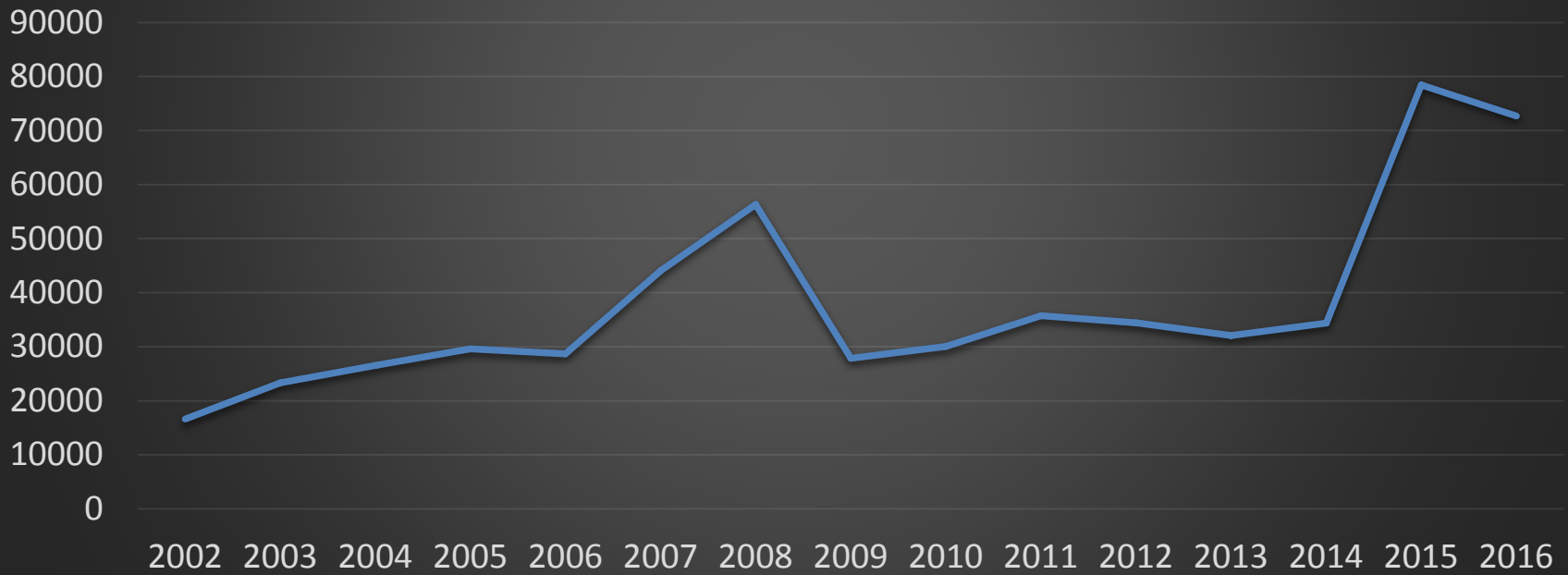
Iowa's Interstates Truck Volume Now (2011)



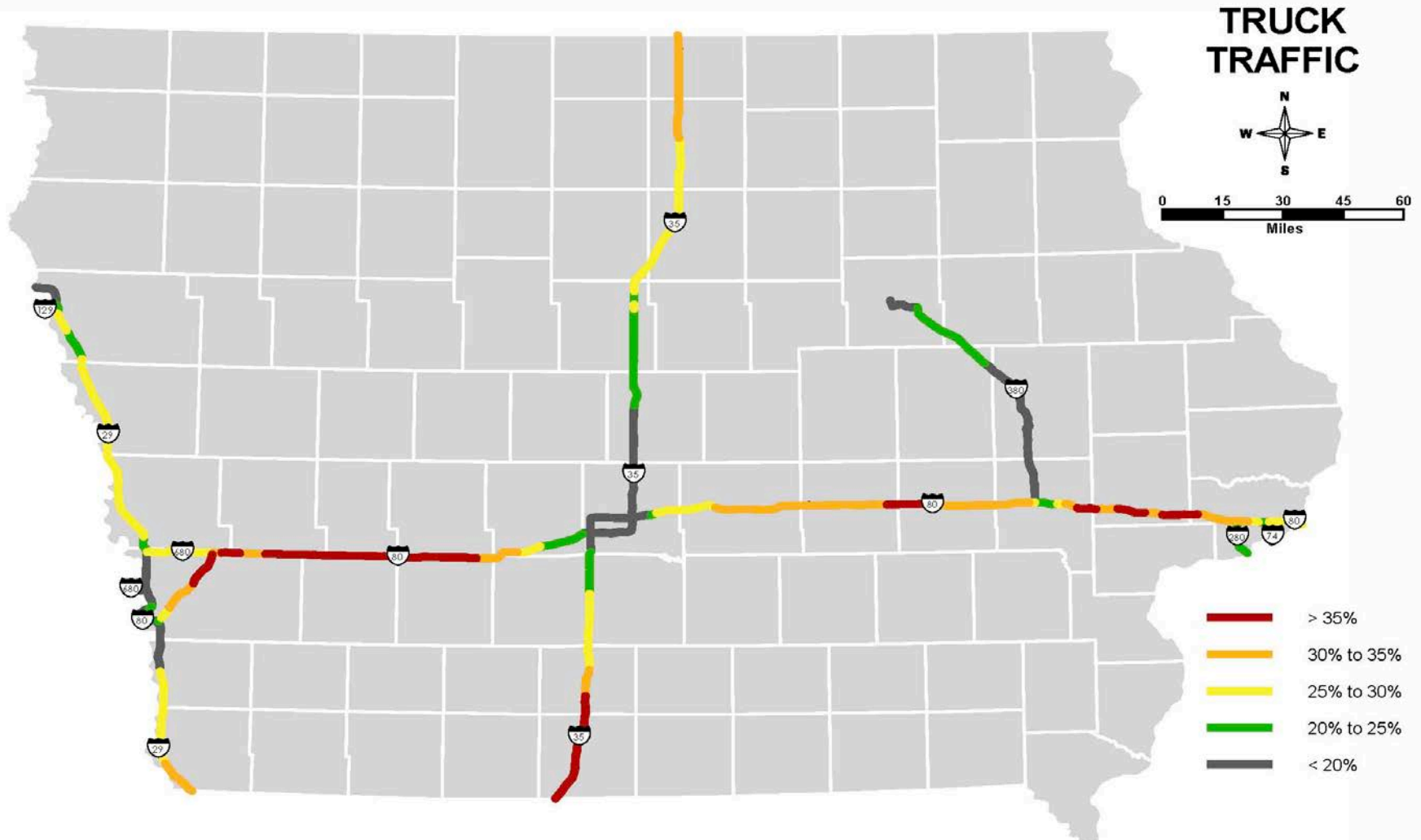
Interstate Highways in Iowa

- 782 miles of Interstate - out of 114,876 total roadway miles
- Interstates make up ~8% of primary highways
- Carry over 60% of statewide large truck traffic
- Truck percentages approaching 40% in some interstate areas

Oversize/Overweight Interstate Permits max 78,451 in 2015



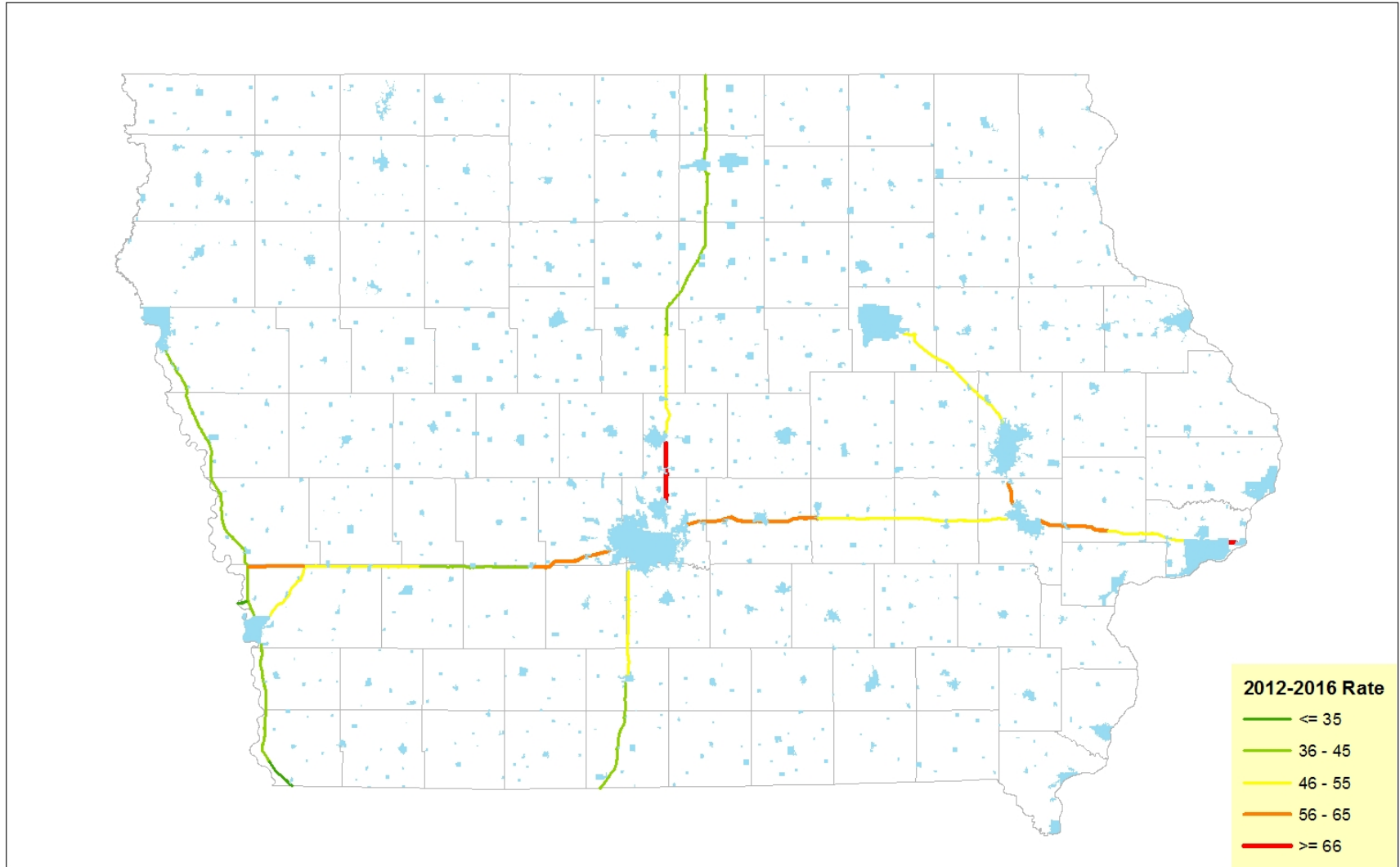
Iowa's Interstates – Now % Truck Traffic



Iowa's Interstates – Now

Total Crash Rate (HMVMT) 2012-2016

2012-2016 Total Crash Rate



Iowa's Interstates – Now

www.iowadot.gov

- Iowa in Motion - Interstate Corridor Plan (2013)
Examining safety, efficiency and quality of life (efficient travel) looking toward 2040; includes operations
- Iowa in Motion – State Freight Plan (2016)
Looking toward 2040, includes operations and AV
- Iowa in Motion 2045– Long-range transportation plan (2017), includes TSMO and AV
- “Shelley Row’s Pause Points lesson” for emerging technology added to our planning processes

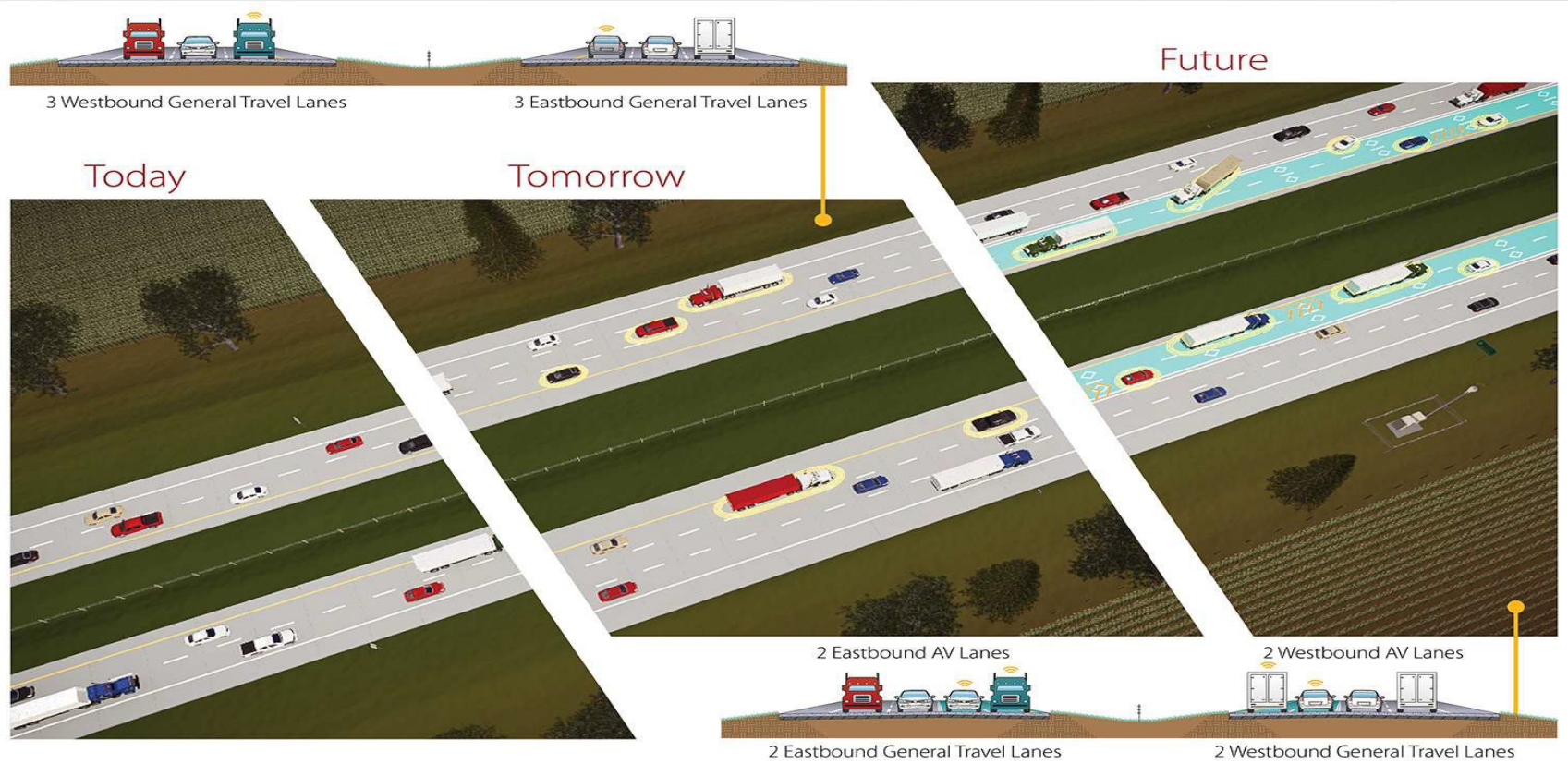
Iowa's Interstates - Now

Iowa I 80 Planning Study

- I 80 (our primary freight corridor) planning study is studying Interstate 80 in an effort to increase mobility across the interstate system
- Tech memos on operations, AV, truck only lanes, resiliency and vulnerability
- www.iowadot.gov/interstatestudy/home

Iowa's Interstates I 80 Planning Study

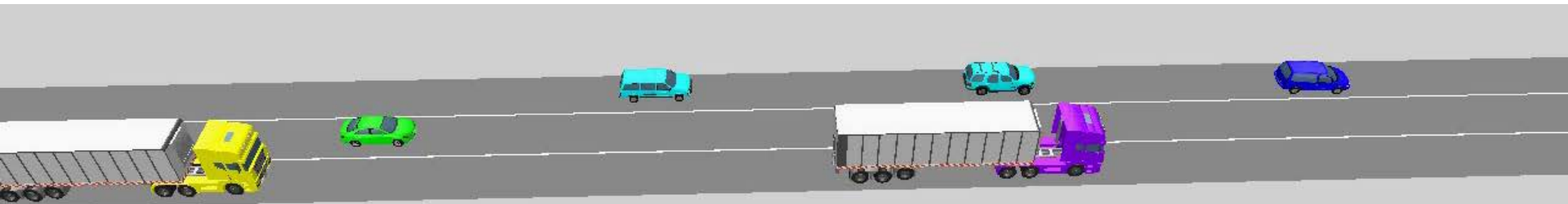
Now and Near Future



Interstate 80 Planning Study-

Automated Vehicle Simulation

Automated Vehicles in Mixed Traffic with Human Drivers



Dark Blue – AV Car

Light Blue – AV Car in platoon

Green – Manual Car

Purple – AV Truck

Yellow – Manual Truck

Iowa's Interstates – Near Future Still the focus

– Safety

- Early positive impact from AV for autos and trucks

– Mobility

- Increased travel info/data for drivers/vehicles

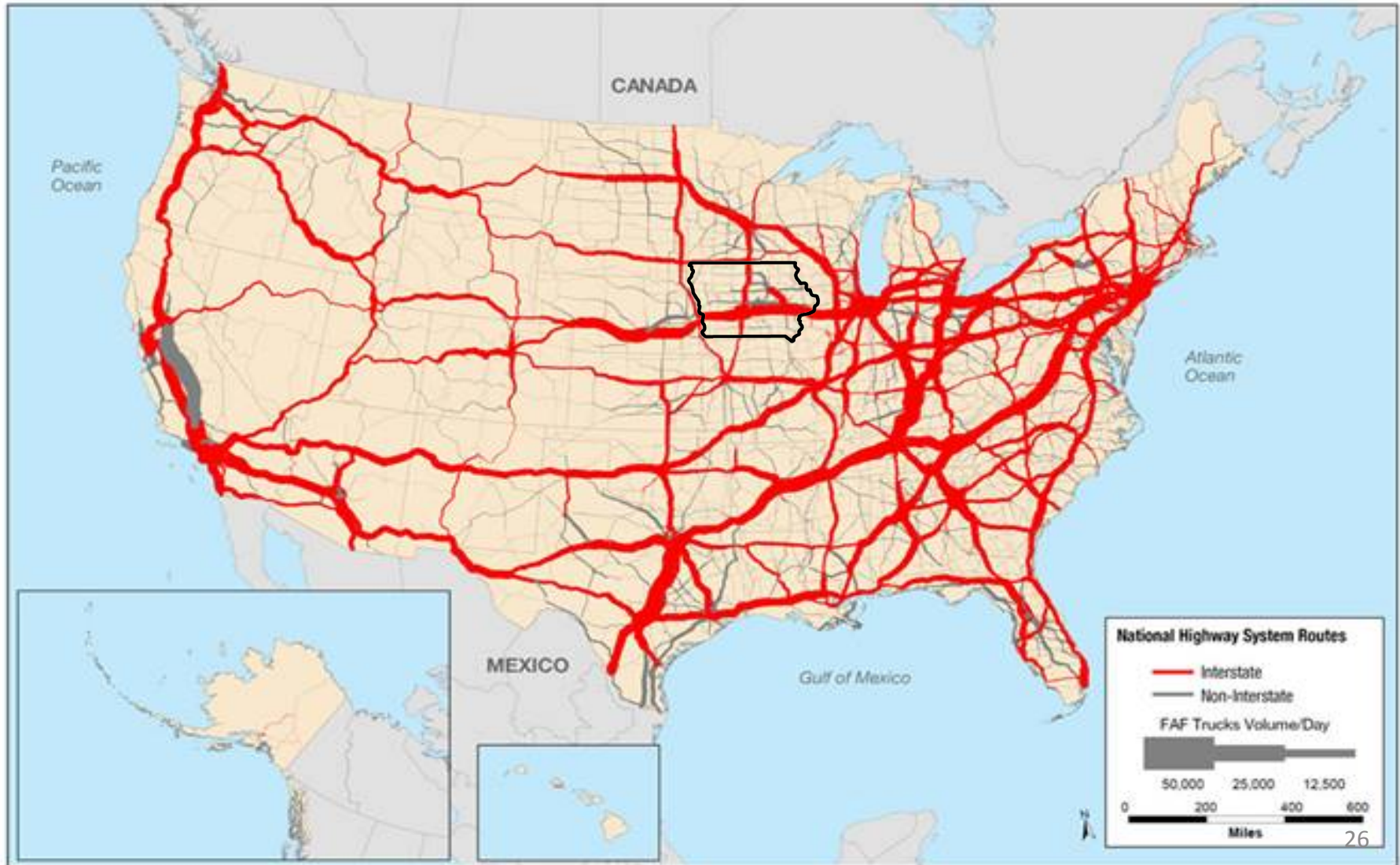
– Efficiency for all

- Integrated TSMO Program

– Economic Development

- Continuing truck freight growth
- Increased global demand for Ag products and machinery; corporate farms with higher yields

Iowa's Interstates Truck Volume Near Future (2040)



Iowa's Interstates – Near Future (2030-2040)

- Iowa total Vehicle Miles Traveled (VMT) growth percentage
 - 2014 to 2034 = 47.1%
 - 2014 to 2044 = 79.4%
- Iowa **Truck** VMT growth percentage
 - 2014 to 2034 = 47.9%
 - 2014 to 2044 = 80.7%

Iowa's Interstates – Far Future (2040+)

From HERE of North America

Iowa's Interstates – Far Future: **Designed for Freight Movement, while accommodating cars**

– Safety and Mobility

- Game changing positive impact from AV for all

– Efficiency improvements for all

- Reduce the negative effect from weather impacts, especially for freight
- Urban/rural interstate changes
- Generational changes in travel by car
- TSMO embedded

Iowa's Interstates – Far Future: **Designed for Freight Movement, while accommodating cars**

– Economic Development

- Increased global demand for Ag products
- “Field of Dreams” quality of life choices
- Freight growth
- Corporate farms/precision farming lead to higher yield

Other Food for Thought

- Look into the Foresight Series, NCHRP Report 750 Series

<http://www.trb.org/NCHRP750/ForesightReport750Series.aspx>



Exciting Times Ahead for Iowa's Interstate – Redefining our Priorities

Why? This is our life and our
livelihoods.....