

The Importance of Highways to U.S. Agriculture

APPENDIX B:

Analysis Corridor Condition, Performance, and Commodity Flow Data Visualizations

Read the full report:
<http://dx.doi.org/10.9752/TS295.12-2020>

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Analysis Corridor Condition, Performance, and Commodity Flow Data Visualizations

This appendix visualizes conditions, performance, and commodity flow data for each of the 17 analysis corridors presented in the report *The Importance of Highways to U.S. Agriculture*. The report draws from these data to inform the analysis and narratives included in Section 4: Agricultural Freight Flows and Performance.

This appendix will help readers:

- Visualize key information about the condition and performance of the 17 analysis corridors;
- Understand in greater detail how agricultural commodities move along the corridors; and
- Identify performance challenges affecting the movement of agricultural commodities along the corridors.

Approach

This report uses a novel approach to combining agricultural commodity flow, infrastructure condition, and highway performance data to analyze corridor performance for domestic agricultural freight. This appendix visualizes these data using linearly-referenced strip charts and corridor context maps which allow readers to quickly see information from multiple datasets for each location along the analysis corridors.

This approach demonstrates the potential for using highway conditions and performance data to better understand how highway infrastructure and performance affects agricultural freight movements. Transportation agencies may consider a similar approach to conduct their own corridor analyses using this appendix as an example. With the exception of the agricultural commodity data from IHS Markit's Transearch database, all datasets used are available to State Departments of Transportation from the U.S. Department of Transportation. For details about the methodology used to develop the data presented in this appendix, see Appendix C: Methodology.

How to Read these Visualizations

Data for each corridor is presented alongside a context map describing the route, mileage, major cities and urbanized areas along the corridor. Nearby agricultural processing centers and intermodal transfer locations are also included in the maps for context.

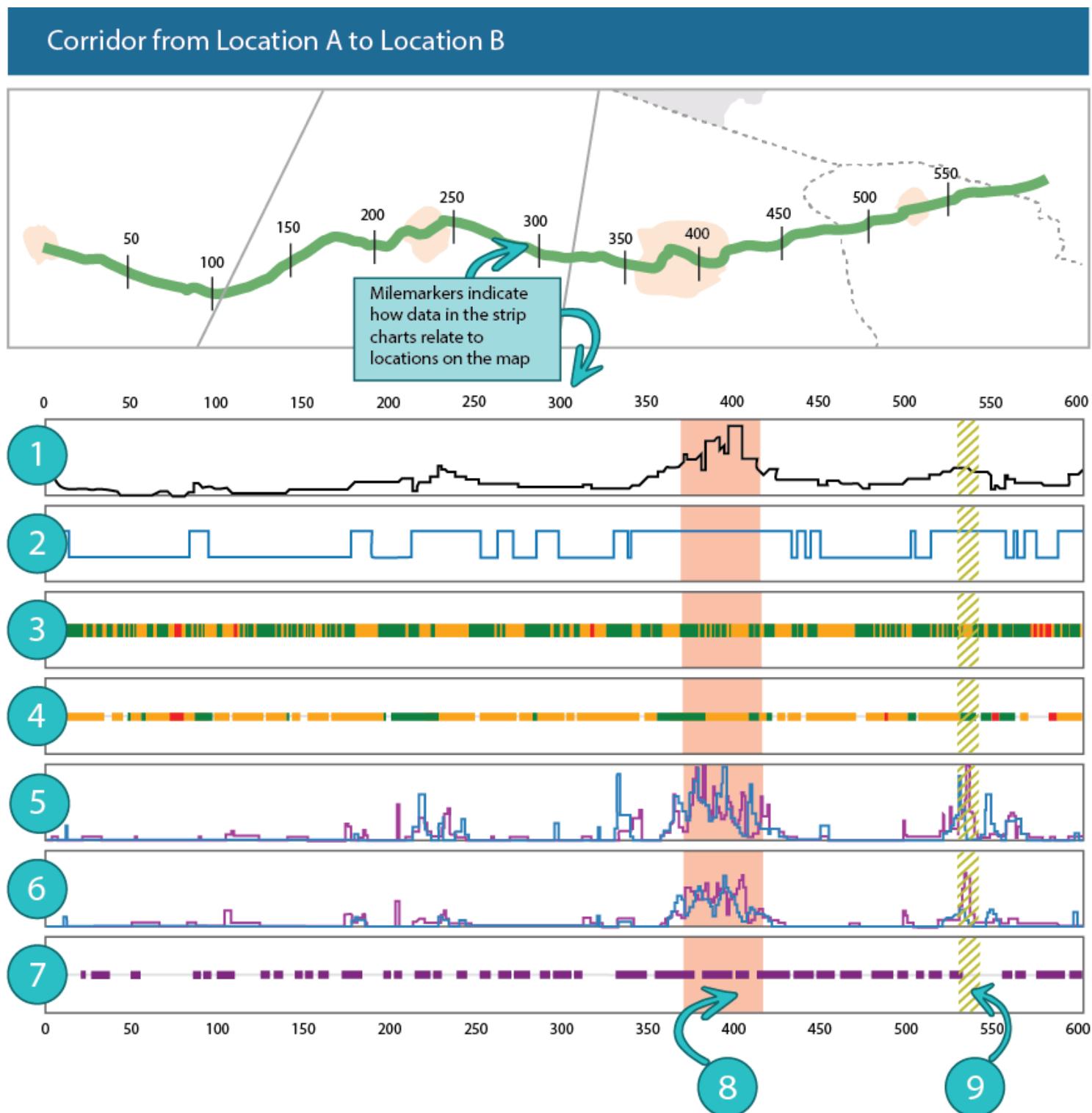
Strip charts below the context maps visualize data from various sources and are linearly-referenced to the mile markers shown in the maps. Some strip charts contain two lines of data, showing information for both directions of travel.

Conditions and Performance Data

The first page of each corridor includes strip charts showing data about the physical infrastructure conditions and performance of the corridor. Highway segments with Travel Time Index (TTI) > 1.2 or Truck Travel Time Reliability (TTTR) > 2.0 are also shown as the shaded areas across all datasets to help readers identify areas with congestion and reliability performance challenges on the agricultural commodity flow strip charts on the commodity flow data pages.

Figure 1 below shows an example visualization. See Table 1 for additional details.

Figure 1: Example of a Conditions and Performance Corridor Strip Diagram



Source: U.S. Department of Transportation, John A. Volpe National Transportation Systems Center (Volpe Center)

Table 1: Conditions and Performance Strip Chart Data Elements

Diagram Number	Label	Data	Description	Data Year	Source
1	AADT	Average Annual Daily Traffic	Average annual number of all vehicle traffic on the corridor on a daily basis, expressed in thousands of miles	2017-2018	Highway Performance Monitoring System (HPMS)
2	Urban/Rural	Urban/Rural Designation	Indicates if the segment of highway is within an urban area or rural area	2017-2018	HPMS
3	PAV. Condition	Pavement Condition (good/fair/poor)	Describes the conditions of pavement on each segment of roadway in the corridor	2017-2018	HPMS
4	Bridge Condition	Bridge Condition (good/fair/poor)	Describes the conditions of each bridge on the corridor	2018	National Bridge Inventory (NBI)
5	TTTR	Truck Travel Time Reliability	Describes the reliability of travel times on the segment for trucks (how consistent congestion levels are over time). An index value of 1 means that the 95th percentile travel time is the same as the 50th percentile travel time	2018	National Performance Monitoring Research Data System (NPMRDS)
6	TTI	Travel Time Index	Describes the ratio of peak congestion to free flow traffic where 1 is free flow traffic during peak congestion, and a higher value indicates longer travel times. For example, a TTI of 1.25 would indicate that travel time during peak congestion would take about 25% longer than in free flow traffic.	2018	NPMRDS
7	TRUCK FATAL.	Roadway fatality involving a single or double unit truck	Fatalities on the corridor that involved a truck	2014-2018	Fatal Analysis Reporting System (FARS)
8	TTTR > 2.0	Truck Travel Time Reliability Index	Highway segments experiencing among the top 3% TTTR index values among all analysis corridors (i.e., least reliable segments on analyzed)	2018	NPMRDS
9	TTI > 1.2	Travel Time Index	Highway segments experiencing among the top 3% TTI index values among all analysis corridors (i.e., most congested segments analyzed)	2018	NPMRDS

Source: Volpe Center analysis

Commodity Flow Data

The second, third, and fourth page of each corridor present 2018 data describing domestic agricultural freight tonnage, market value, and truck unit data from the IHS Markit Transearch database, for the focus commodities traveling in significant quantities across that corridor (Table 2). Highway segments with TTI > 1.2 or TTTR > 2.0 are also overlaid on agricultural commodity data strip charts to help readers identify performance challenges that affect movement of specific commodities.

Table 2: Agricultural Commodities Studied

Commodity Group	Commodity	Standard Transportation Commodity Code
Grain	Corn	01132
	Soybeans	01144
	Wheat	01137
Fruits	Apples	01221
	Strawberries	01293
	Oranges	01214
	Watermelons	01392
Vegetables	Lettuce	01335
	Dry Onions	01318
	Potatoes other than sweet	01195
Milk & Dairy Products	Dairy farm products	0142
	Processed whole milk, skim, cream or fluid products	2026
Meat Perishables	Meat, fresh or chilled	2011
	Meat, fresh-frozen	2012
	Dressed Poultry, fresh or chilled	2015
	Dressed Poultry, fresh-frozen	2016
Livestock	Livestock	0141
Poultry	Live poultry	0151

Source: Volpe Center analysis

Context Map

Each page contains a context map of the corridor. The maps are oriented so that the corridor is horizontal on the page (as opposed to north arrow facing upward) to help the reader more directly reference the strip chart data to locations on the corridor.

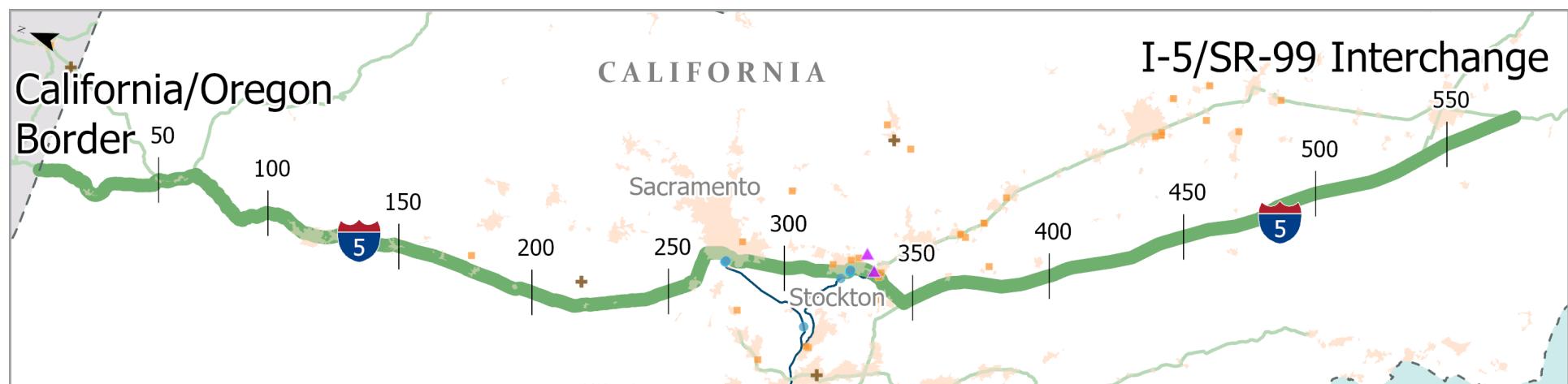
Table 3: Context Map Data Elements

Symbol	Source Dataset	Date	Dataset Name	Data Provider	Notes
▲	Rail Intermodal Facilities	2019	Intermodal Freight Facilities Rail	Bureau of Transportation Statistics (BTS)	
■	Meat Processing Facilities	2019	Listed Slaughter and Rendering Establishments	U.S. Department of Agriculture	
✚	Grain Elevators	2014	Grain Elevators	Volpe Center Analysis	Volpe Center compilation of approximate grain elevator location from publicly-available data sources in 2014
●	Ports Handling Agricultural Tonnage	2019	Ports Dataset	BTS	Dataset filtered to remove ports estimated to have low likelihood of handling agricultural goods
—	Inland Waterways	2019	Navigable Waterway Lines	BTS	
—	High-Volume Domestic Agriculture Highway (HDAH) Route	2018	n/a	Volpe Center Analysis	See main report, Section 4: Agricultural Freight Flows and Performance for additional information
—	Analysis Corridor	2018	n/a	Volpe Center Analysis	See main report, Section 4: Agricultural Freight Flows and Performance for additional information
□	Metropolitan Area	2018	U.S. Urban Areas	U.S. Census Bureau	
---	State Boundaries	2018	U.S. State Boundaries	U.S. Census Bureau	

Source: Volpe Center analysis

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Corridor #1:

CA/OR Border to I-5/State Road-99 Interchange**CONDITIONS & PERFORMANCE****DATA LEGEND****Congestion and Reliability****Bridge and Pavement (PVMT) Condition**

"Good" Condition

"Fair" Condition

"Poor" Condition

Traffic Direction (TTTR/TTI)

OR/CA Border to I-5/SR-99

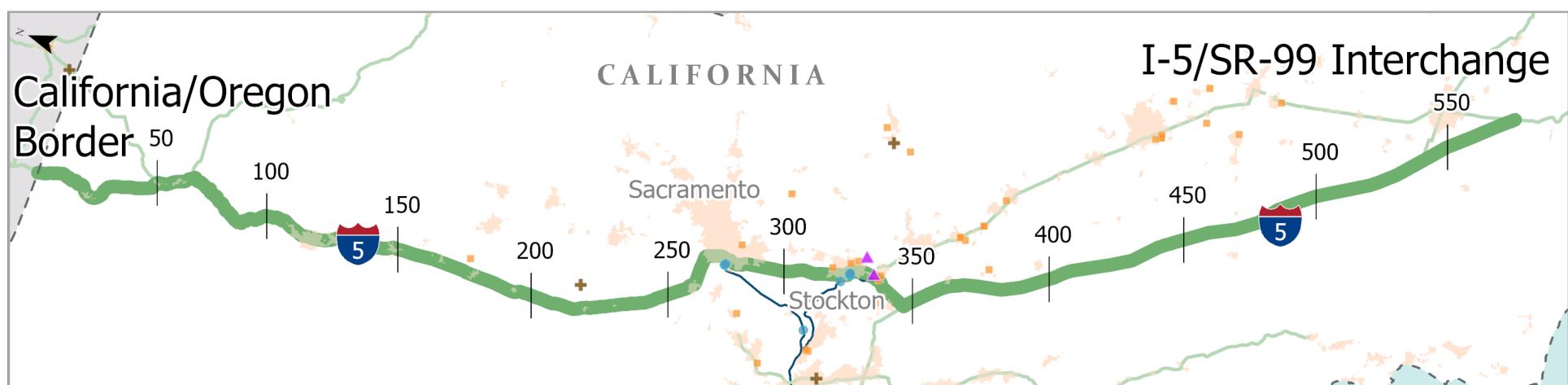
I-5/SR-99 to OR/CA Border

Safety

1 fatality involving a truck, 2014 - 2018

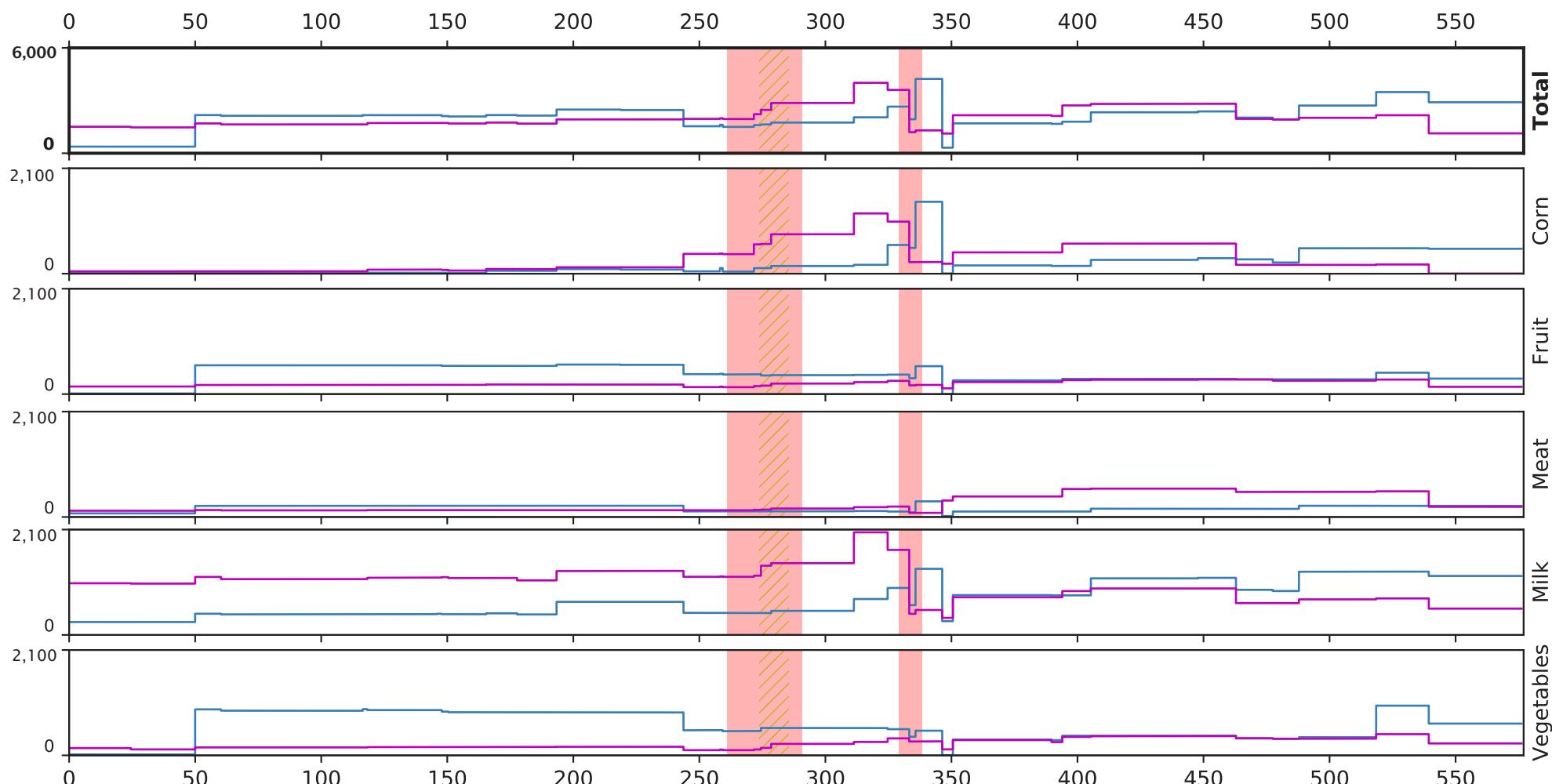
Corridor #1:
CA/OR Border to I-5/State Road-99 Interchange

TONNAGE (in millions of tons)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | — | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



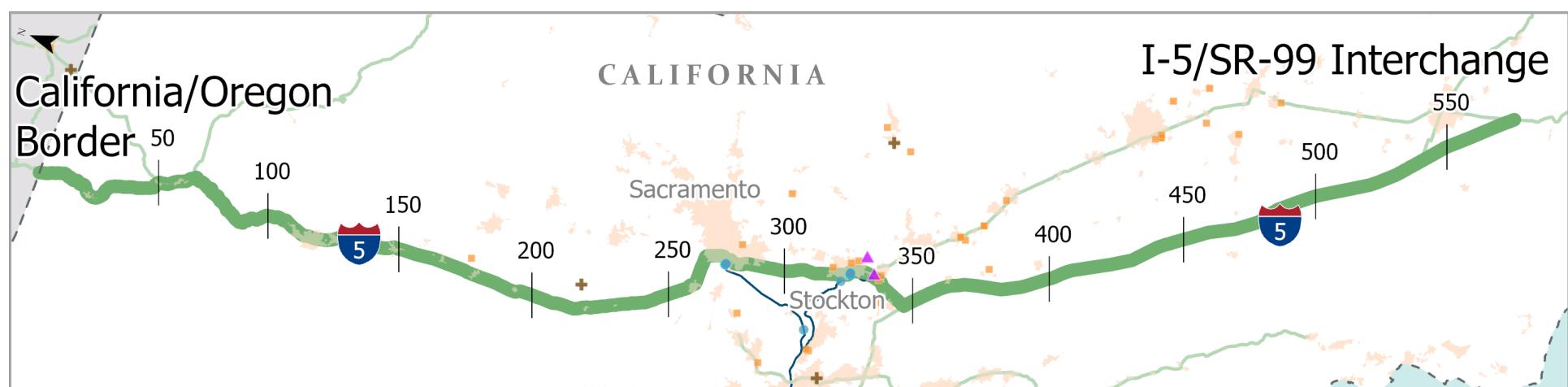
Traffic Direction

— OR/CA Border to I-5/SR-99

— I-5/SR-99 to OR/CA Border

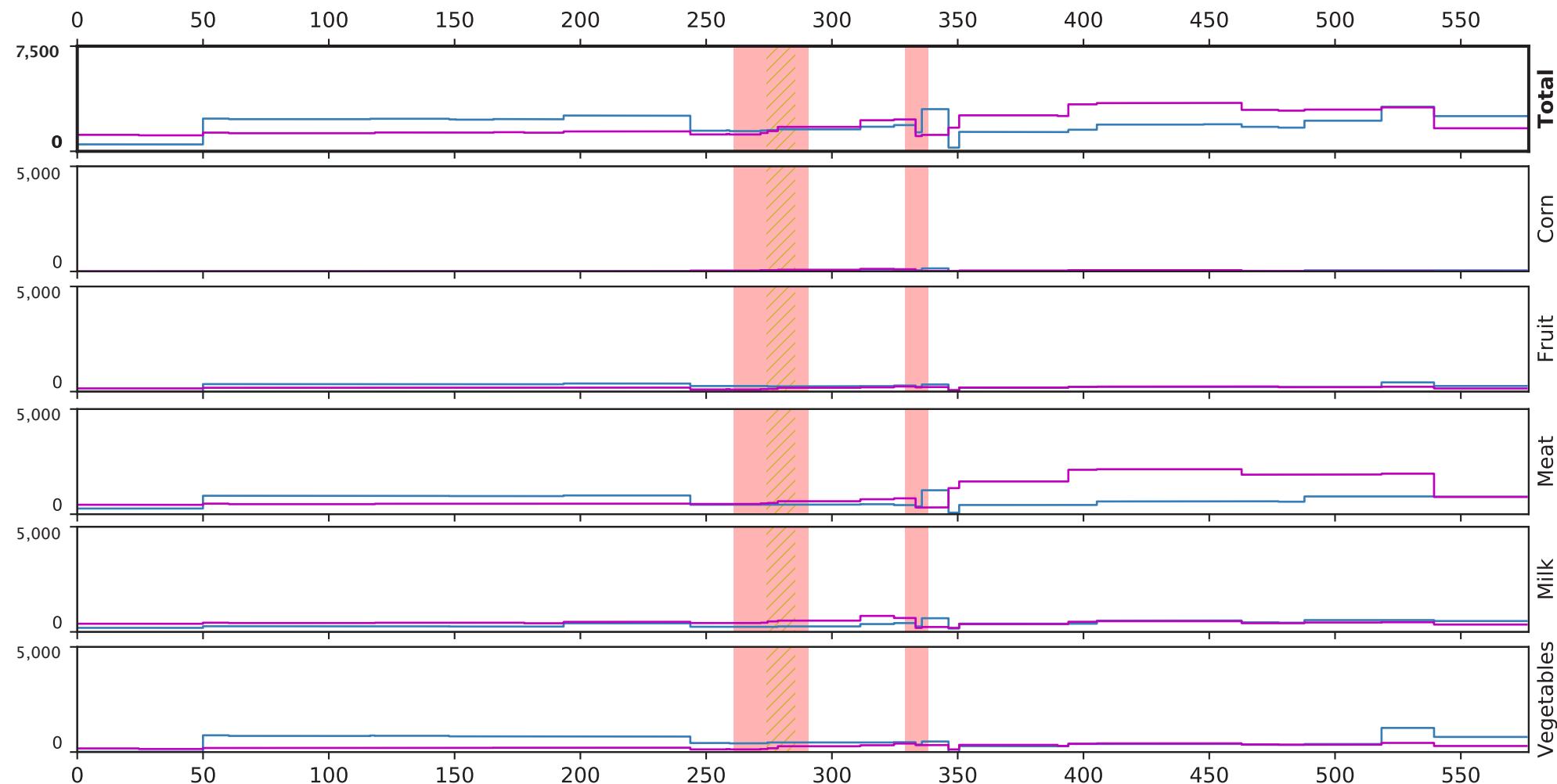
Corridor #1:
CA/OR Border to I-5/State Road-99 Interchange

VALUE (in millions of dollars)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ■ | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | — | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



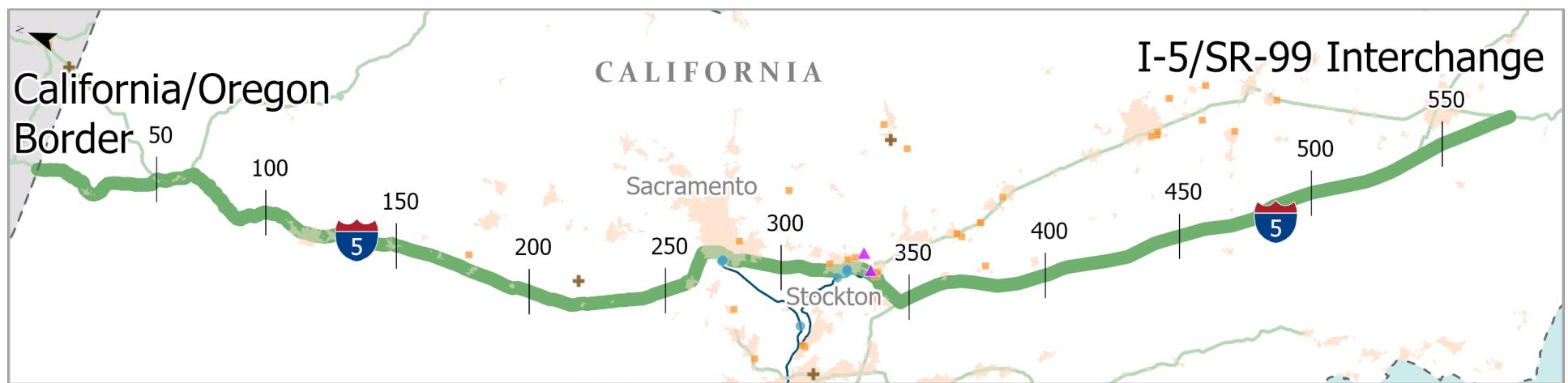
Traffic Direction

— OR/CA Border to I-5/SR-99

— I-5/SR-99 to OR/CA Border

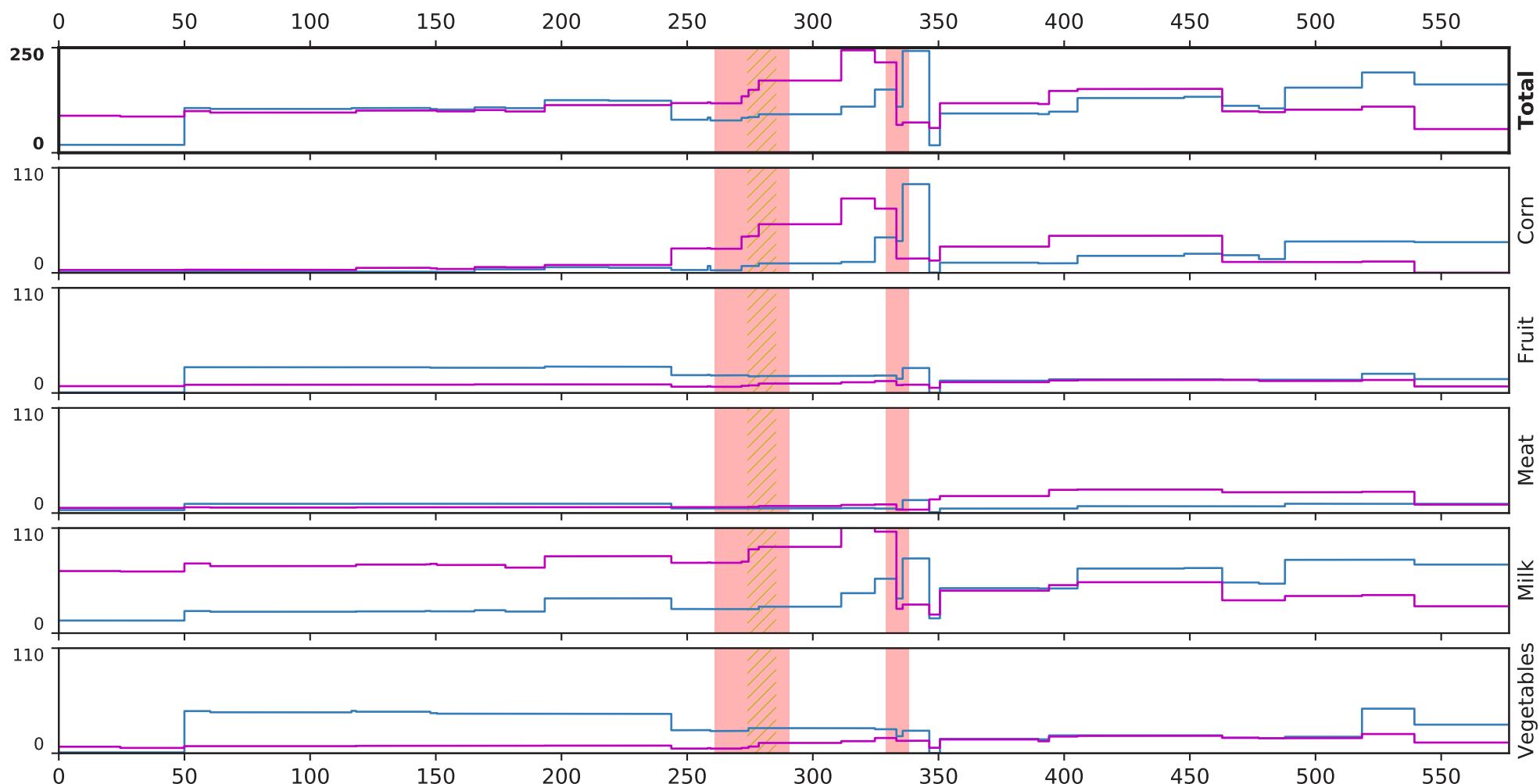
**Corridor #1:
CA/OR Border to I-5/State Road-99 Interchange**

UNITS (in thousands of trucks)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | — | Corridor Mile Marker |



DATA LEGEND

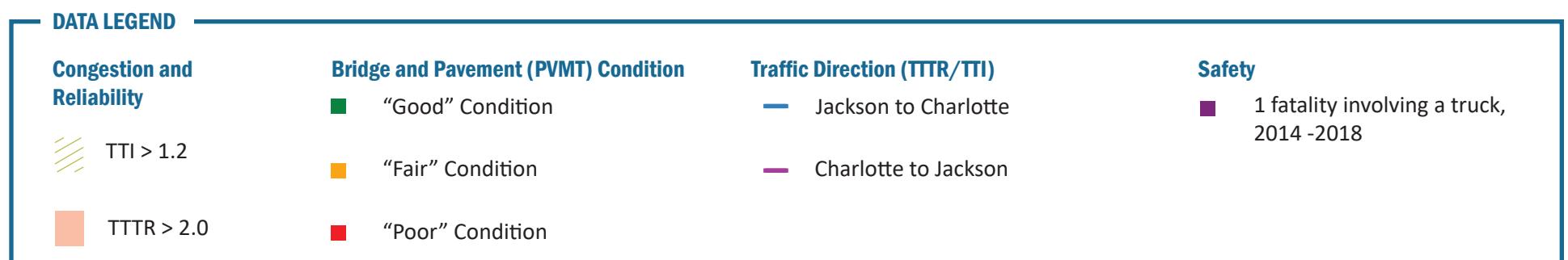
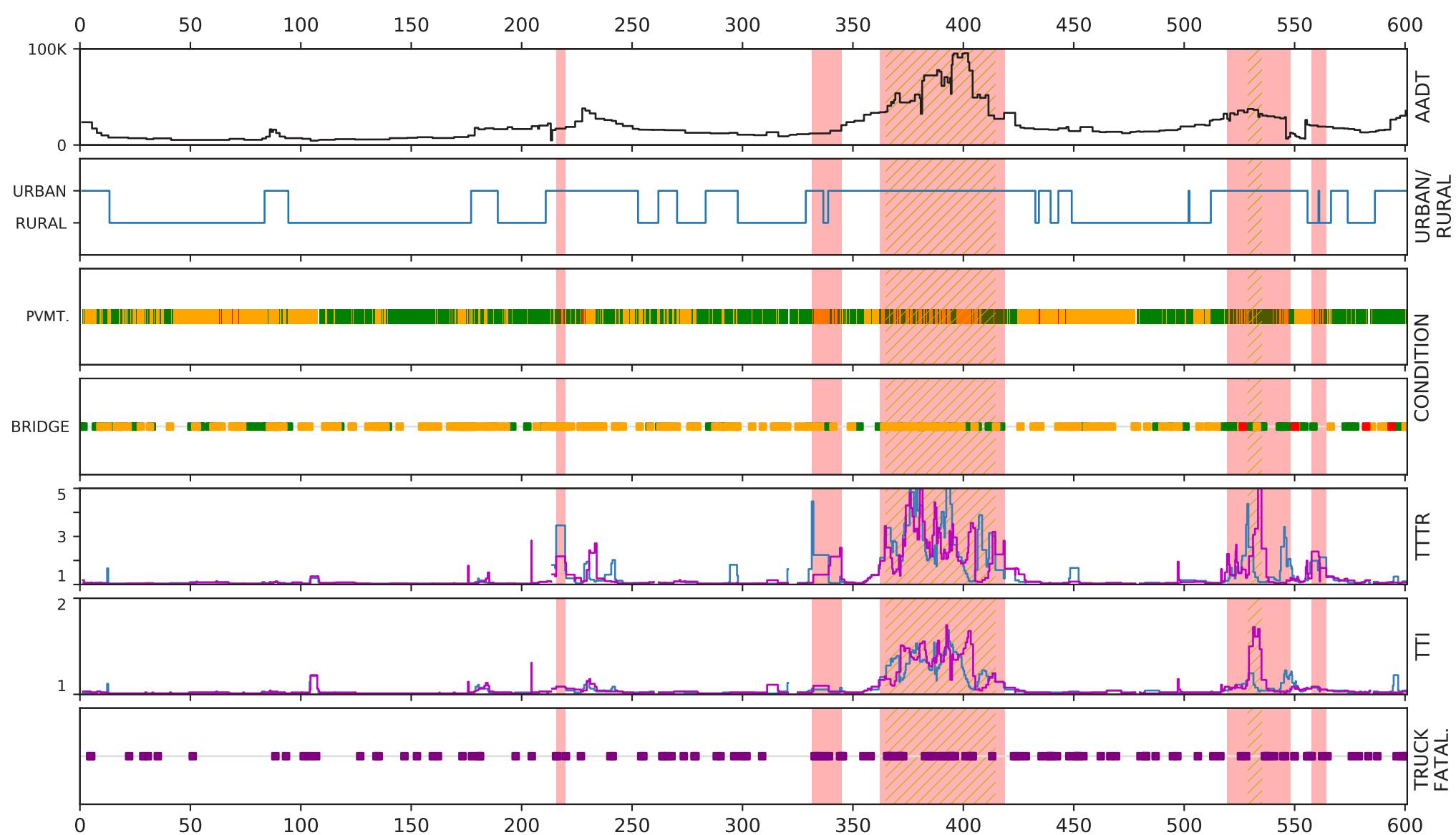
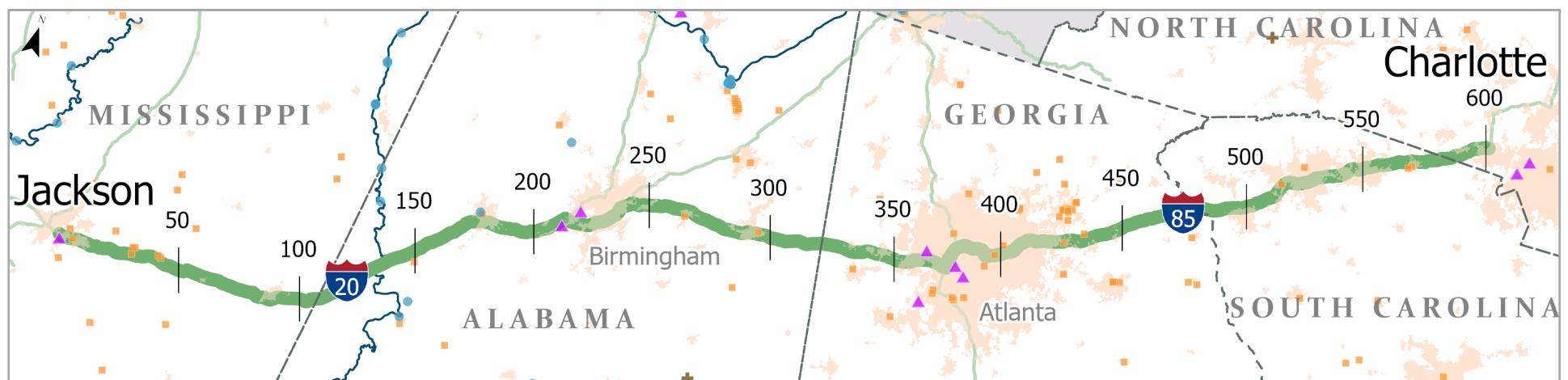
Congestion and Reliability



Traffic Direction

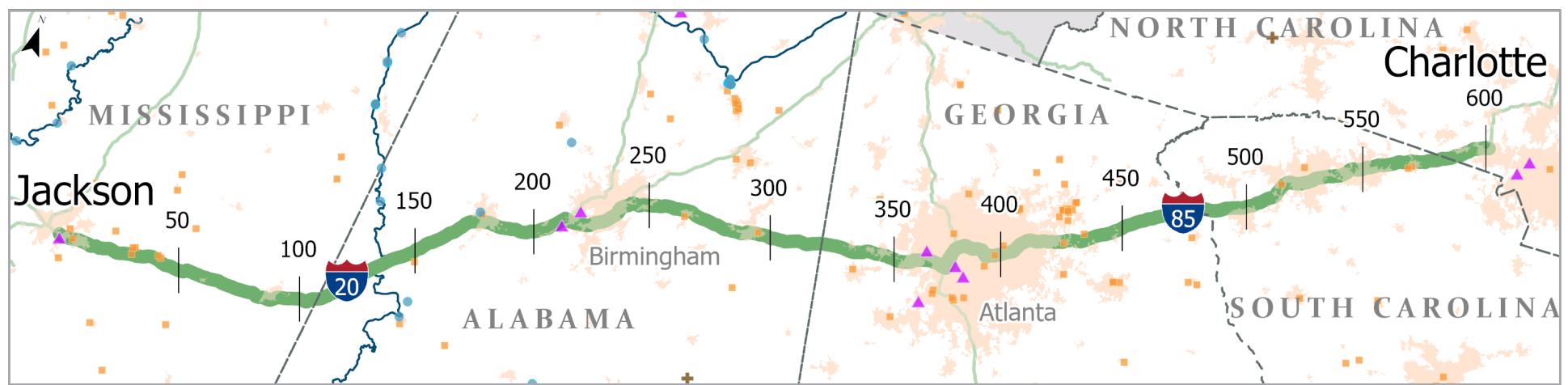
— OR/CA Border to I-5/SR-99

— I-5/SR-99 to OR/CA Border



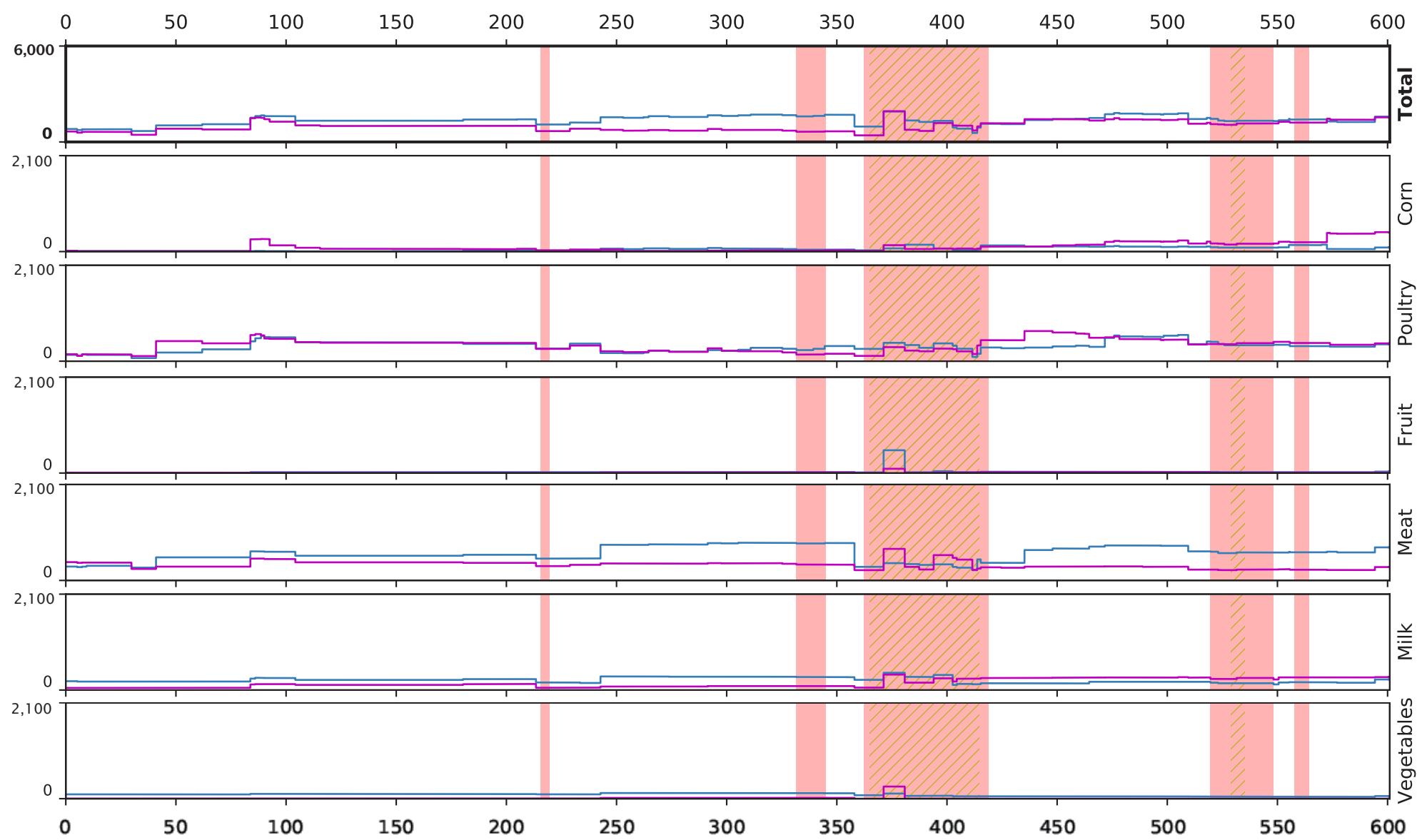
Corridor #2:
Jackson, MS, to Charlotte, NC

TONNAGE (in millions of tons)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability

TTI > 1.2

TTTR > 2.0

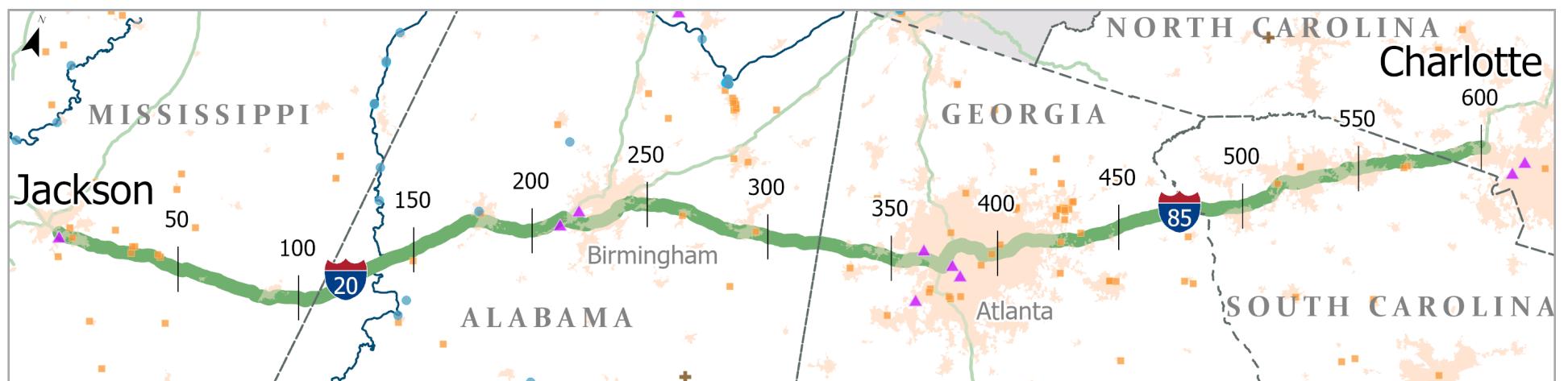
Traffic Direction

— Jackson to Charlotte

— Charlotte to Jackson

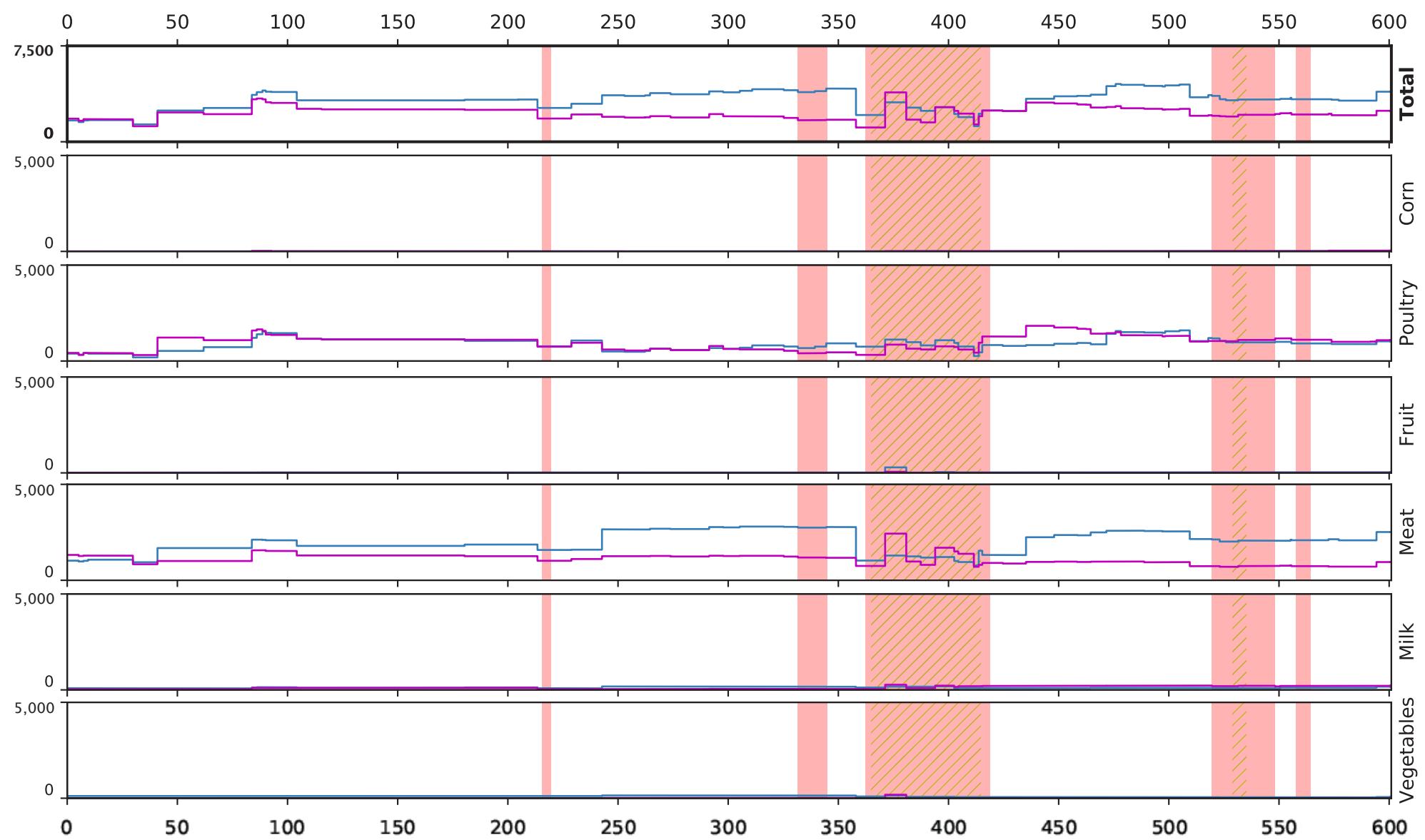
Corridor #2:
Jackson, MS, to Charlotte, NC

VALUE (in millions of dollars)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



TTI > 1.2



TTTR 2.0

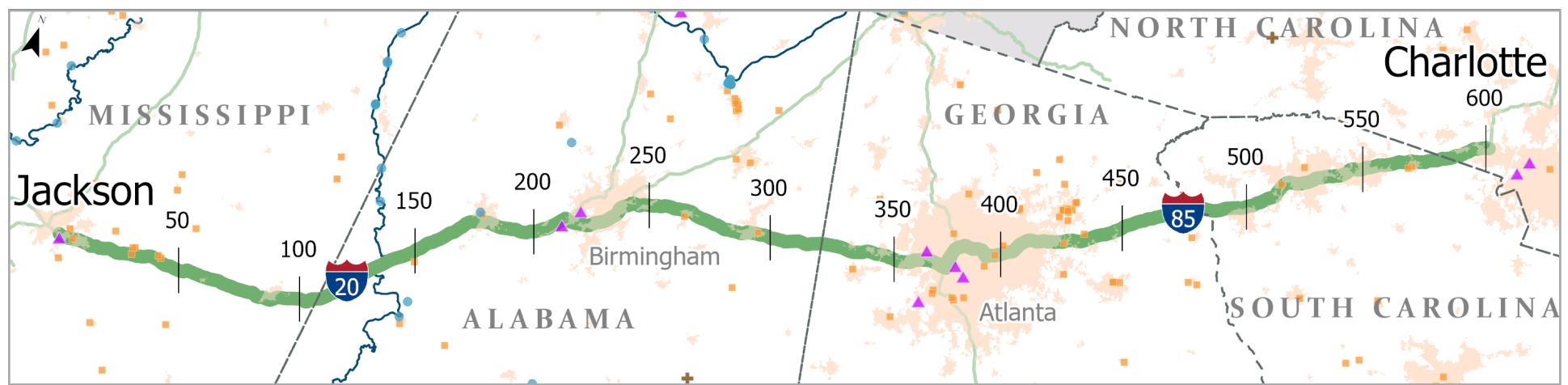
Traffic Direction

— Jackson to Charlotte

— Charlotte to Jackson

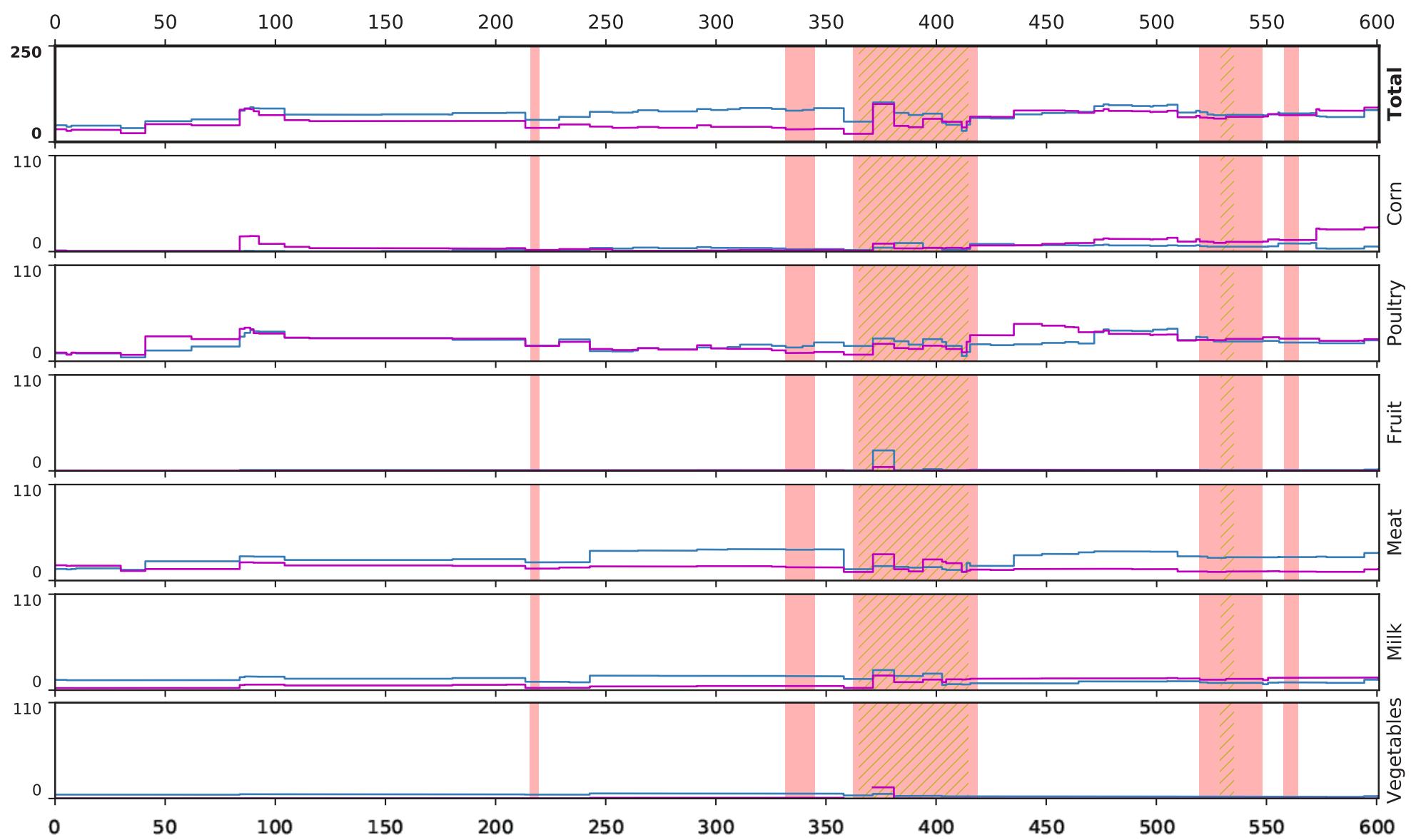
**Corridor #2:
Jackson, MS, to Charlotte, NC**

UNITS (in thousands of trucks)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | — | Corridor Mile Marker |



DATA LEGEND

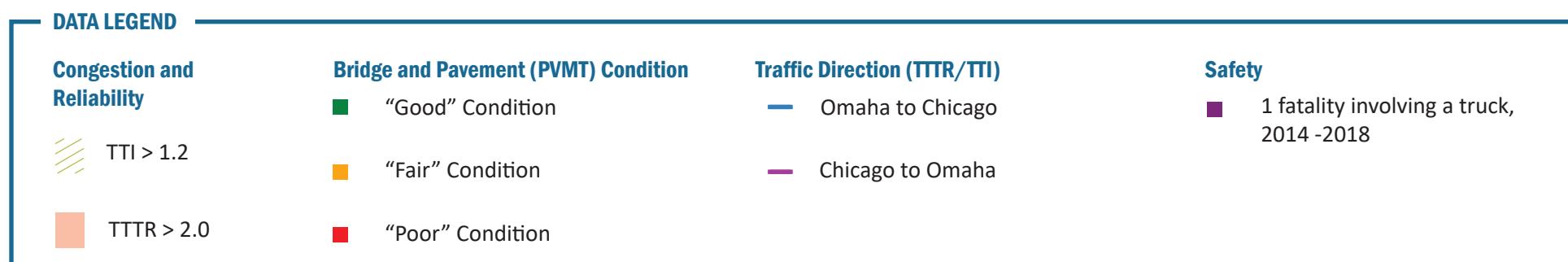
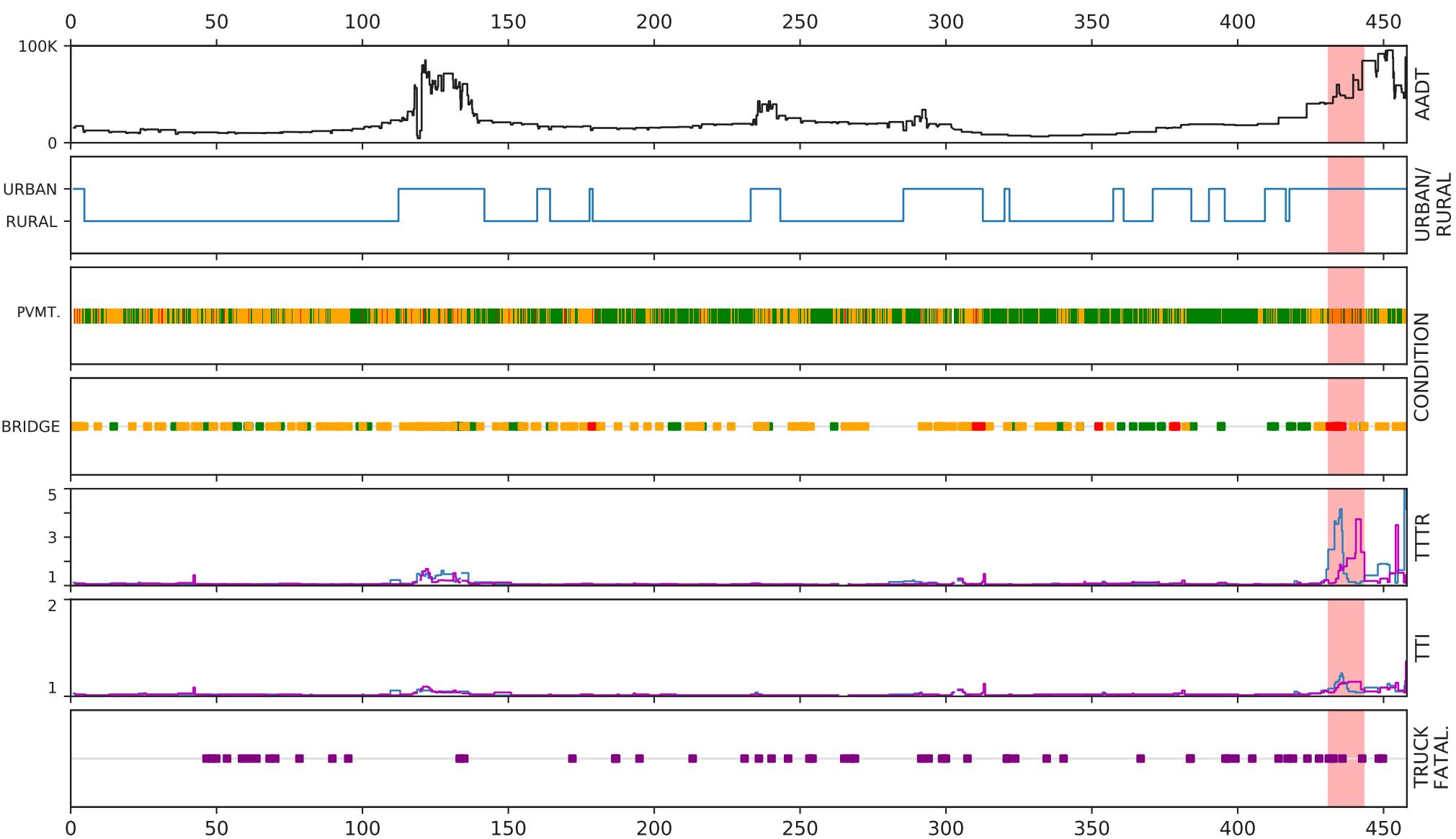
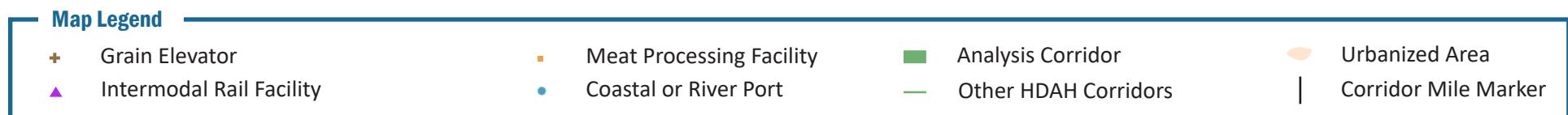
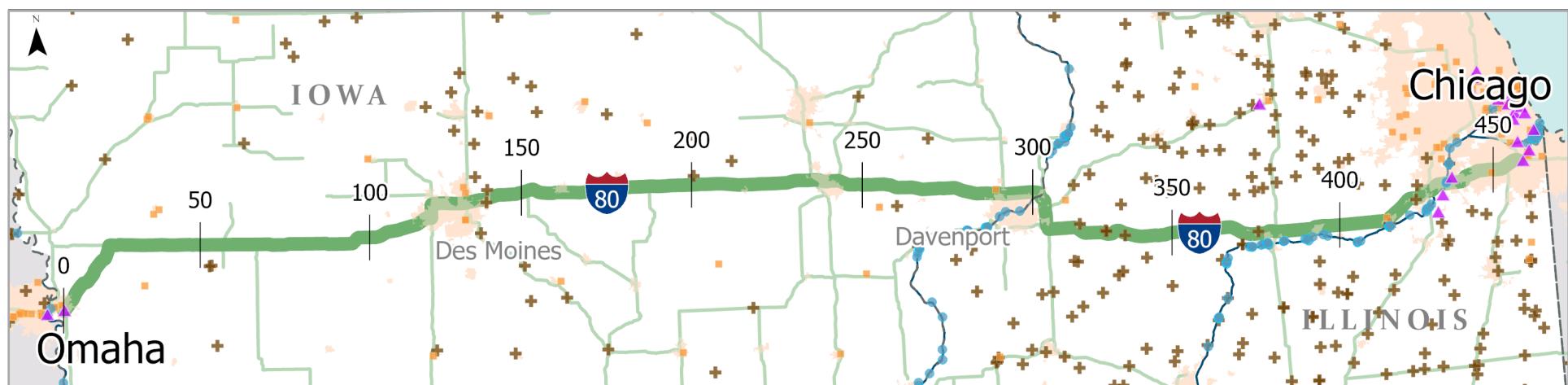
Congestion and Reliability



Traffic Direction

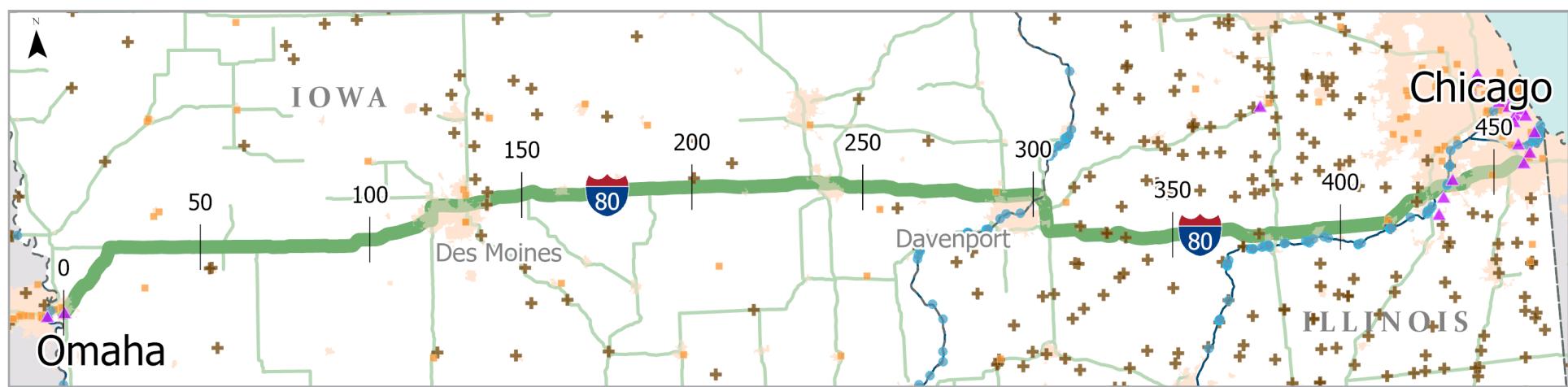
— Jackson to Charlotte

— Charlotte to Jackson



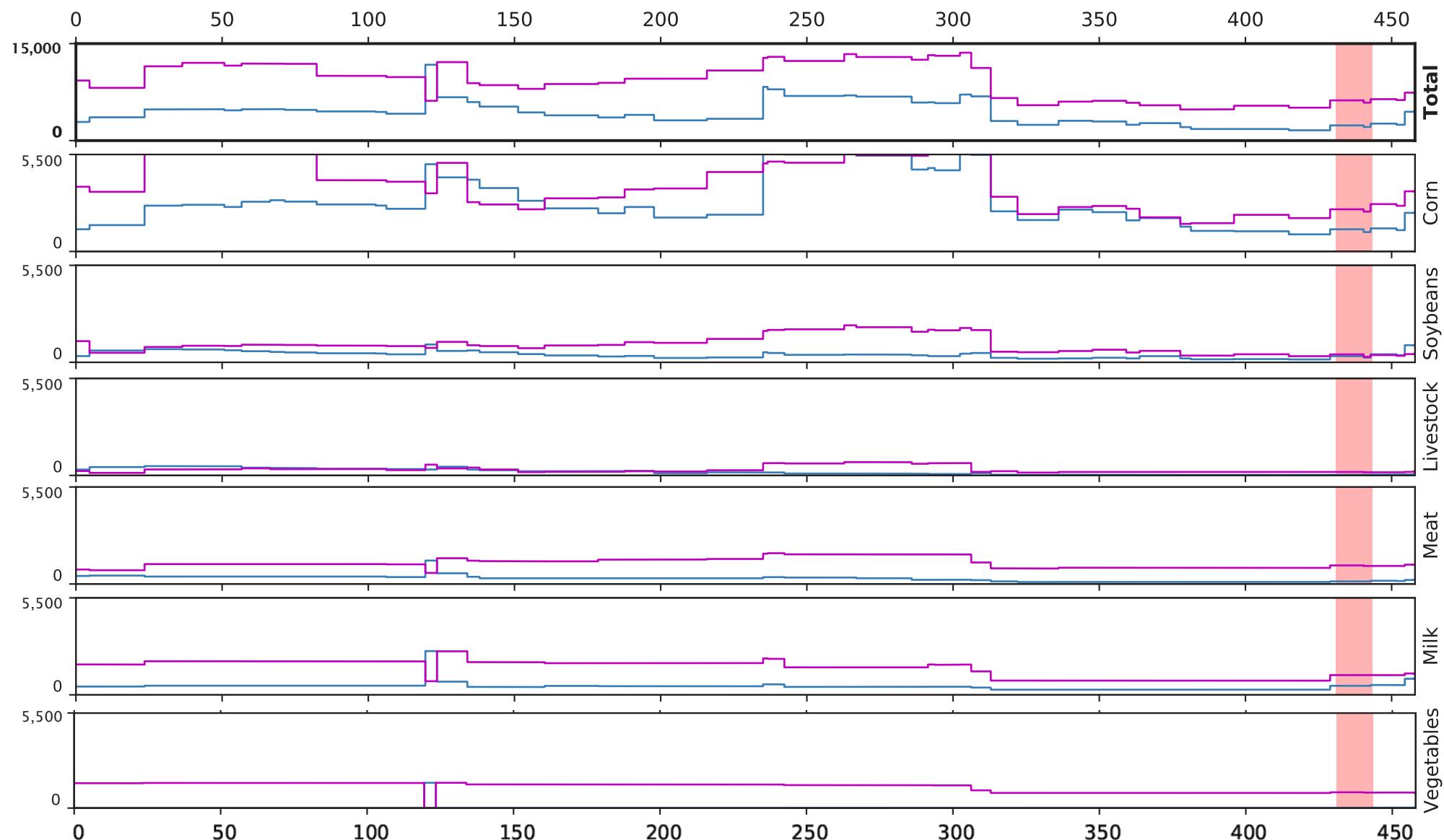
Corridor #3:
Omaha, NE, to Chicago, IL

TONNAGE (in millions of tons)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ■ | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | — | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



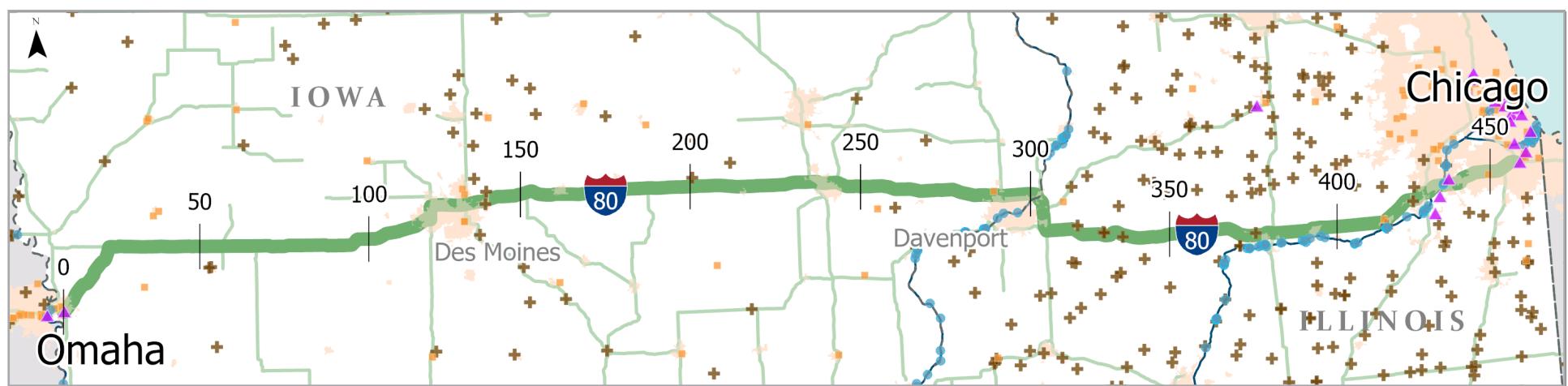
Traffic Direction

— Omaha to Chicago

— Chicago to Omaha

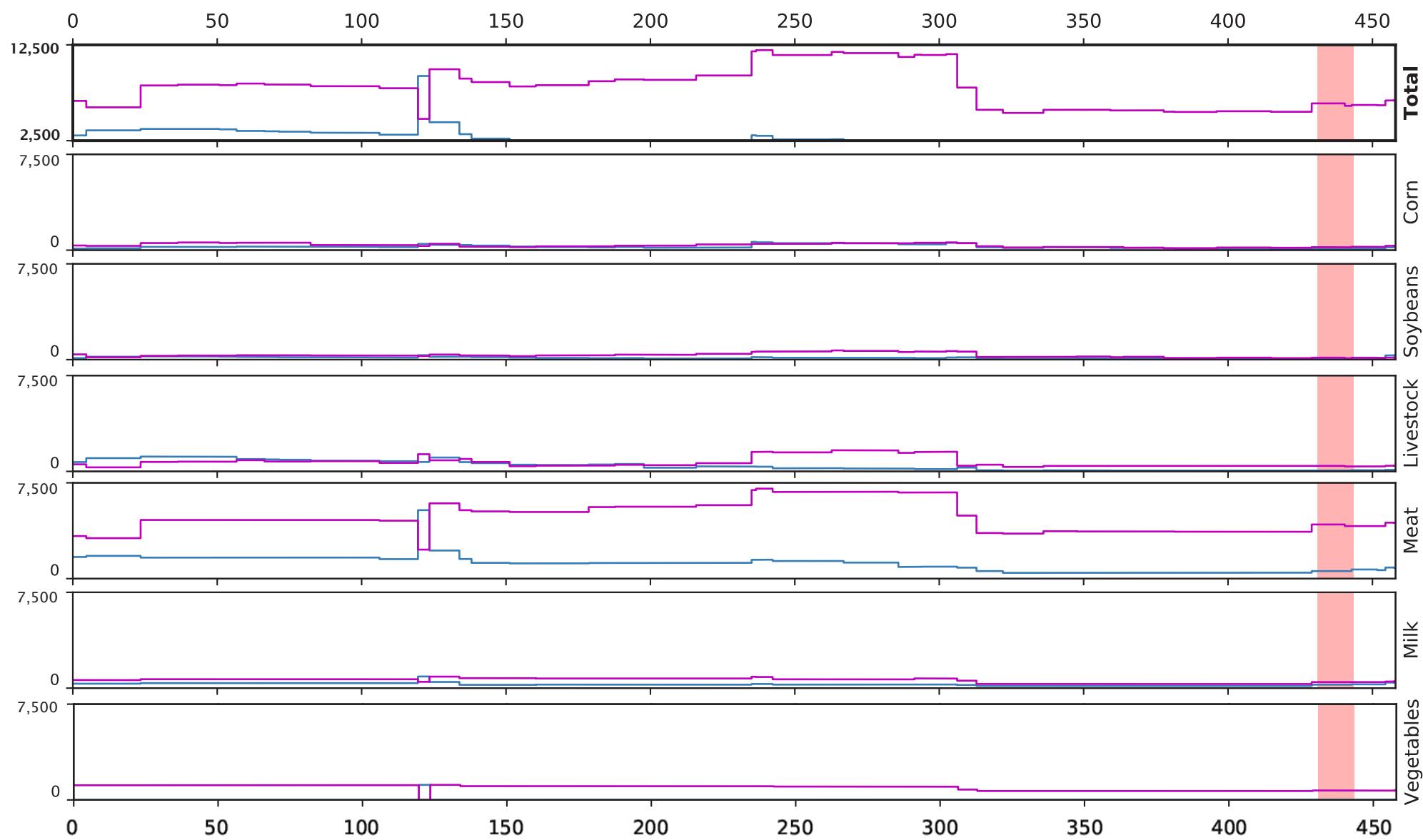
Corridor #3:
Omaha, NE, to Chicago, IL

VALUE (in millions of dollars)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | — | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



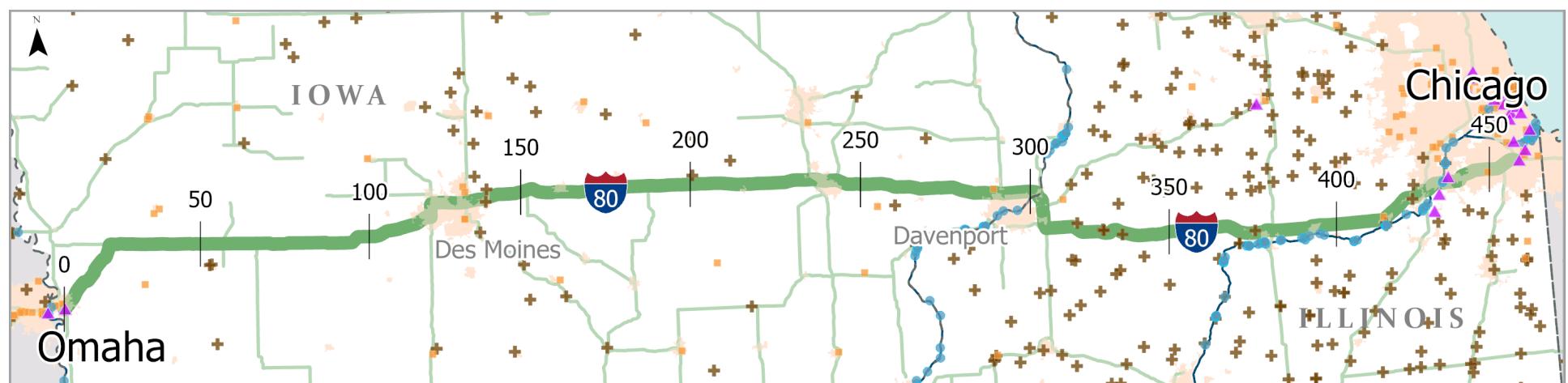
Traffic Direction

— Omaha to Chicago

— Chicago to Omaha

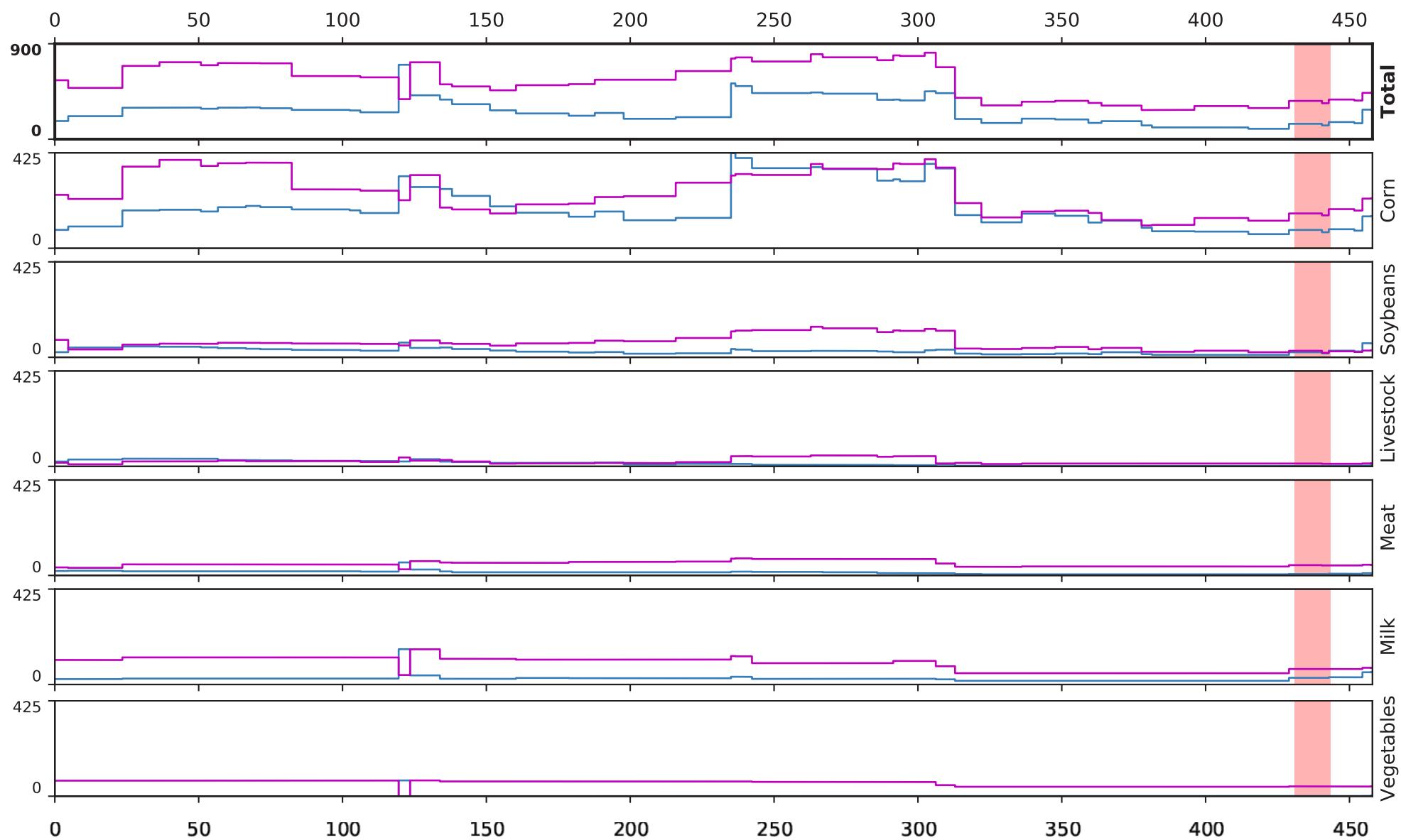
Corridor #3:
Omaha, NE, to Chicago, IL

UNITS (in thousands of trucks)



Map Legend

- | | | | |
|----------------------------|----------------------------|------------------------|----------------------|
| + Grain Elevator | ■ Meat Processing Facility | ■ Analysis Corridor | ● Urbanized Area |
| ▲ Intermodal Rail Facility | ● Coastal or River Port | — Other HDAH Corridors | Corridor Mile Marker |



DATA LEGEND

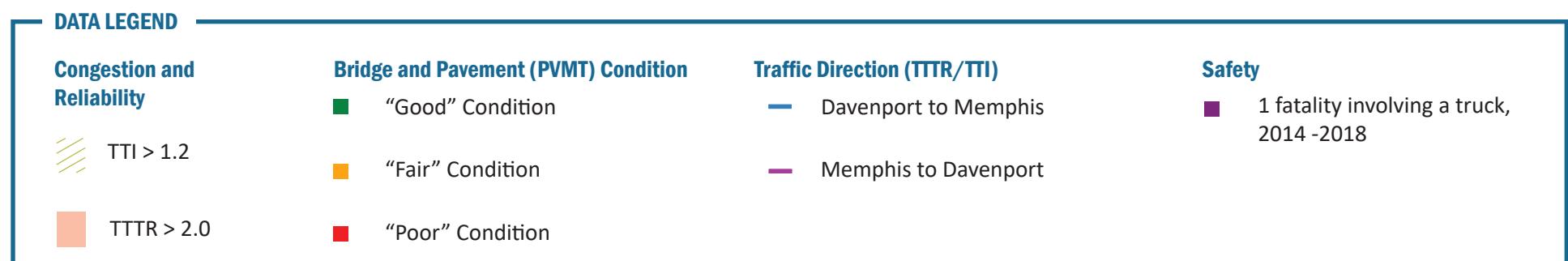
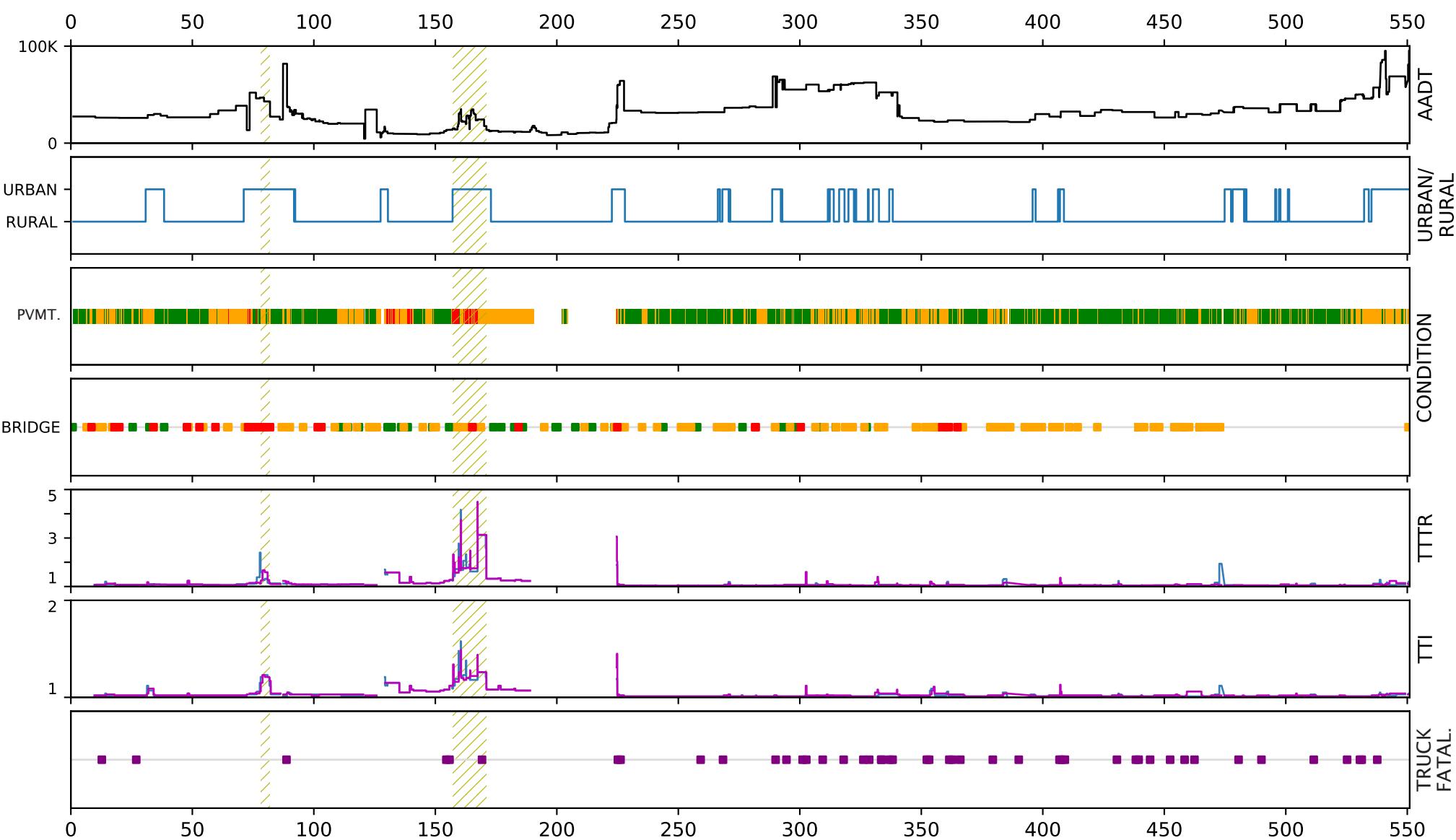
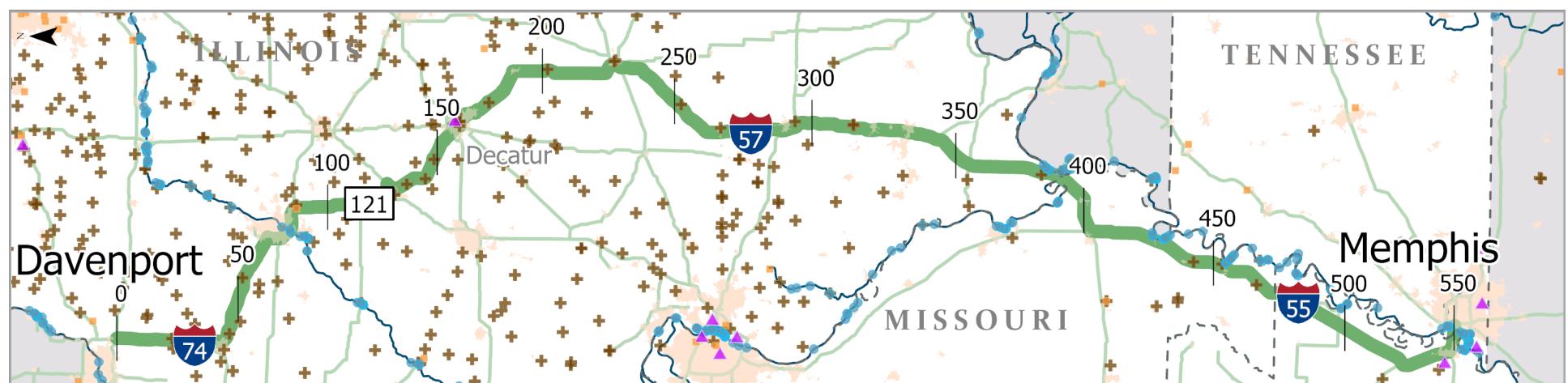
Congestion and Reliability



Traffic Direction

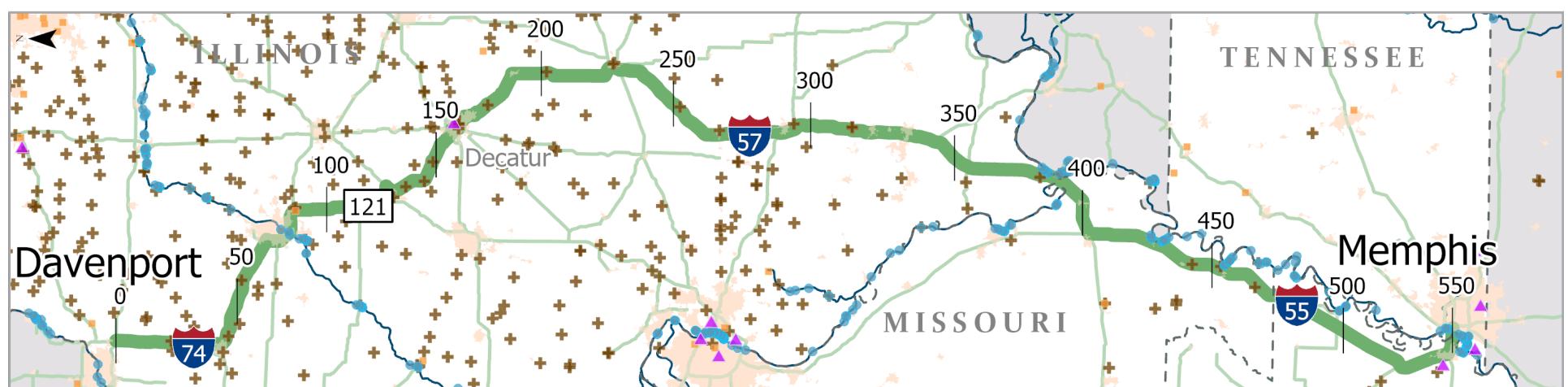
— Omaha to Chicago

— Chicago to Omaha



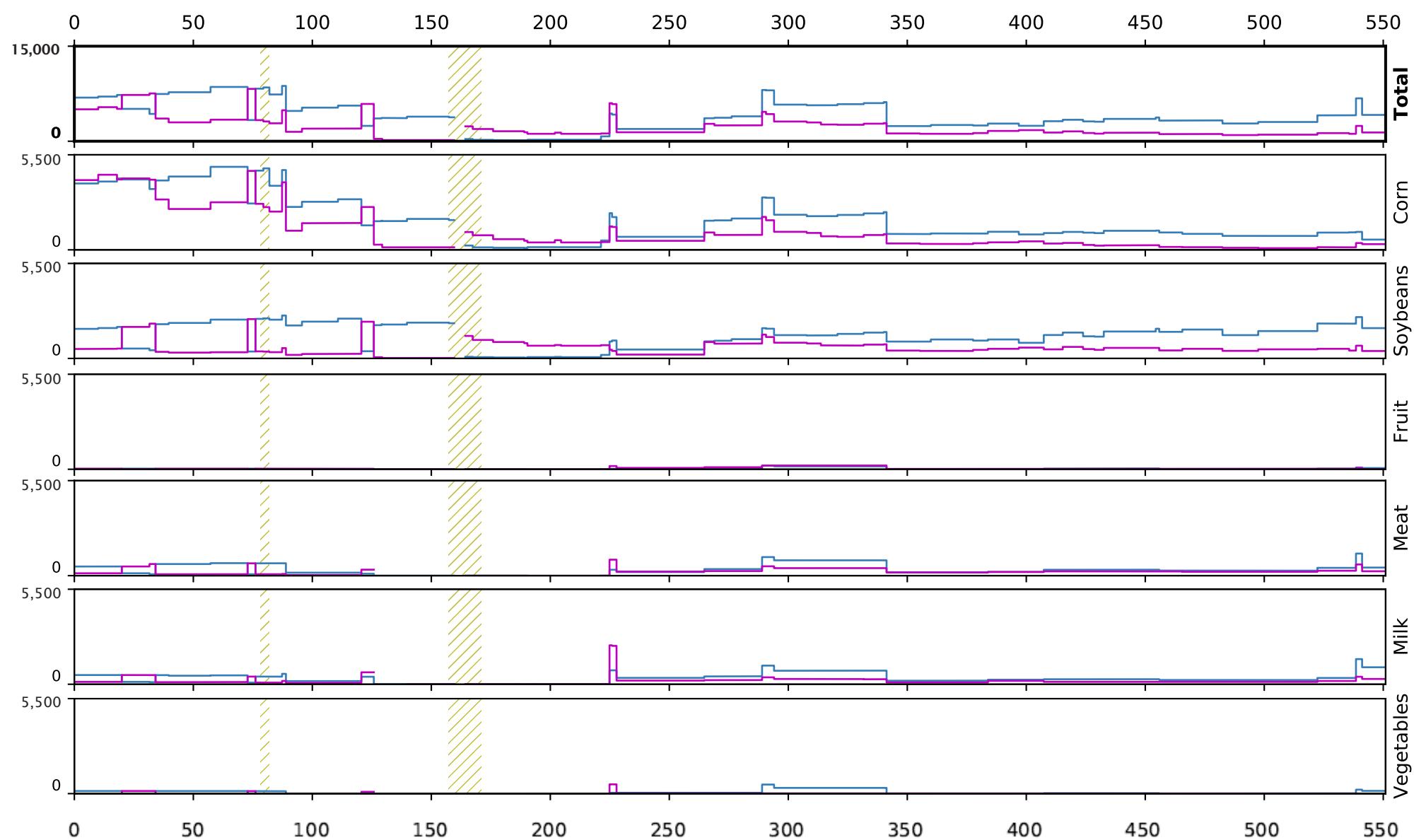
Corridor #4:
Davenport, IA, to Memphis, TN

TONNAGE (in millions of tons)



Map Legend

- | | | | |
|----------------------------|----------------------------|------------------------|----------------------|
| + Grain Elevator | ■ Meat Processing Facility | ■ Analysis Corridor | ● Urbanized Area |
| ▲ Intermodal Rail Facility | ● Coastal or River Port | — Other HDAH Corridors | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



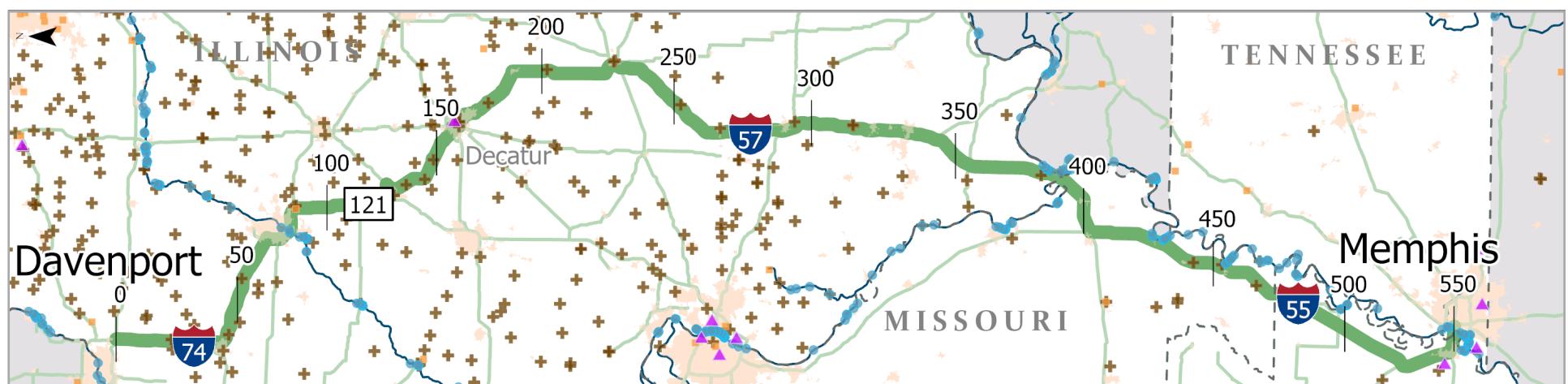
Traffic Direction

— Davenport to Memphis

— Memphis to Davenport

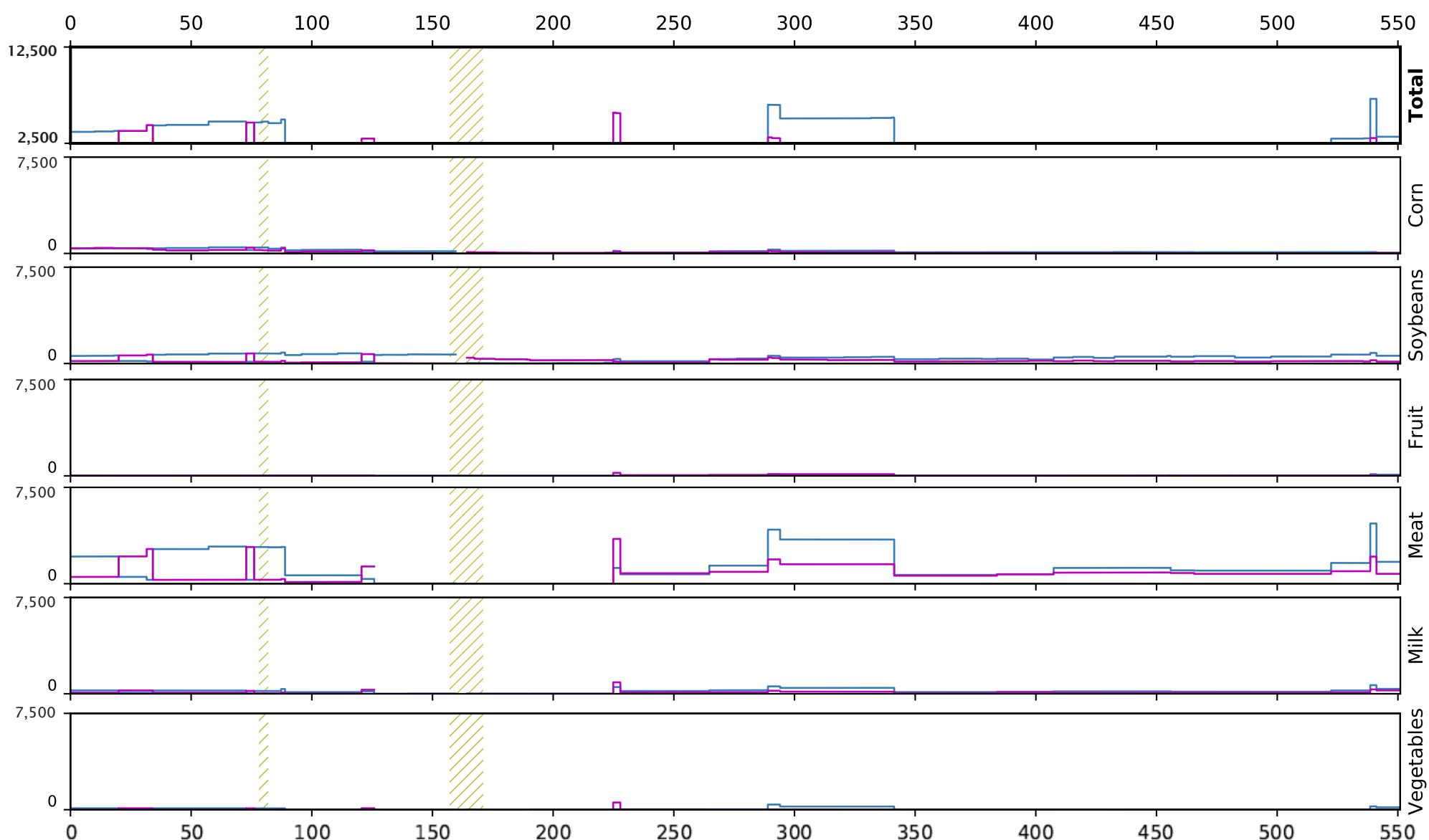
Corridor #4:
Davenport, IA, to Memphis, TN

VALUE (in millions of dollars)



Map Legend

- | | | | |
|----------------------------|----------------------------|------------------------|----------------------|
| + Grain Elevator | ■ Meat Processing Facility | ■ Analysis Corridor | Urbanized Area |
| ▲ Intermodal Rail Facility | ● Coastal or River Port | — Other HDAH Corridors | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



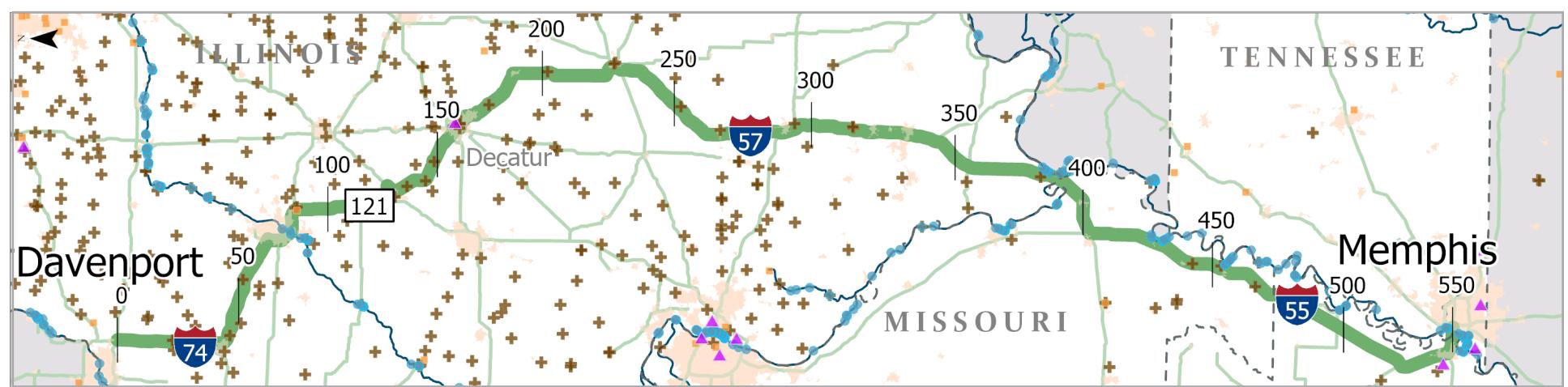
Traffic Direction

— Davenport to Memphis

— Memphis to Davenport

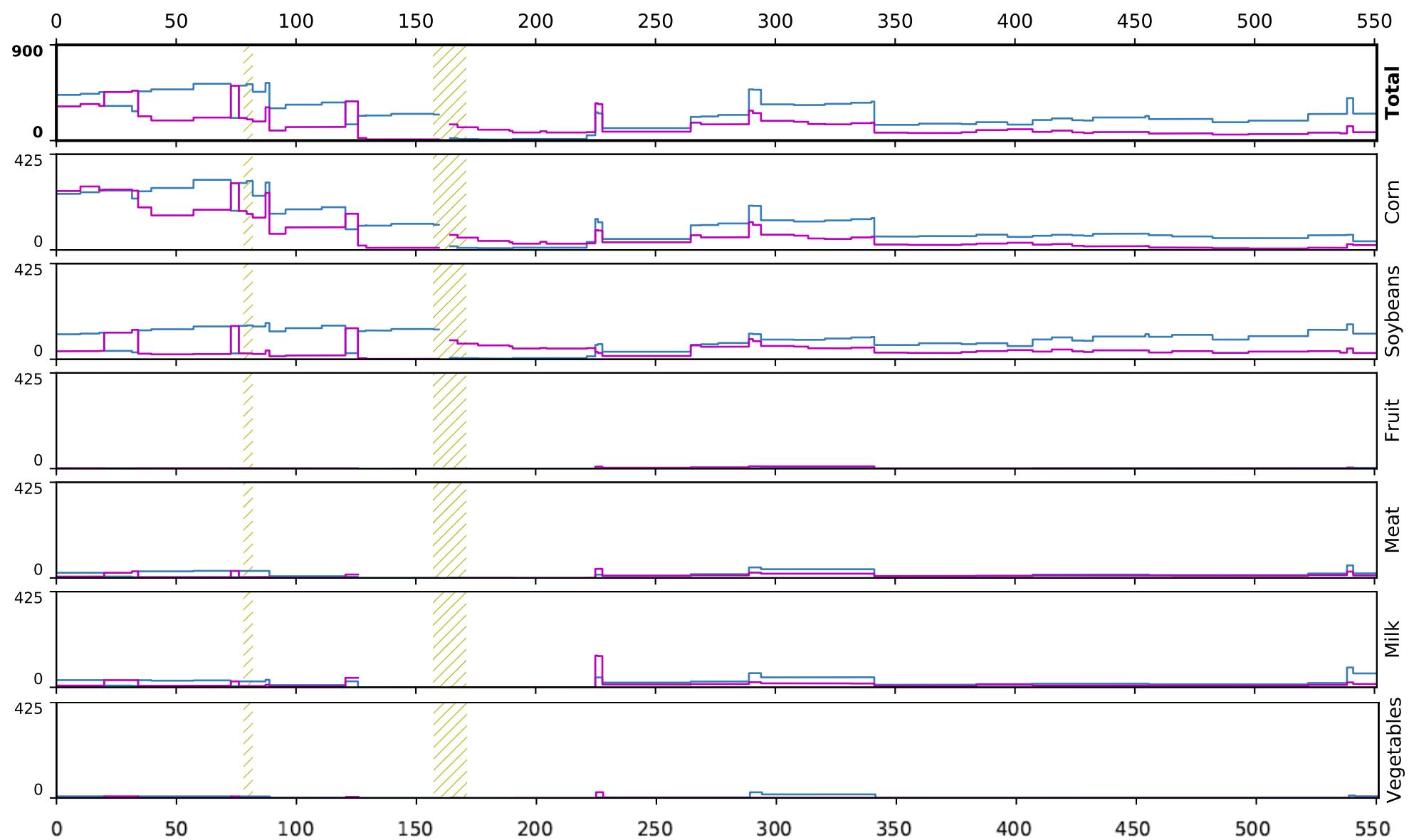
Corridor #4:
Davenport, IA ,to Memphis, TN

UNITS (in thousands of trucks)



Map Legend

- | | | | |
|----------------------------|----------------------------|------------------------|----------------------|
| + Grain Elevator | ■ Meat Processing Facility | ■ Analysis Corridor | Urbanized Area |
| ▲ Intermodal Rail Facility | ● Coastal or River Port | - Other HDAH Corridors | Corridor Mile Marker |



DATA LEGEND

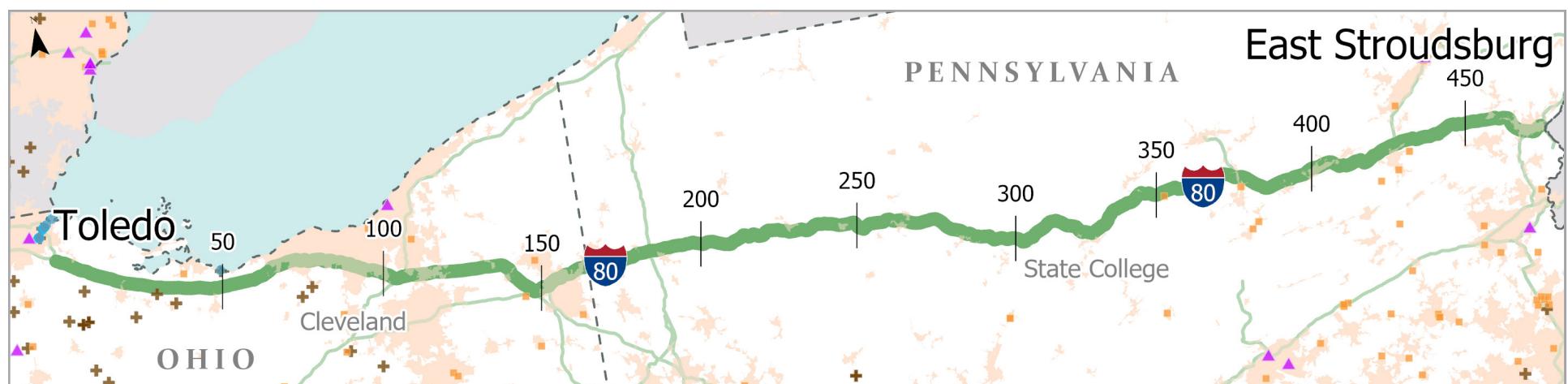
Congestion and Reliability



Traffic Direction

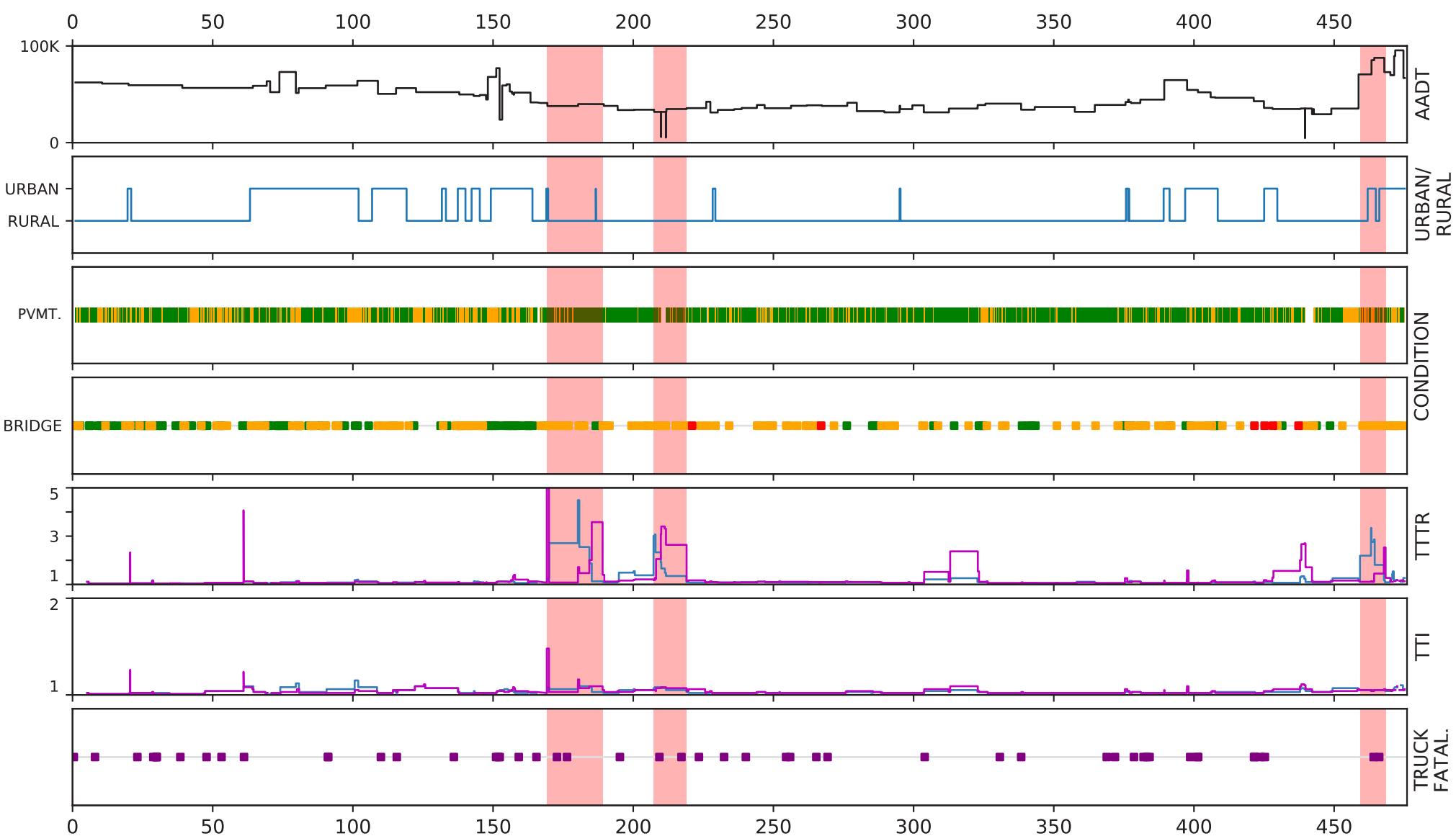
— Davenport to Memphis

— Memphis to Davenport



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability

TTI > 1.2

TTTR > 2.0

Bridge and Pavement (PVMT) Condition

■ "Good" Condition

■ "Fair" Condition

■ "Poor" Condition

Traffic Direction (TTTR/TI)

— Toledo to East Stroudsburg

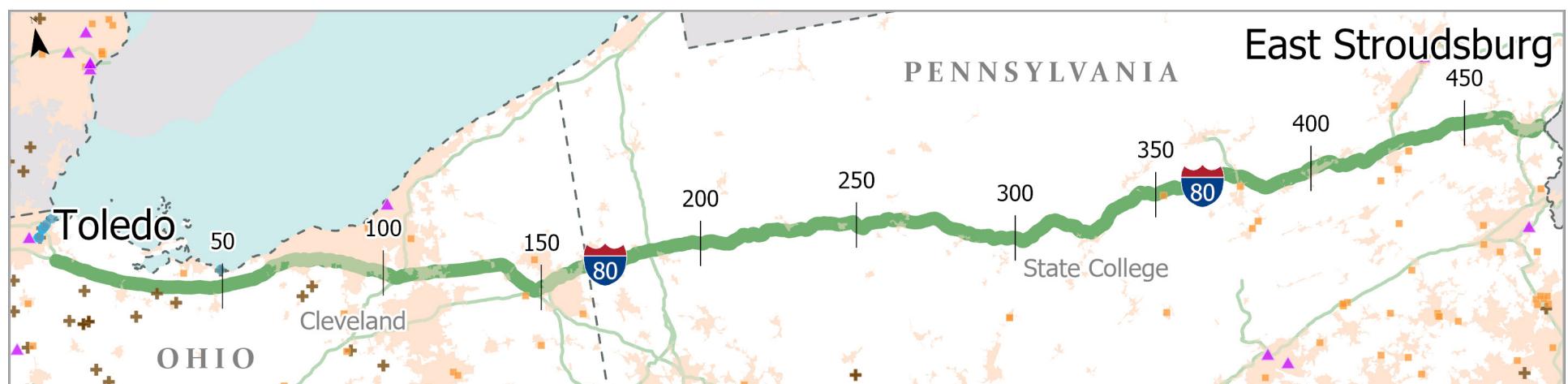
— East Stroudsburg to Toledo

Safety

■ 1 fatality involving a truck, 2014 - 2018

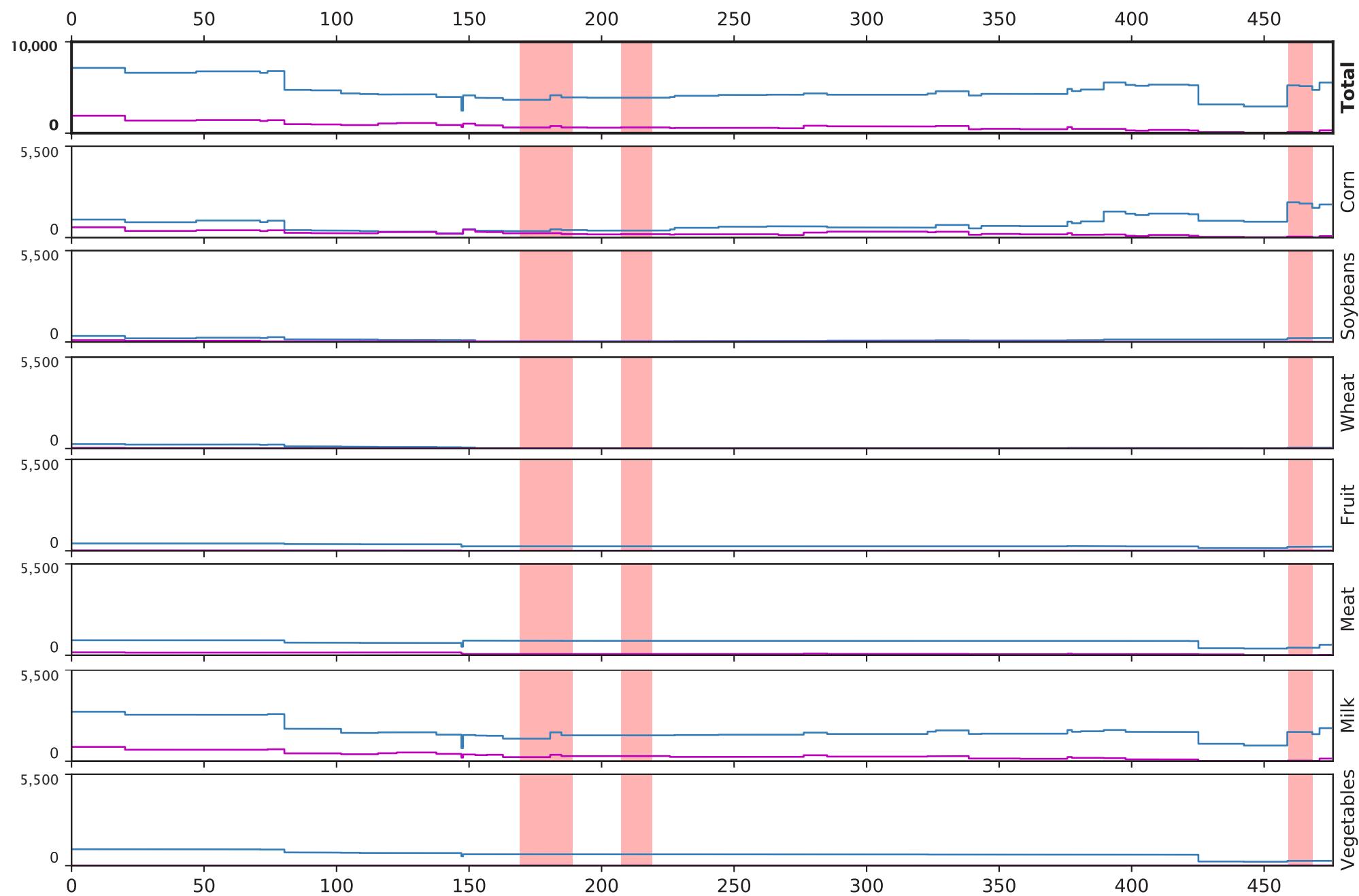
Corridor #5:
Toledo, OH, to E. Stroudsburg, PA

TONNAGE (in millions of tons)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



Traffic Direction

— Toledo to East Stroudsburg

— East Stroudsburg to Toledo

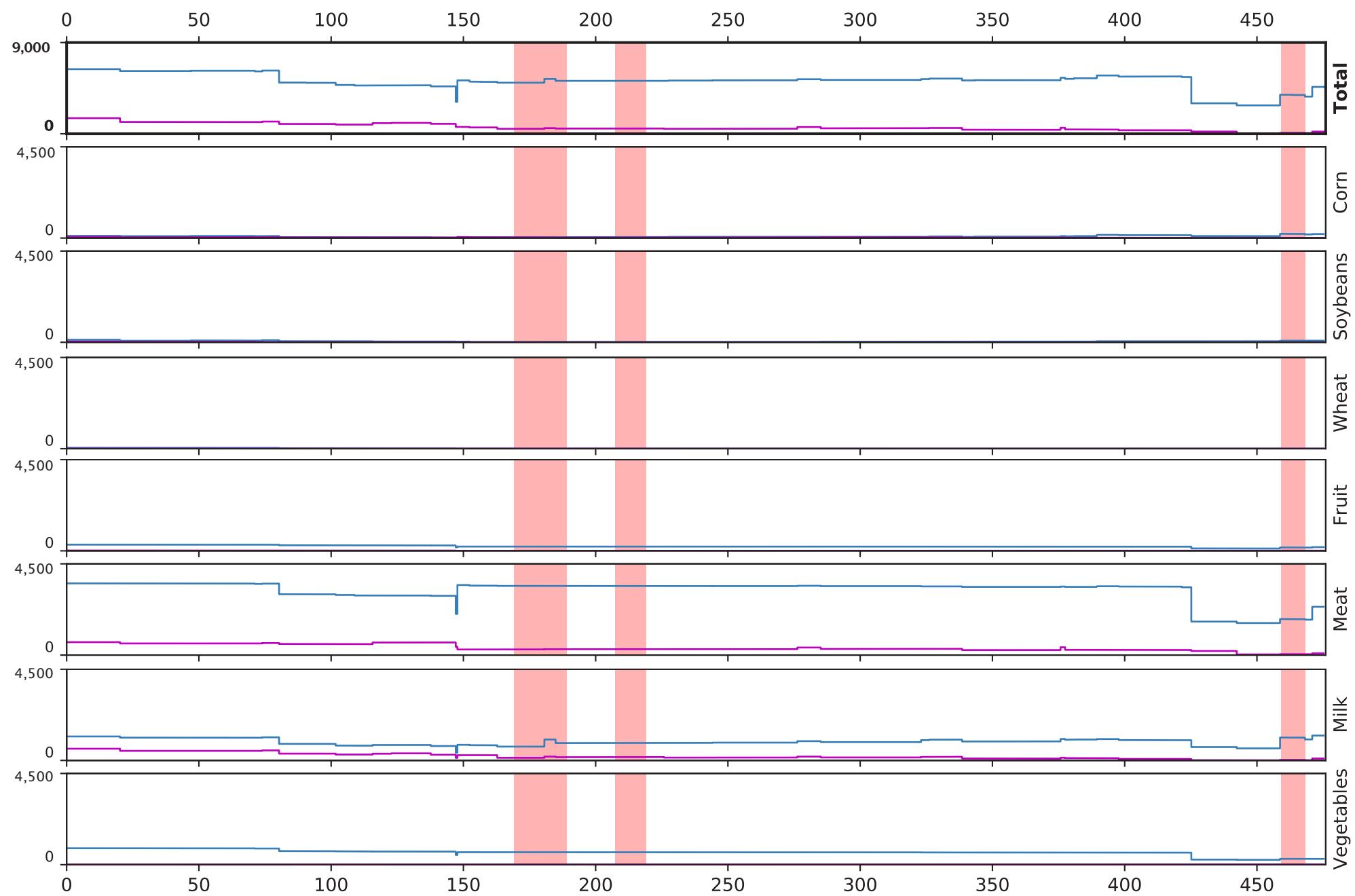
**Corridor #5:
Toledo, OH, to E. Stroudsburg, PA**

VALUE (in millions of dollars)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ■ | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



TTI > 2.0

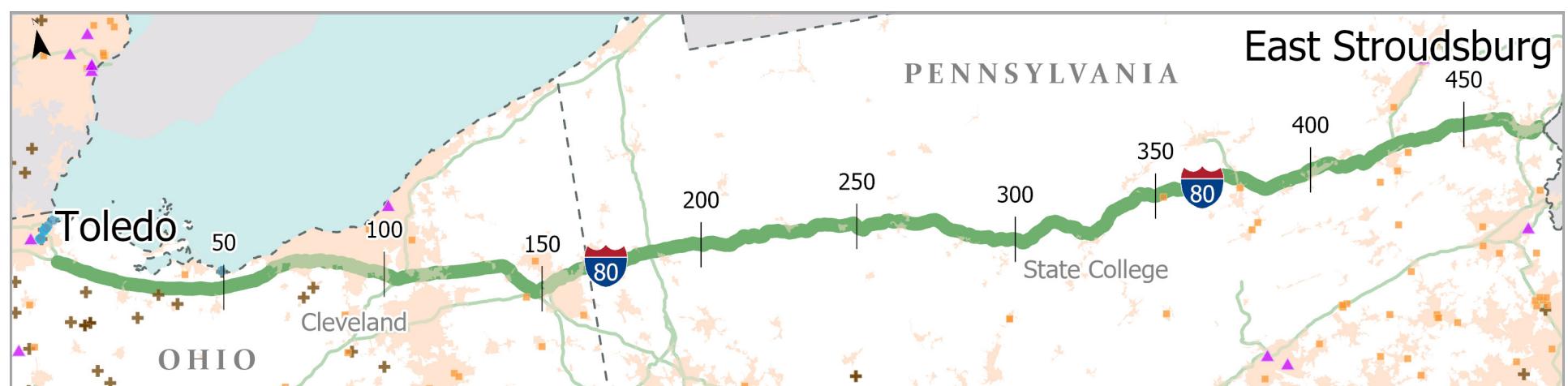
Traffic Direction

— Toledo to East Stroudsburg

— East Stroudsburg to Toledo

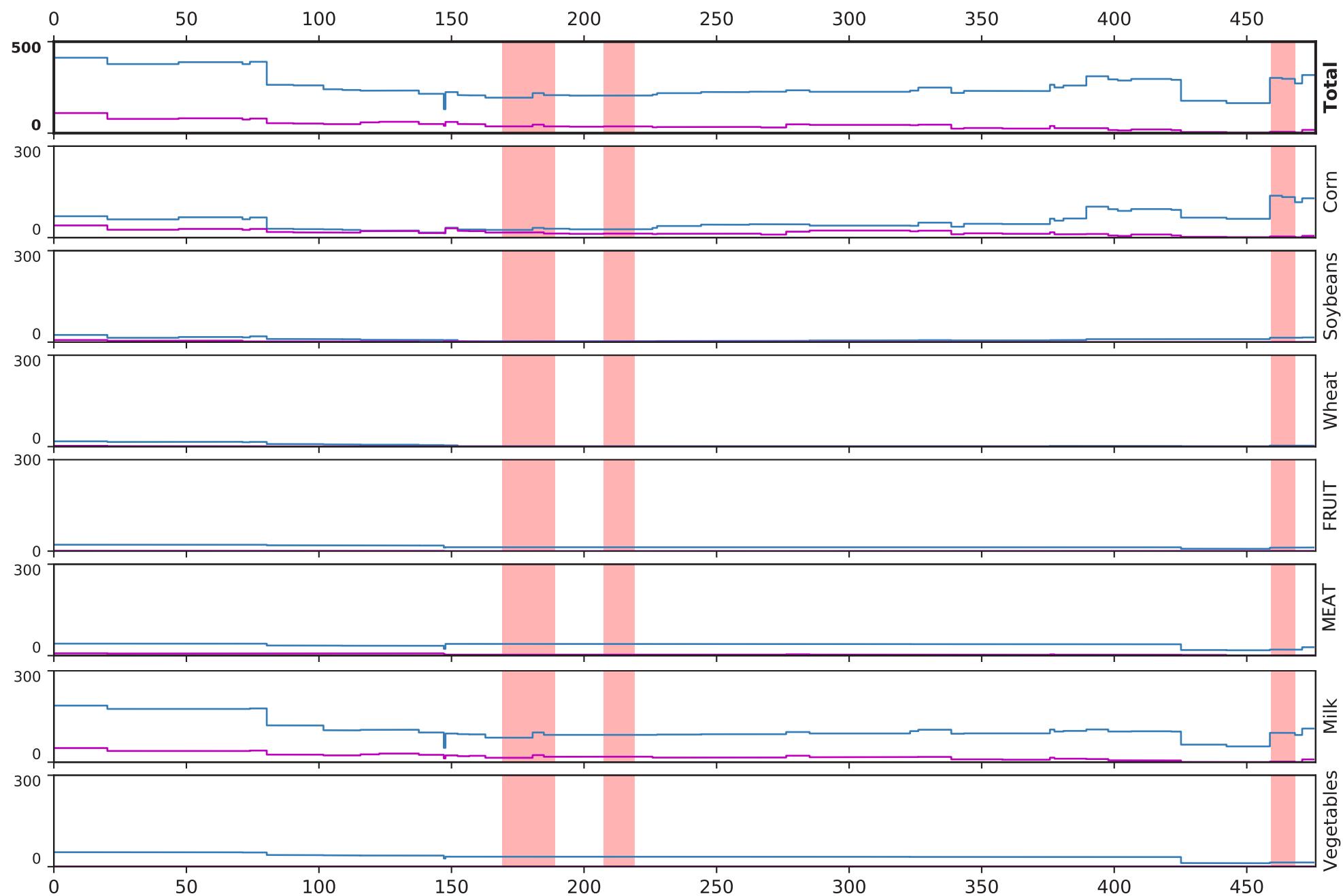
Corridor #5:
Toledo, OH, to E. Stroudsburg, PA

UNITS (in thousands of trucks)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ○ | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



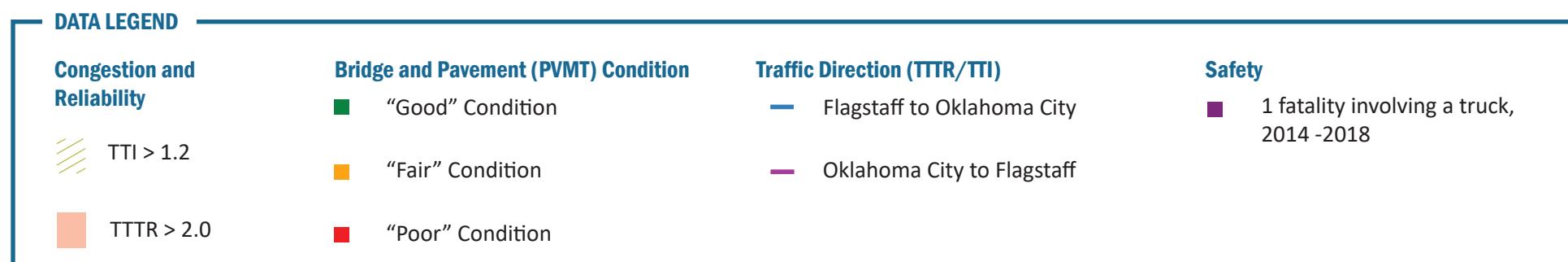
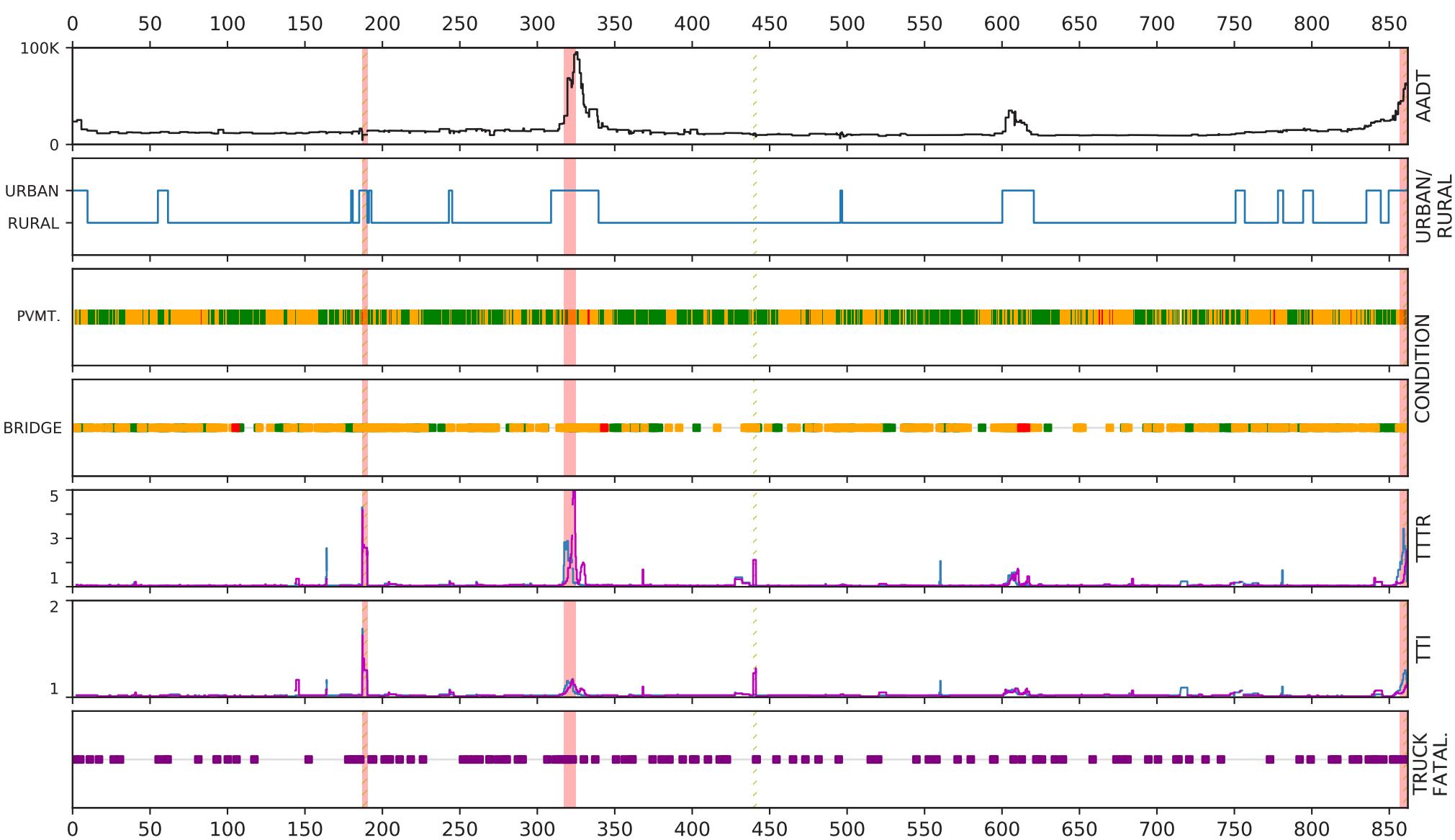
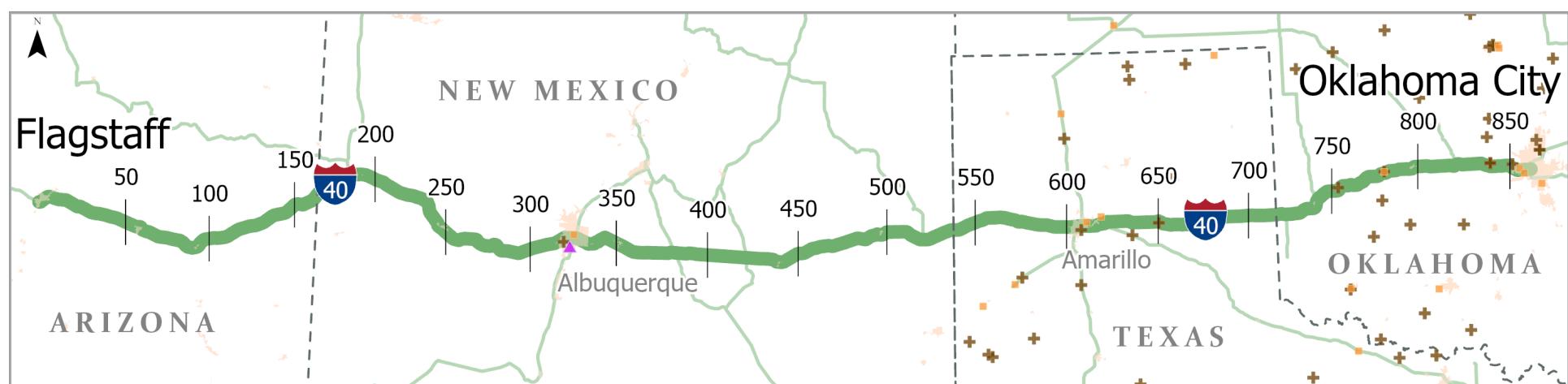
Traffic Direction

— Toledo to East Stroudsburg

— East Stroudsburg to Toledo

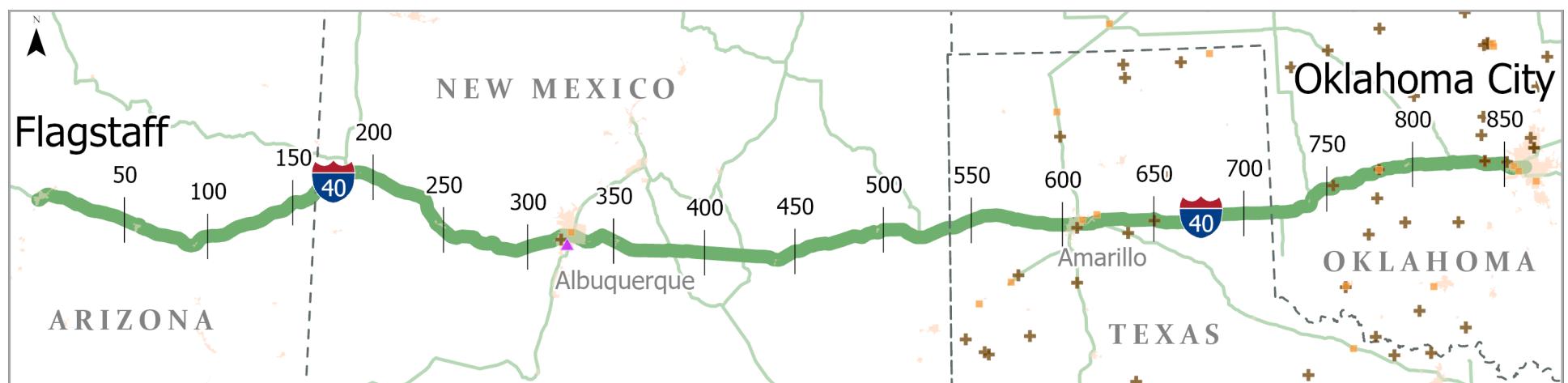
Corridor #6:
Flagstaff, AZ, to Oklahoma City, OK

CONDITIONS & PERFORMANCE



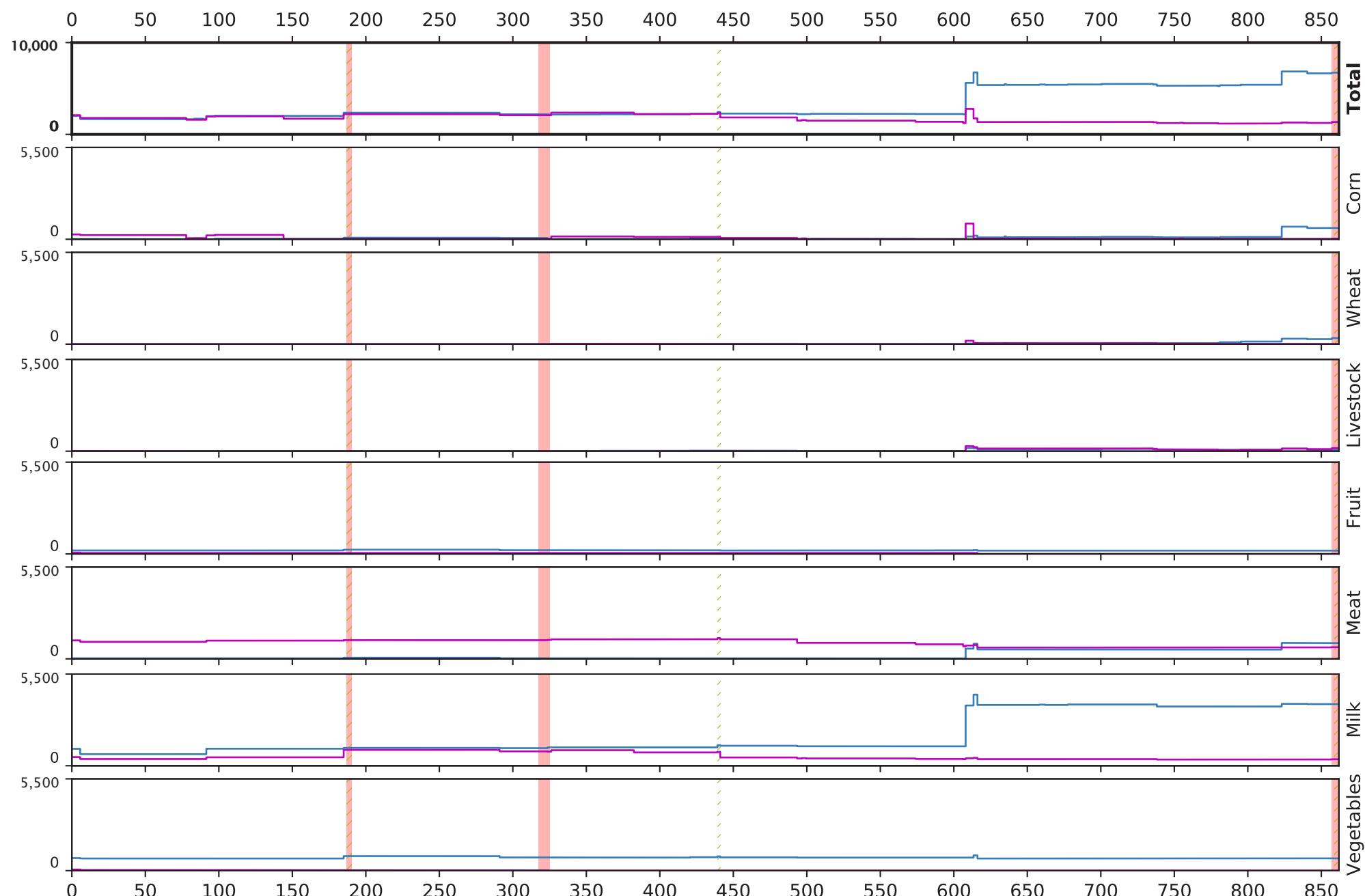
Corridor #6:
Flagstaff, AZ, to Oklahoma City, OK

TONNAGE (in millions of tons)



Map Legend

- | | | | |
|----------------------------|----------------------------|------------------------|----------------------|
| + Grain Elevator | ■ Meat Processing Facility | ■ Analysis Corridor | ● Urbanized Area |
| ▲ Intermodal Rail Facility | ● Coastal or River Port | — Other HDAH Corridors | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



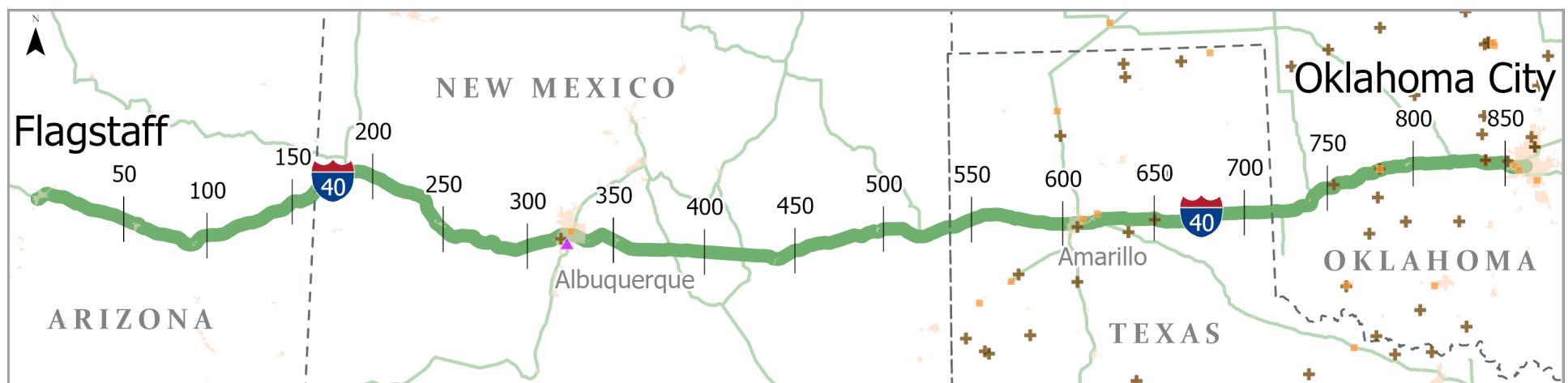
Traffic Direction

— Flagstaff to Oklahoma City

— Oklahoma City to Flagstaff

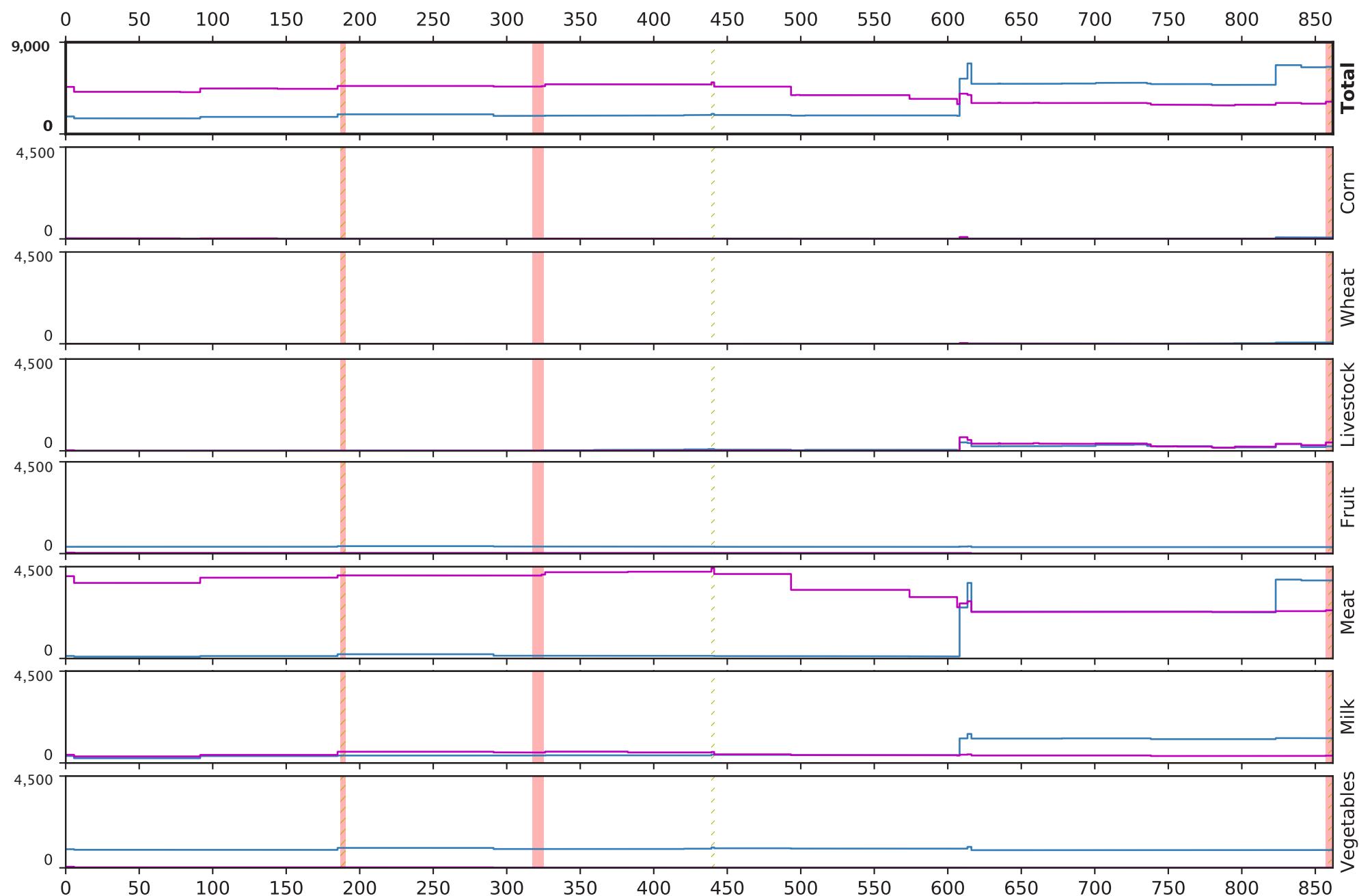
Corridor #6:
Flagstaff, AZ, to Oklahoma City, OK

VALUE (in millions of dollars)



Map Legend

- | | | | |
|----------------------------|----------------------------------------|----------------------------------|------------------------------------|
| + Grain Elevator | Orange Square Meat Processing Facility | Dark Green Analysis Corridor | Light Green Urbanized Area |
| ▲ Intermodal Rail Facility | Blue Circle Coastal or River Port | Light Green Other HDAH Corridors | Vertical Line Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



TTI > 1.2

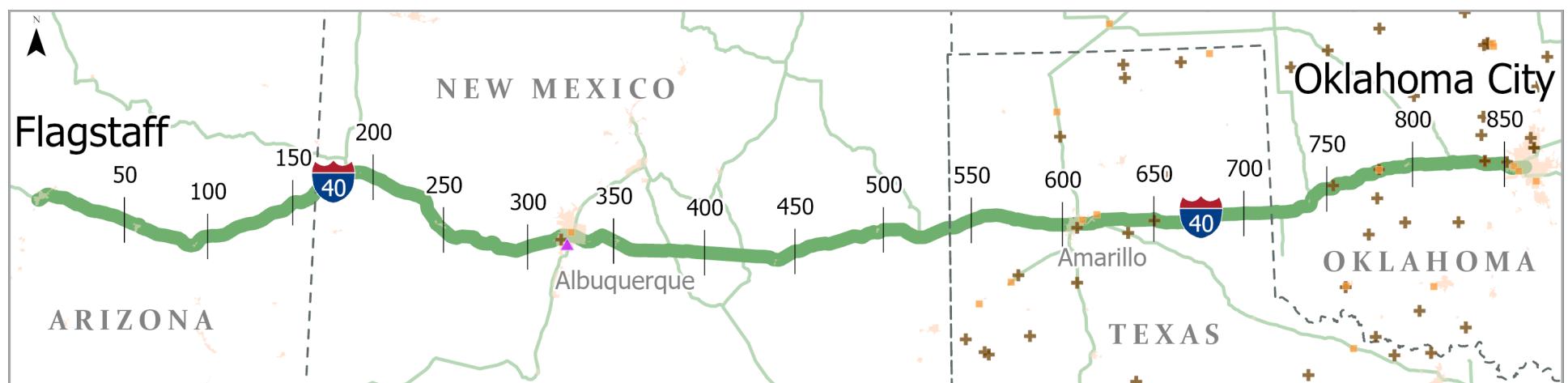
Traffic Direction

— Flagstaff to Oklahoma City

— Oklahoma City to Flagstaff

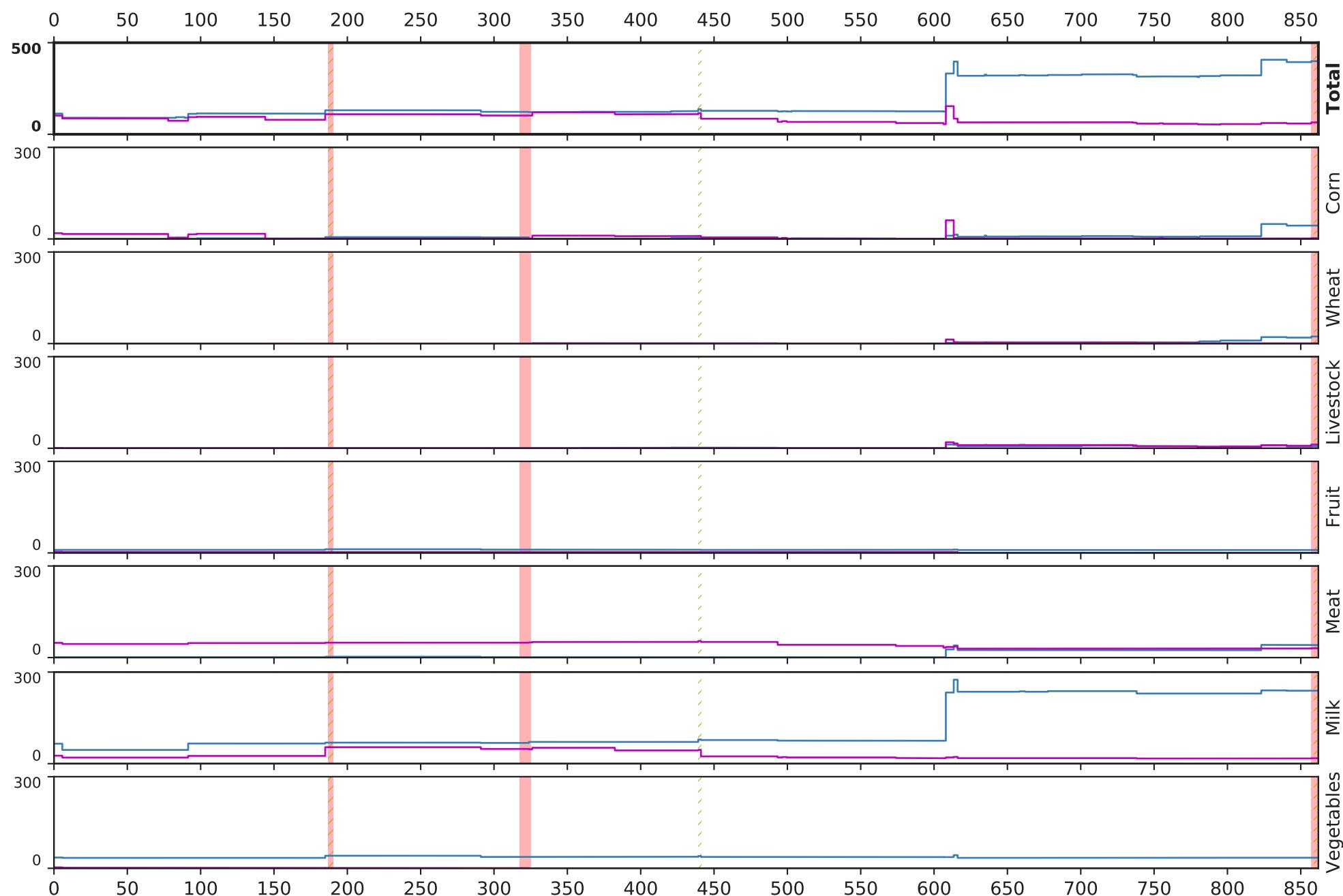
**Corridor #6:
Flagstaff, AZ, to Oklahoma City, OK**

UNITS (in thousands of trucks)



Map Legend

- | | | | |
|----------------------------|----------------------------|------------------------|----------------------|
| + Grain Elevator | ■ Meat Processing Facility | ■ Analysis Corridor | ● Urbanized Area |
| ▲ Intermodal Rail Facility | ● Coastal or River Port | — Other HDAH Corridors | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



Traffic Direction

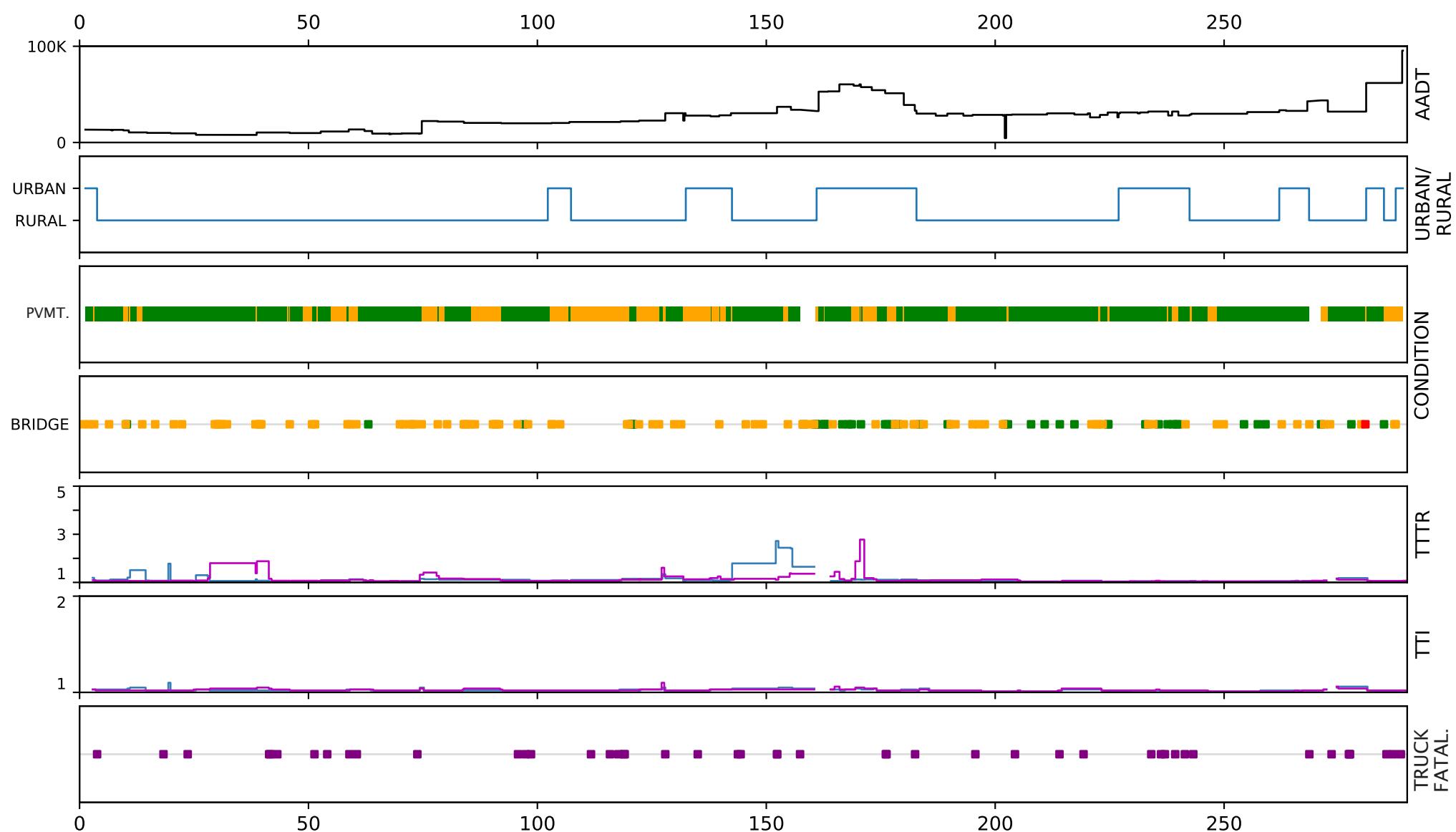
— Flagstaff to Oklahoma City

— Oklahoma City to Flagstaff



Map Legend

- + Grain Elevator
- Meat Processing Facility
- ▲ Intermodal Rail Facility
- Coastal or River Port
- Analysis Corridor
- Other HDAH Corridors
- Urbanized Area
- | Corridor Mile Marker



DATA LEGEND

Congestion and Reliability

TTI > 1.2

TTTR > 2.0

Bridge and Pavement (PVMT) Condition

■ "Good" Condition

■ "Fair" Condition

■ "Poor" Condition

Traffic Direction (TTTR/TTI)

— Florence to Jacksonville

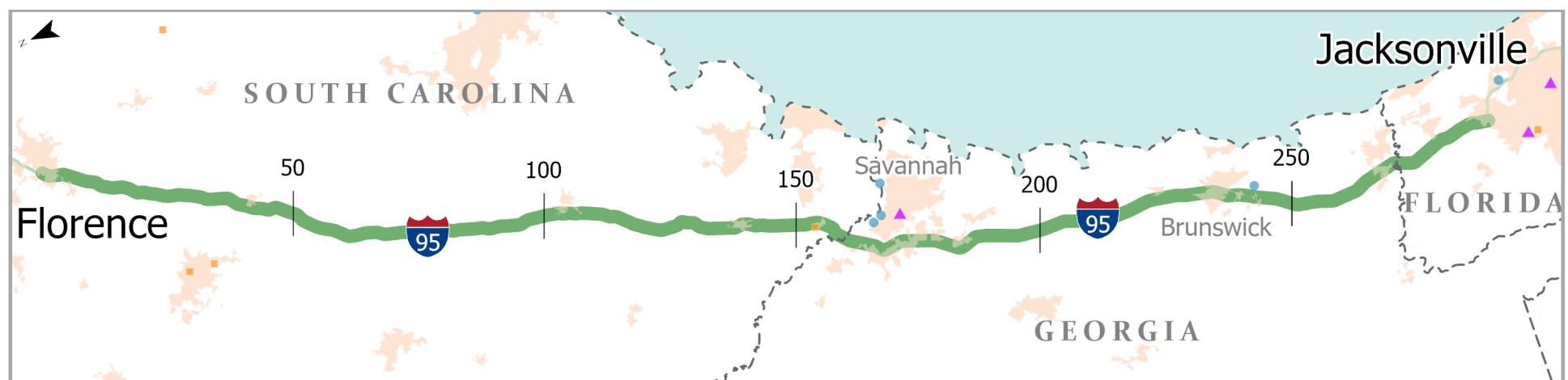
— Jacksonville to Florence

Safety

■ 1 fatality involving a truck, 2014 - 2018

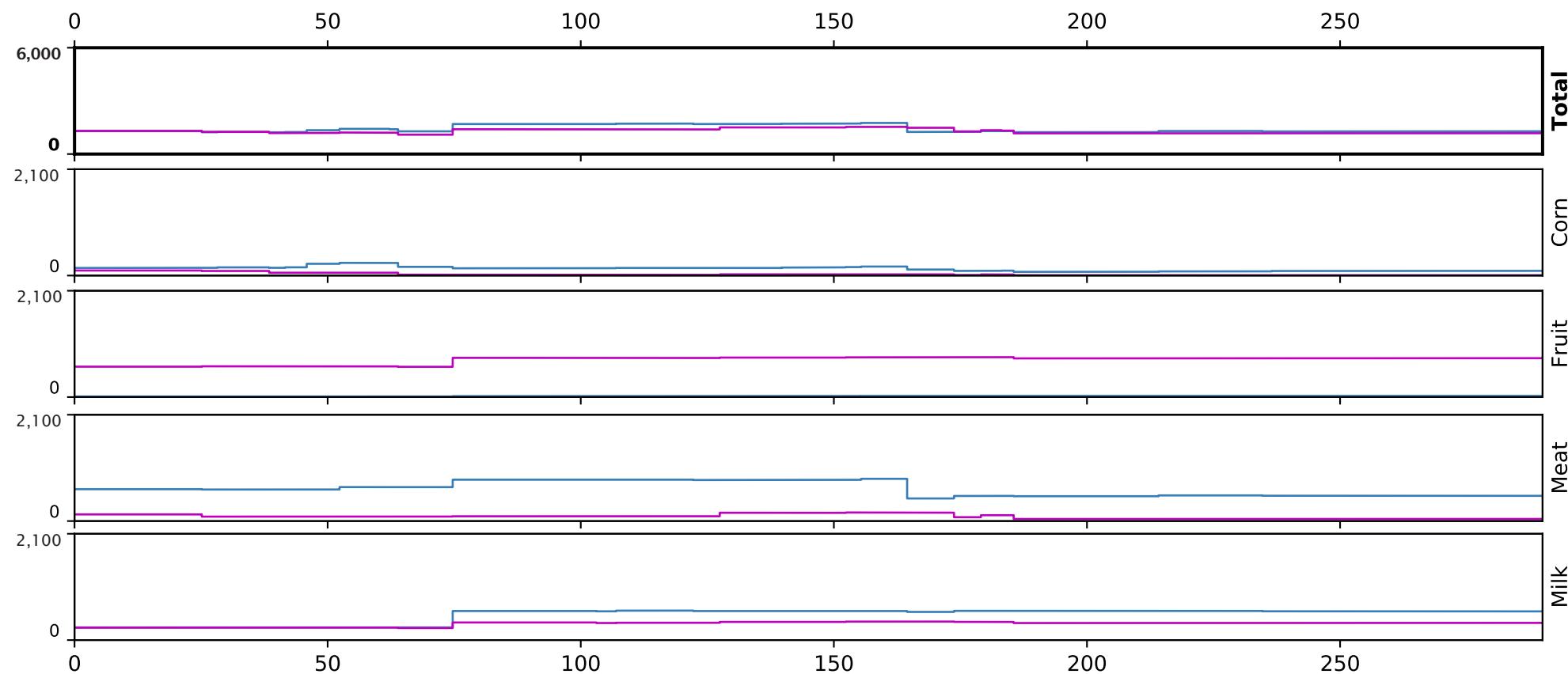
Corridor #7:
Florence, SC, to Jacksonville, FL

TONNAGE (in millions of tons)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



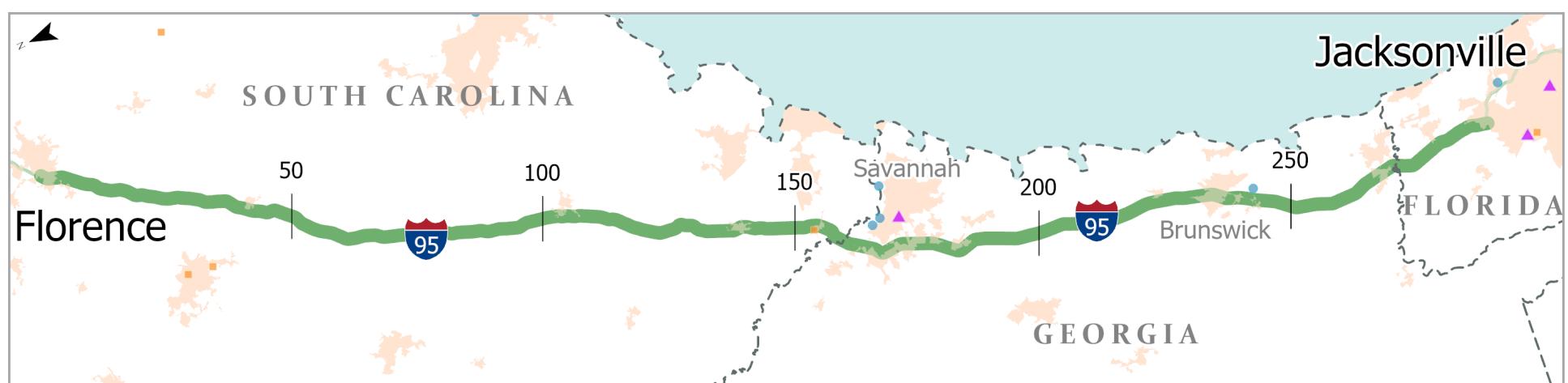
Traffic Direction

— Florence to Jacksonville

— Jacksonville to Florence

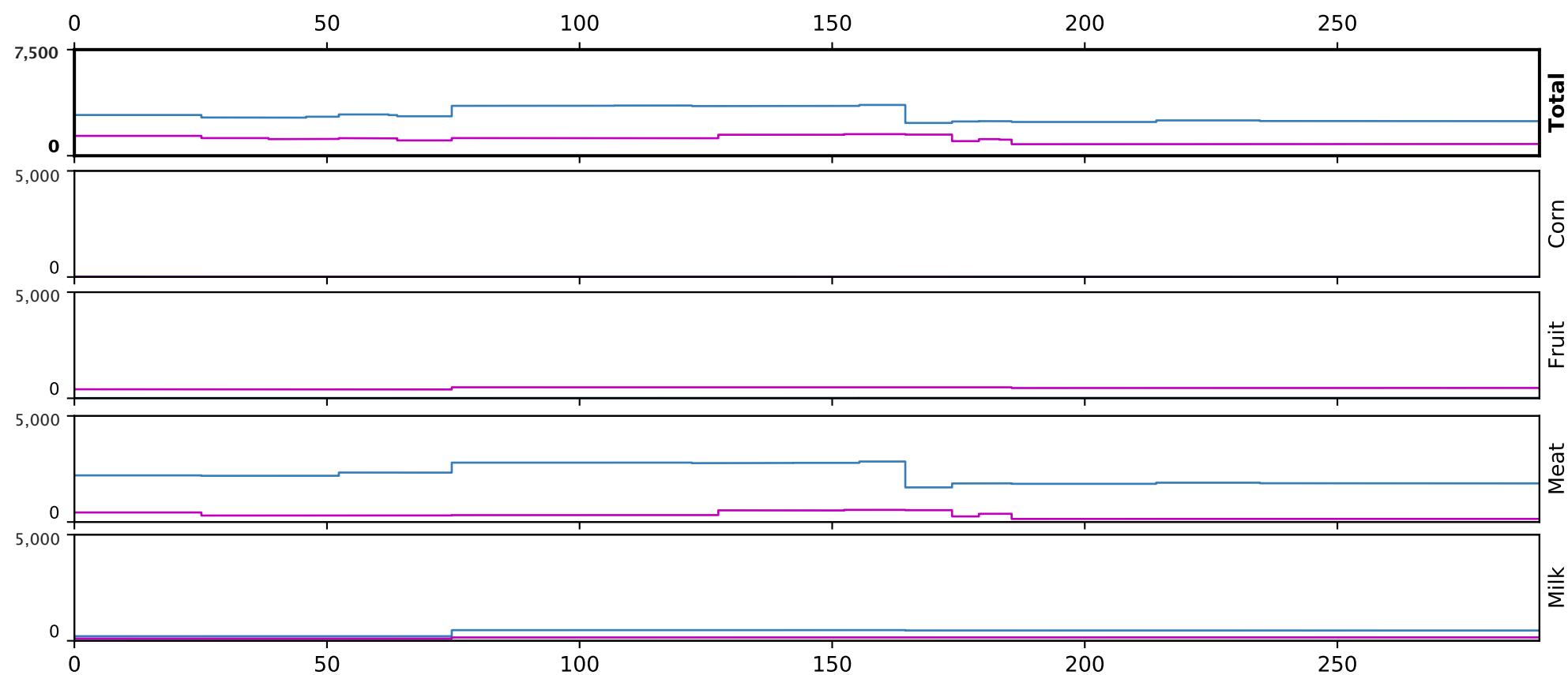
Corridor #7:
Florence, SC, to Jacksonville, FL

VALUE (in millions of dollars)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



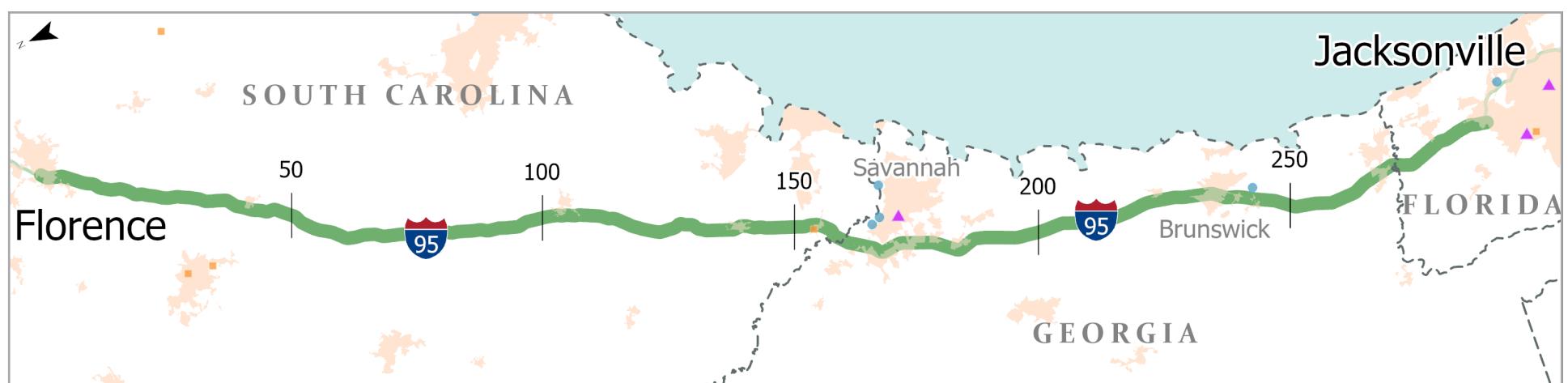
Traffic Direction

— Florence to Jacksonville

— Jacksonville to Florence

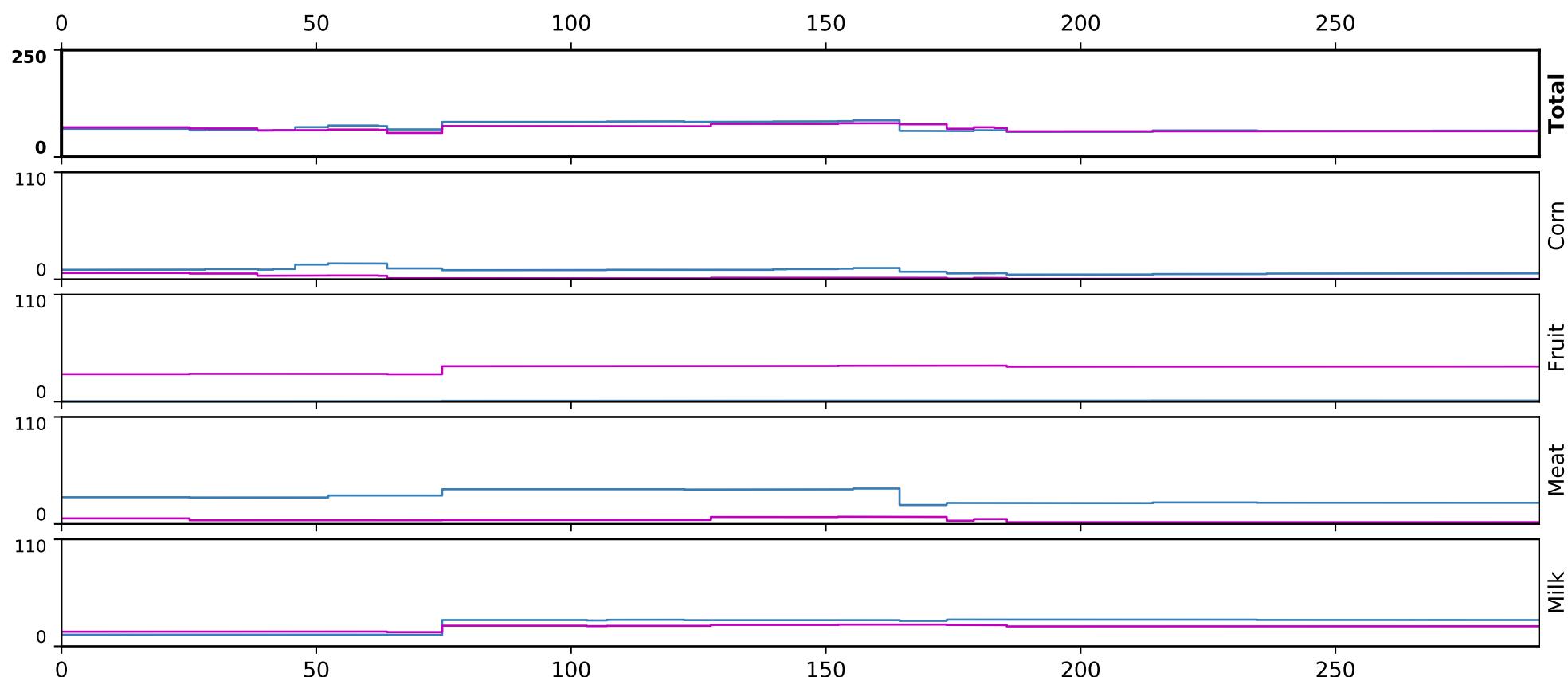
Corridor #7:
Florence, SC, to Jacksonville, FL

UNITS (in thousands of trucks)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



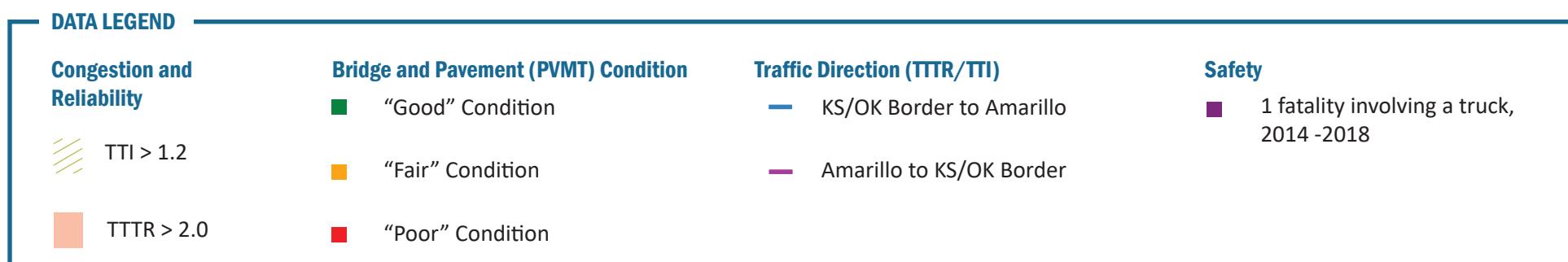
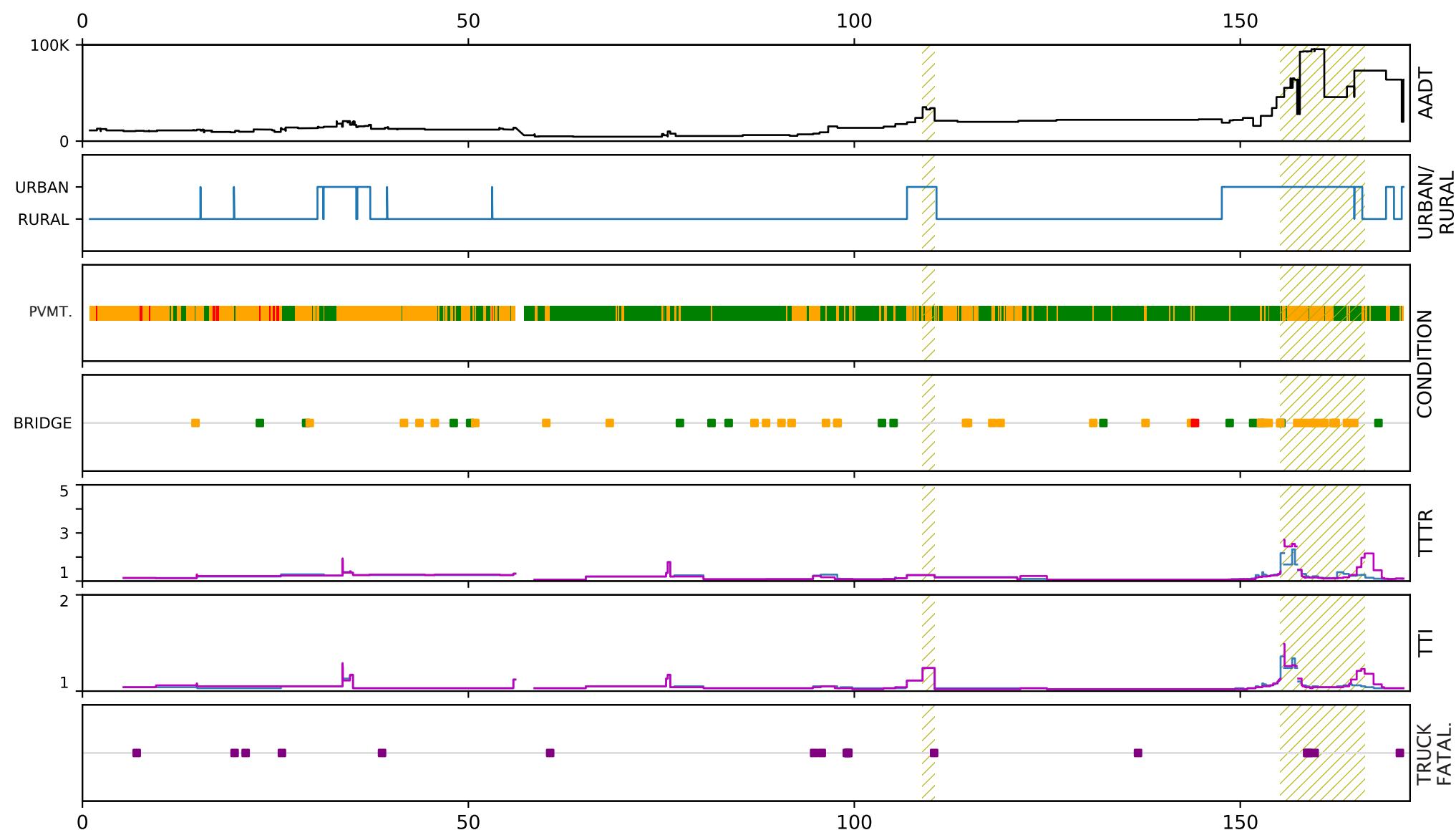
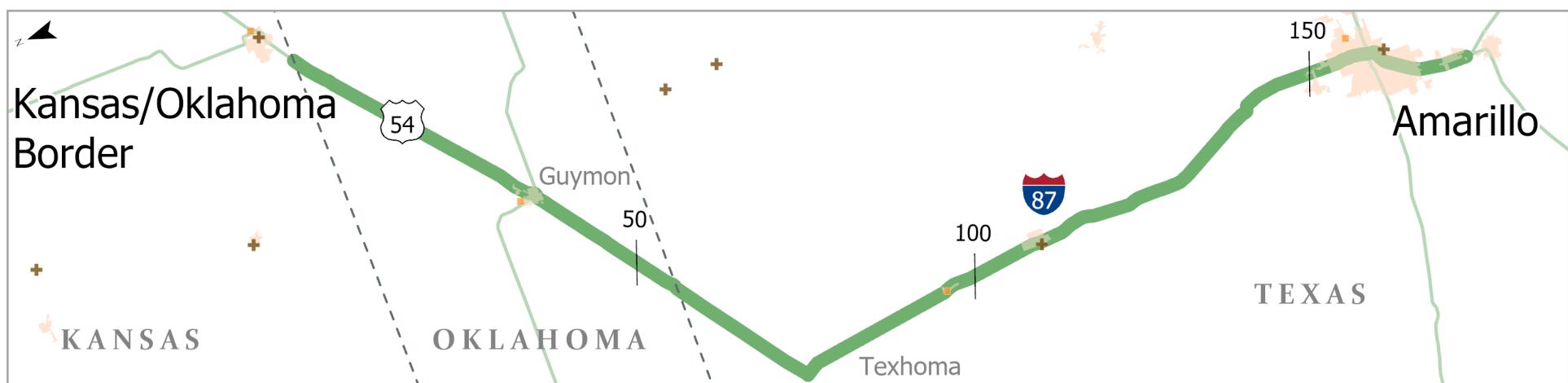
Traffic Direction

— Florence to Jacksonville

— Jacksonville to Florence

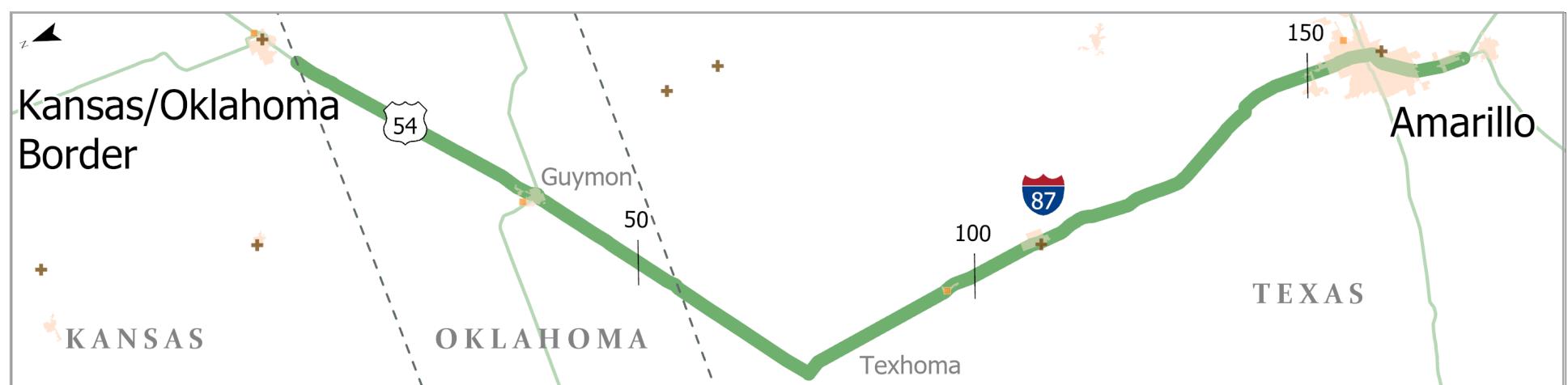
Corridor #8:
Kansas/Oklahoma Border to Amarillo, TX

CONDITIONS & PERFORMANCE



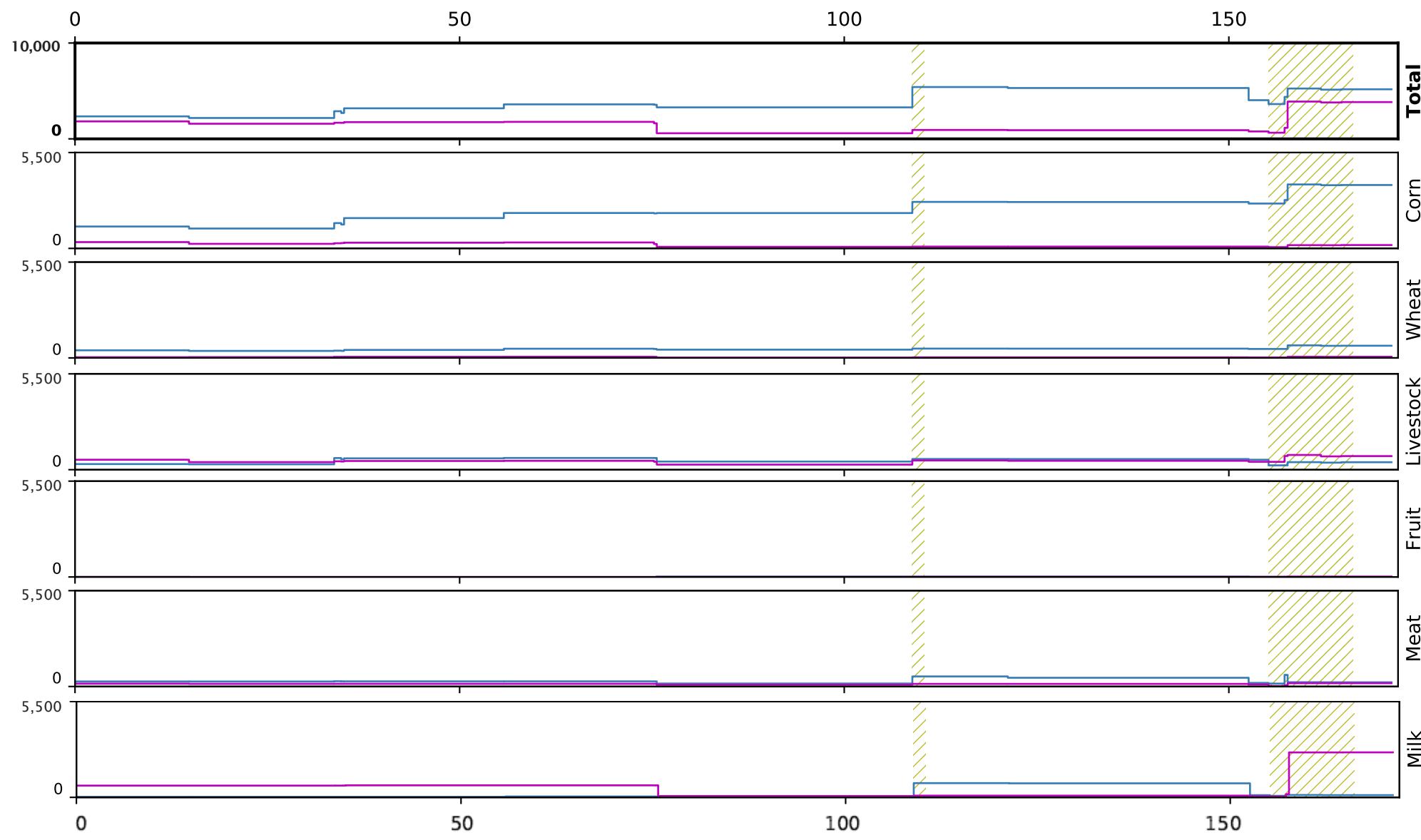
**Corridor #8:
Kansas/Oklahoma Border to Amarillo, TX**

TONNAGE (in millions of tons)



Map Legend

- | | | | |
|----------------------------|----------------------------|------------------------|----------------------|
| + Grain Elevator | ■ Meat Processing Facility | ■ Analysis Corridor | ● Urbanized Area |
| ▲ Intermodal Rail Facility | ● Coastal or River Port | — Other HDAH Corridors | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



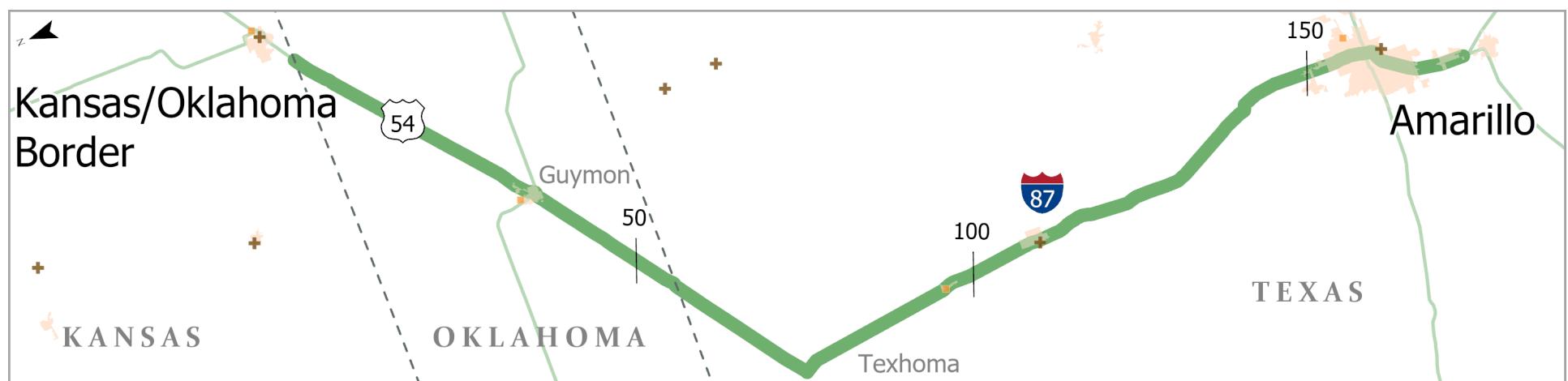
Traffic Direction

— KS/OK Border to Amarillo

— Amarillo to KS/OK Border

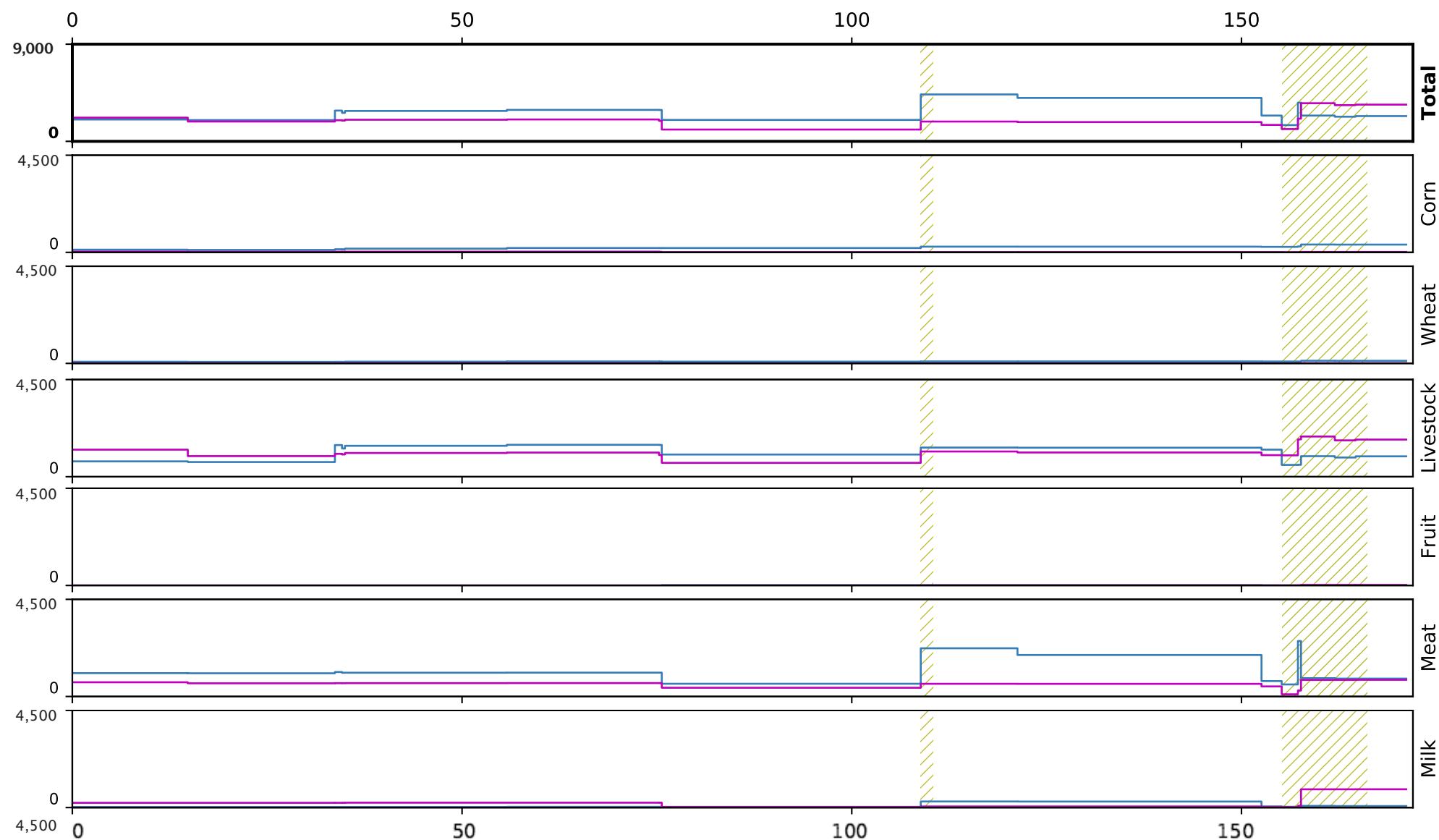
Corridor #8:
Kansas/Oklahoma Border to Amarillo, TX

VALUE (in millions of dollars)



Map Legend

- + Grain Elevator
- Meat Processing Facility
- Analysis Corridor
- Urbanized Area
- ▲ Intermodal Rail Facility
- Coastal or River Port
- Other HDAH Corridors
- | Corridor Mile Marker



DATA LEGEND

Congestion and Reliability



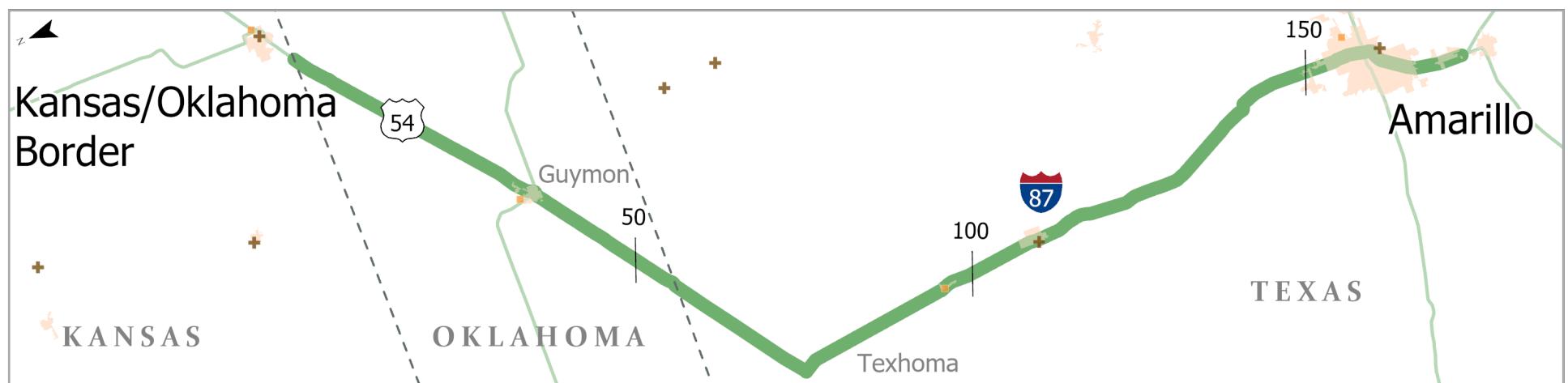
Traffic Direction

— KS/OK Border to Amarillo

— Amarillo to KS/OK Border

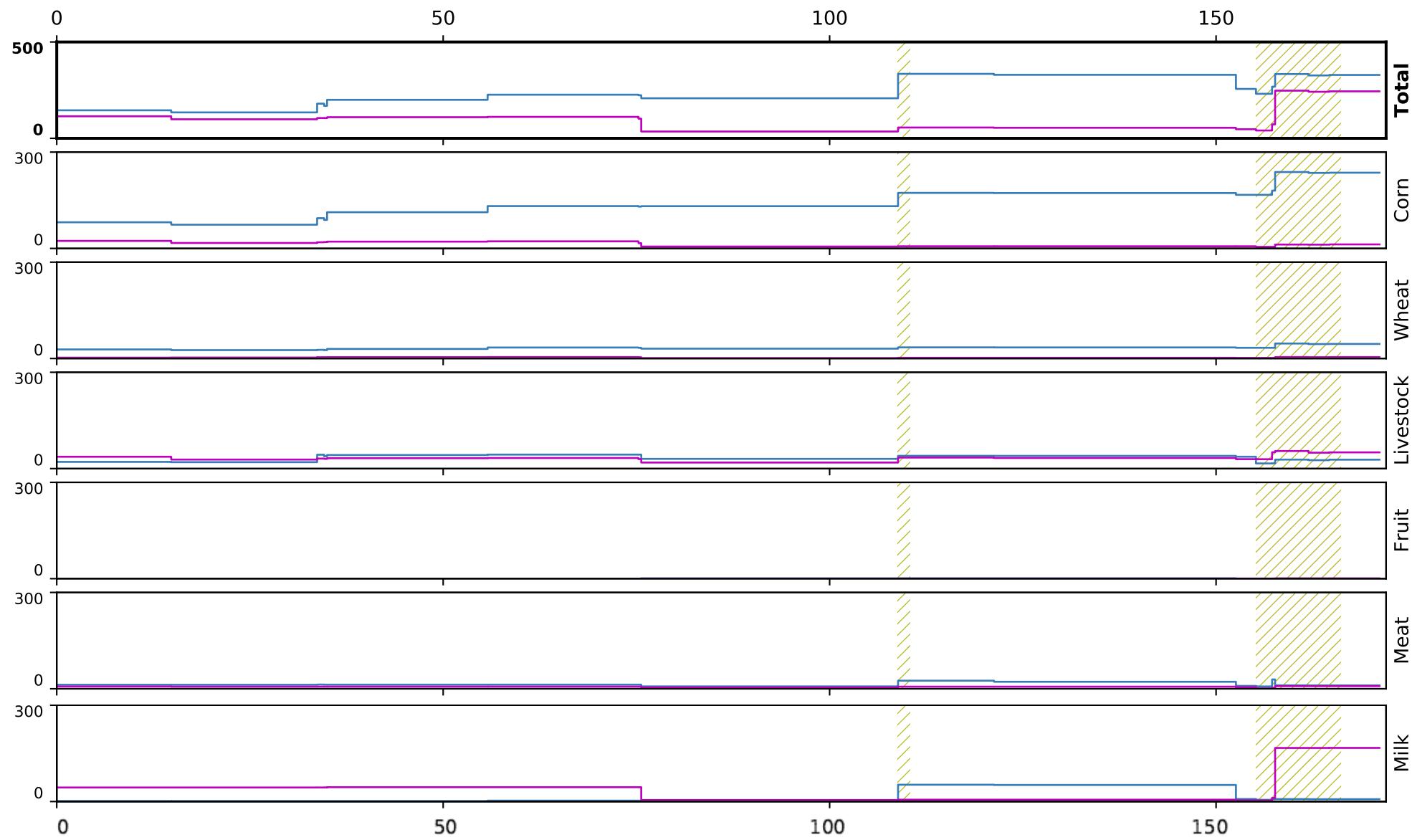
**Corridor #8:
Kansas/Oklahoma Border to Amarillo, TX**

UNITS (in thousands of trucks)



Map Legend

- | | | | |
|----------------------------|----------------------------|------------------------|----------------------|
| + Grain Elevator | ■ Meat Processing Facility | ■ Analysis Corridor | ● Urbanized Area |
| ▲ Intermodal Rail Facility | ● Coastal or River Port | — Other HDAH Corridors | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability

TTI > 1.2

TTTR > 2.0

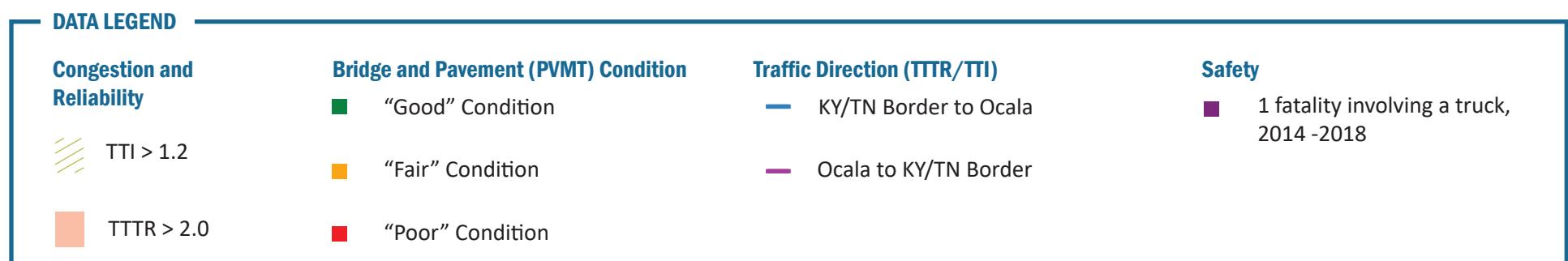
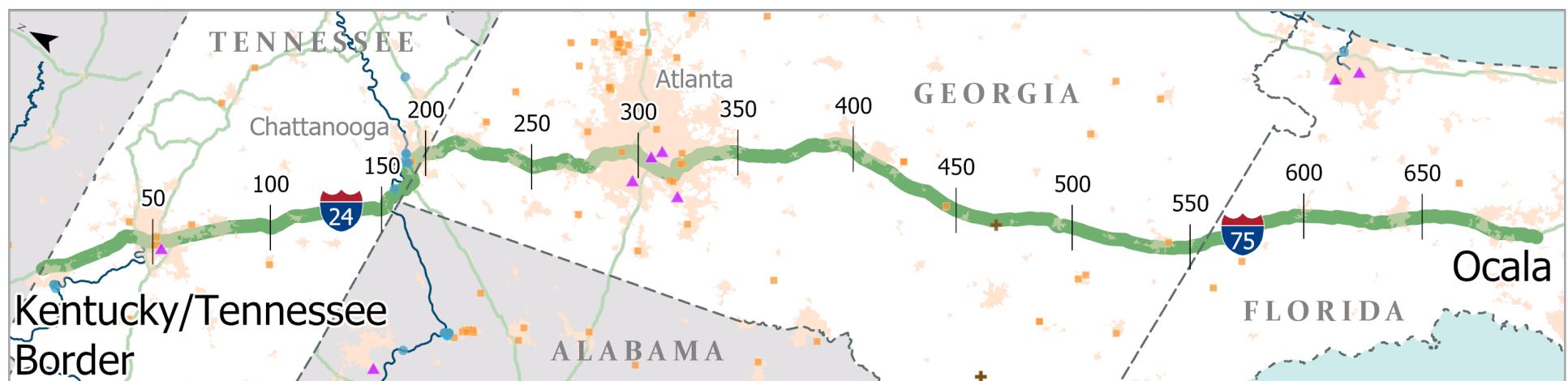
Traffic Direction

— KS/OK Border to Amarillo

— Amarillo to KS/OK Border

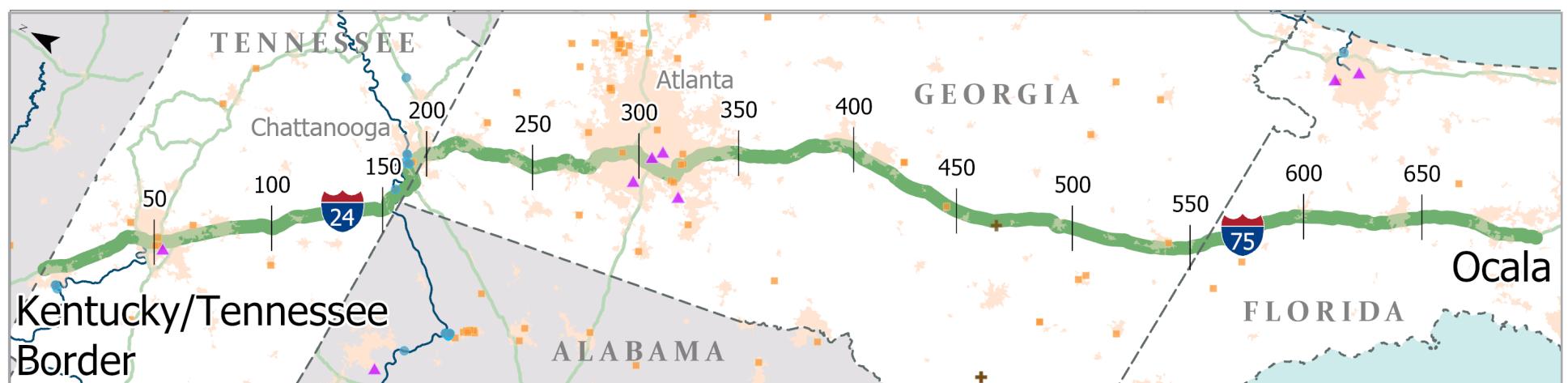
Corridor #9:
Kentucky/Tennessee Border to Ocala, FL

CONDITIONS & PERFORMANCE



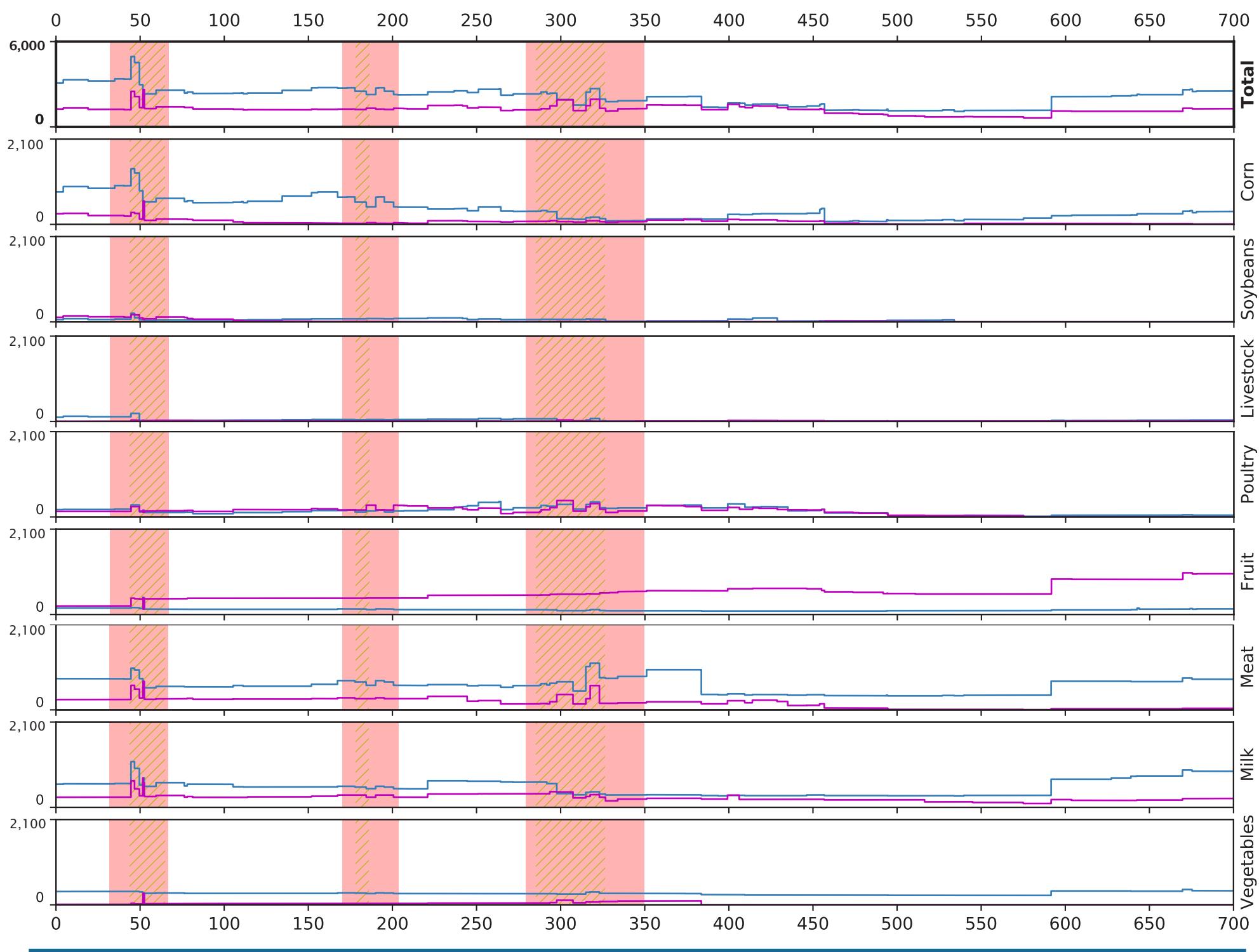
Corridor #9:
Kentucky/Tennessee Border to Ocala, FL

TONNAGE (in millions of tons)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



TTI > 1.2

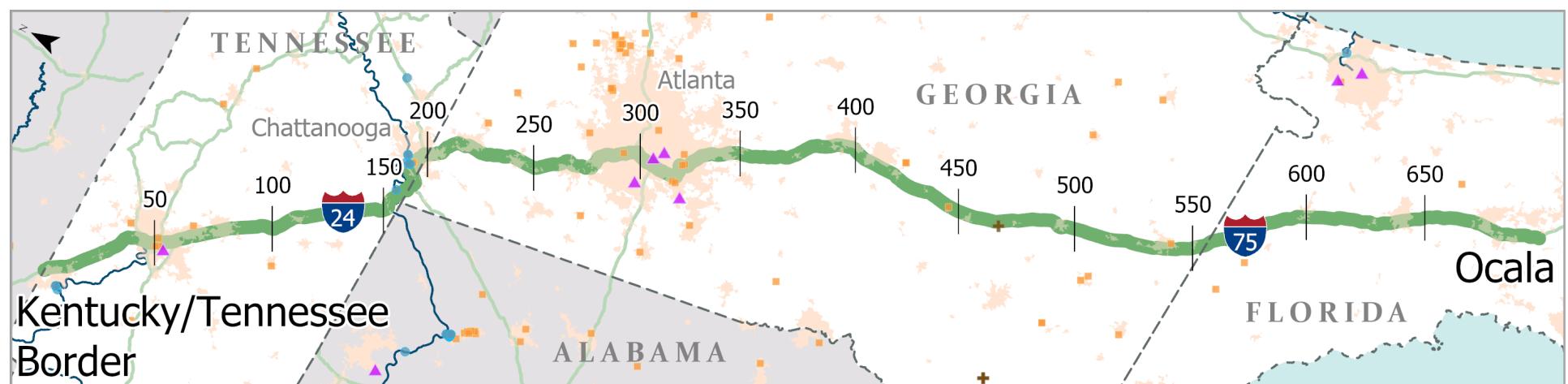
TTTR > 2.0

KY/TN Border to Ocala

Ocala to KY/TN Border

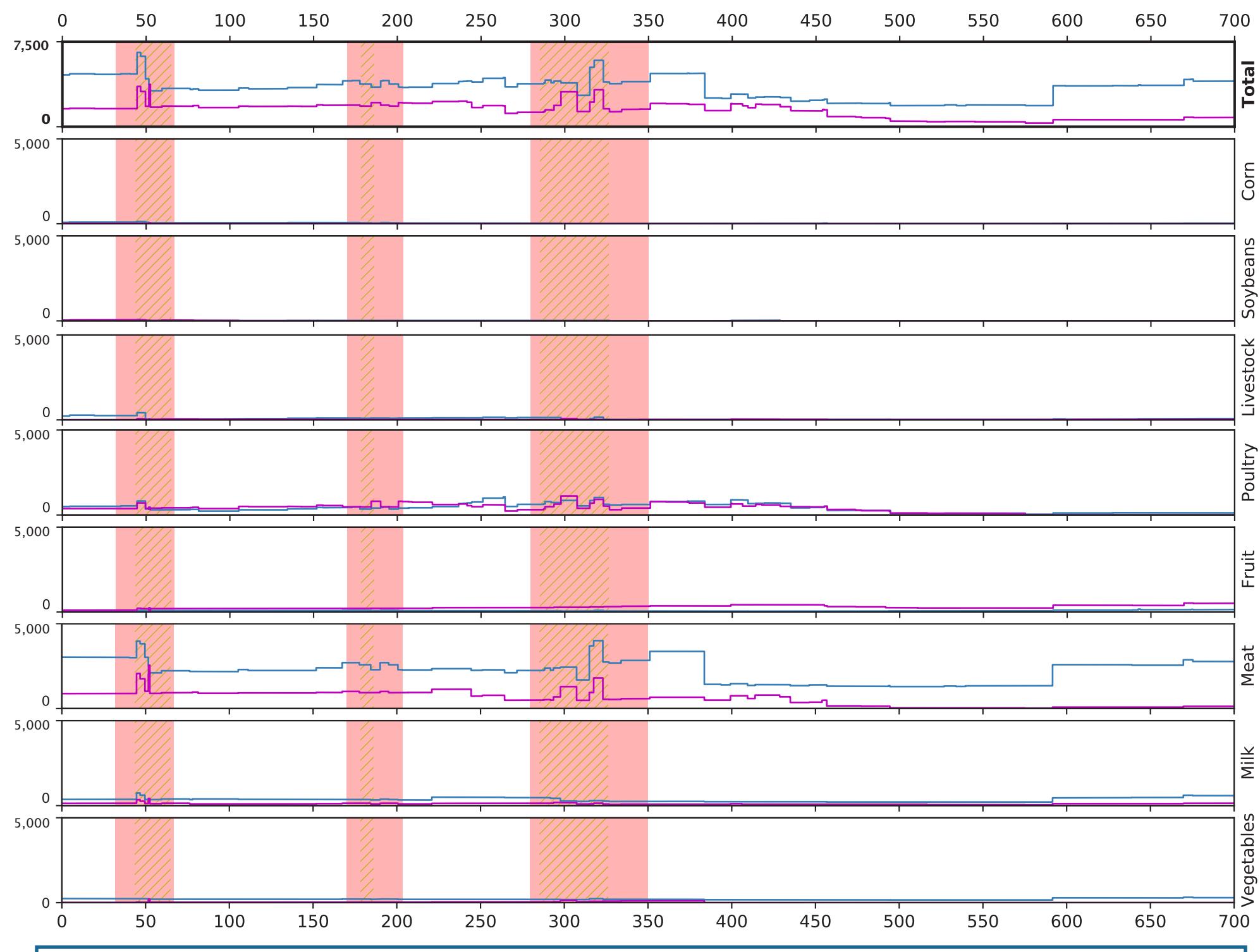
Corridor #9:
Kentucky/Tennessee Border to Ocala, FL

VALUE (in millions of dollars)



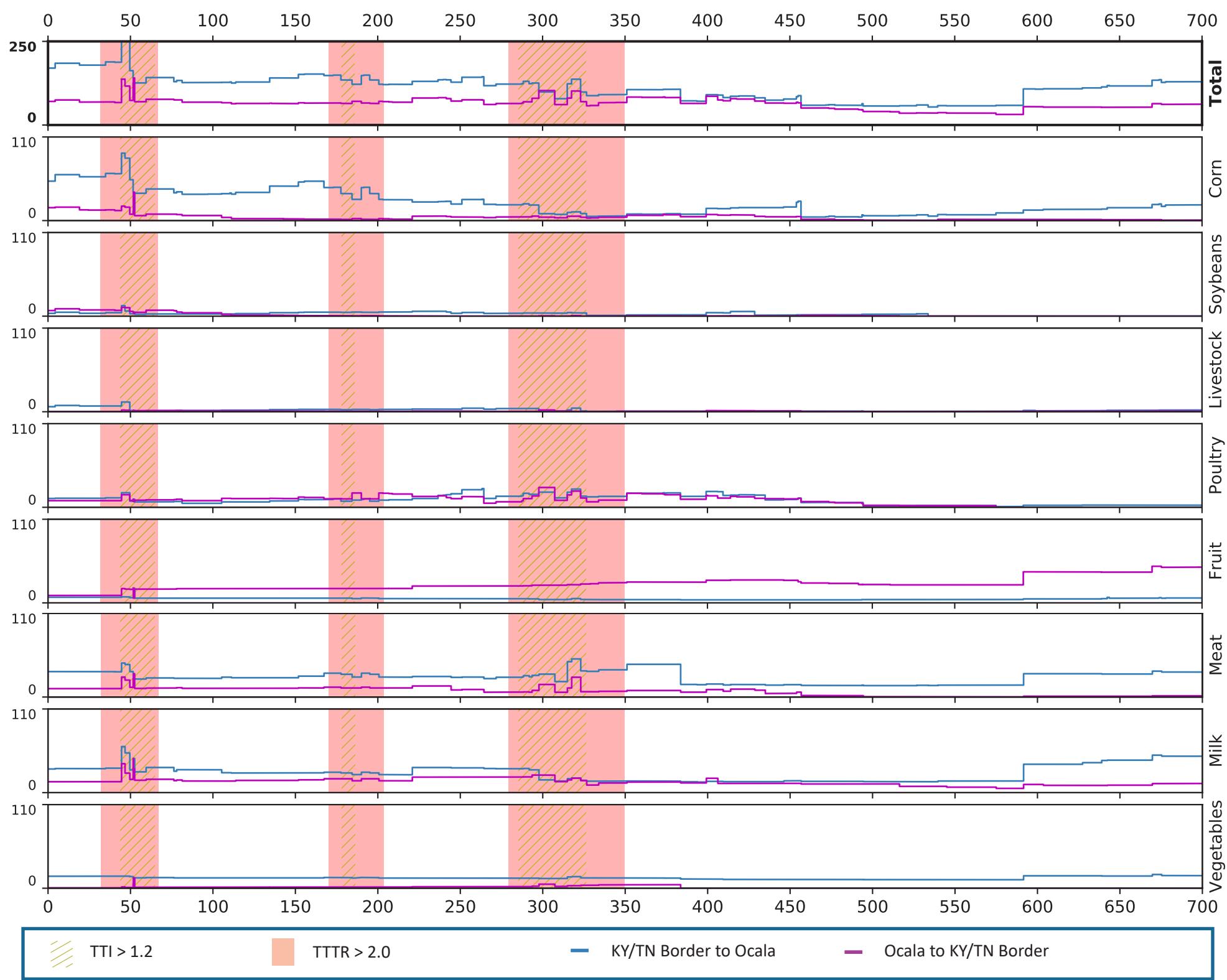
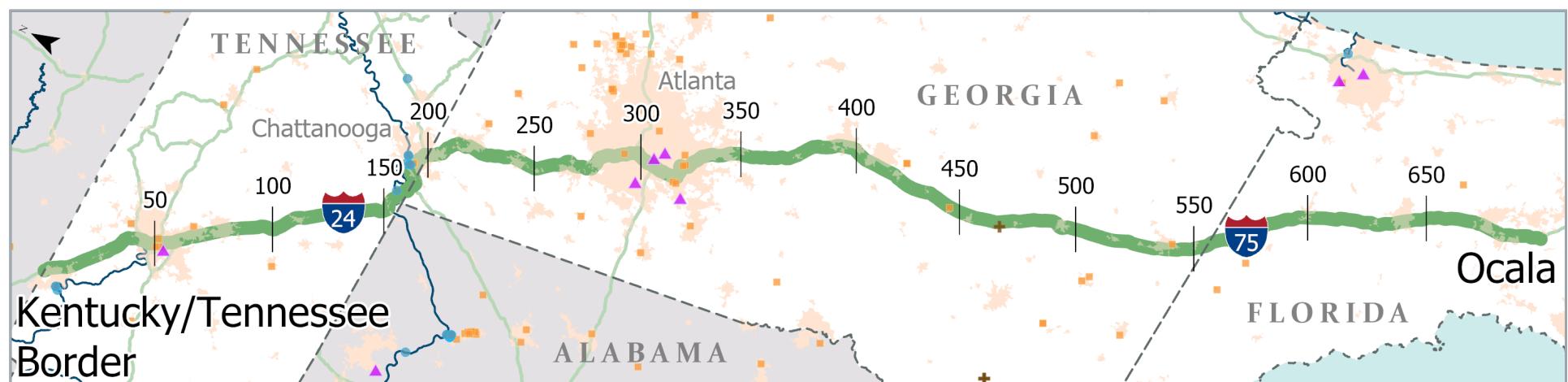
Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | — | Meat Processing Facility | — | Analysis Corridor | — | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



Corridor #9:
Kentucky/Tennessee Border to Ocala, FL

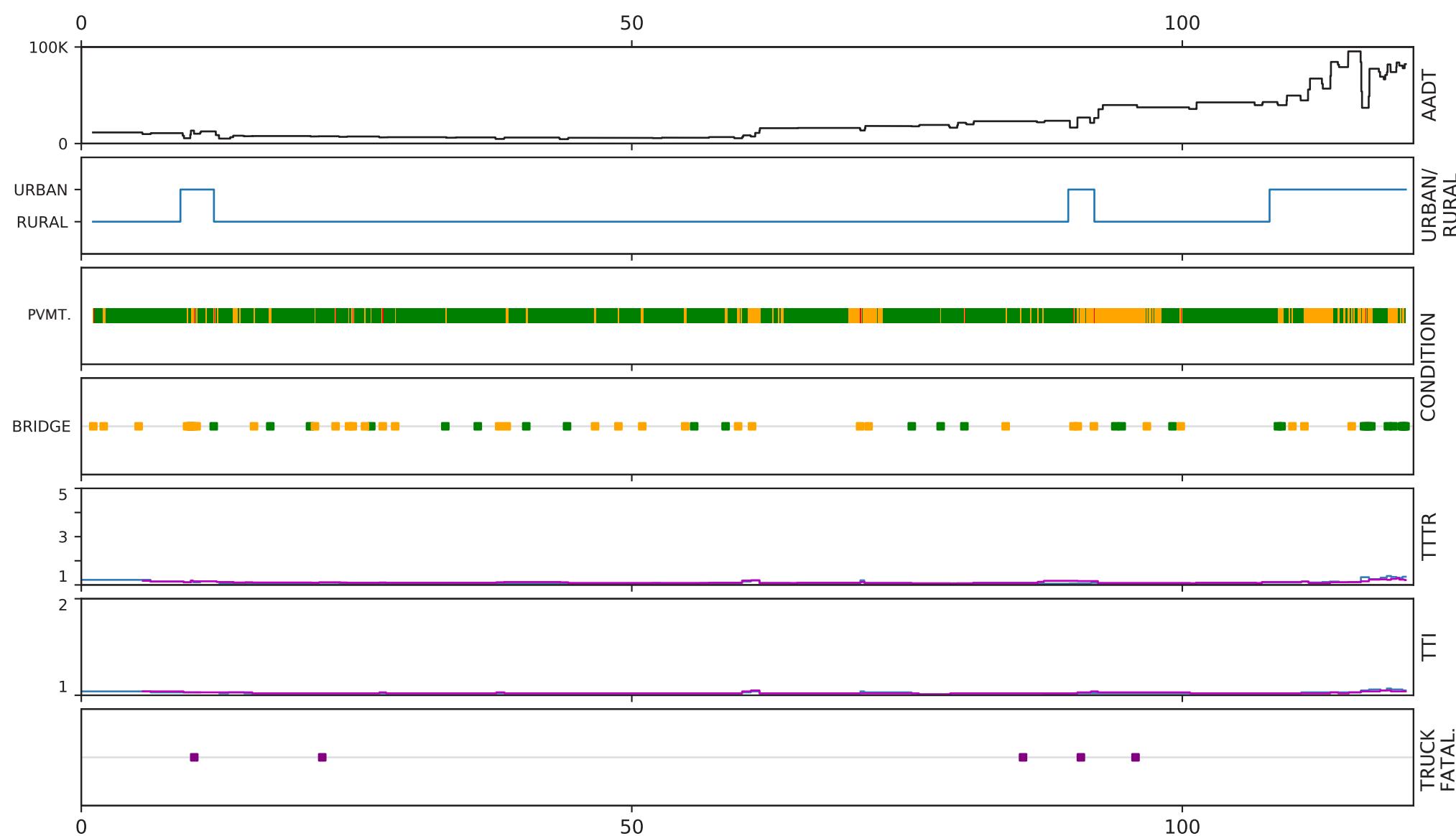
UNITS (in thousands of trucks)





Map Legend

- + Grain Elevator
- Meat Processing Facility
- Analysis Corridor
- Urbanized Area
- ▲ Intermodal Rail Facility
- Coastal or River Port
- Other HDAH Corridors
- | Corridor Mile Marker



DATA LEGEND

Congestion and Reliability

TTI > 1.2

TTTR > 2.0

Bridge and Pavement (PVMT) Condition

■ "Good" Condition

■ "Fair" Condition

■ "Poor" Condition

Traffic Direction (TTTR/TI)

— Mason City to Des Moines

— Des Moines to Mason City

Safety

■ 1 fatality involving a truck, 2014 - 2018

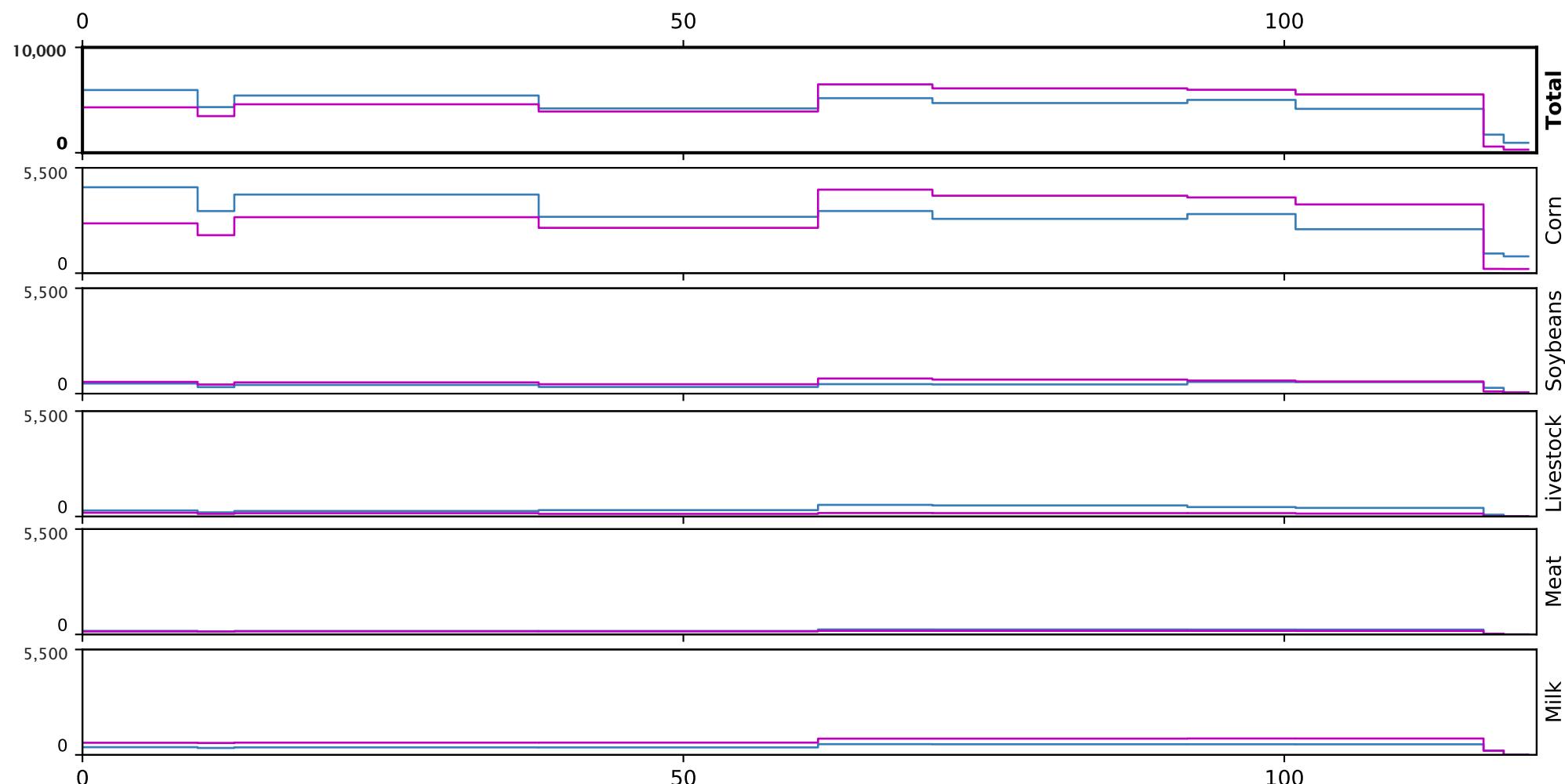
**Corridor #10:
Mason City, IA, to Des Moines, IA**

TONNAGE (in millions of tons)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



Traffic Direction

— Mason City to Des Moines

— Des Moines to Mason City

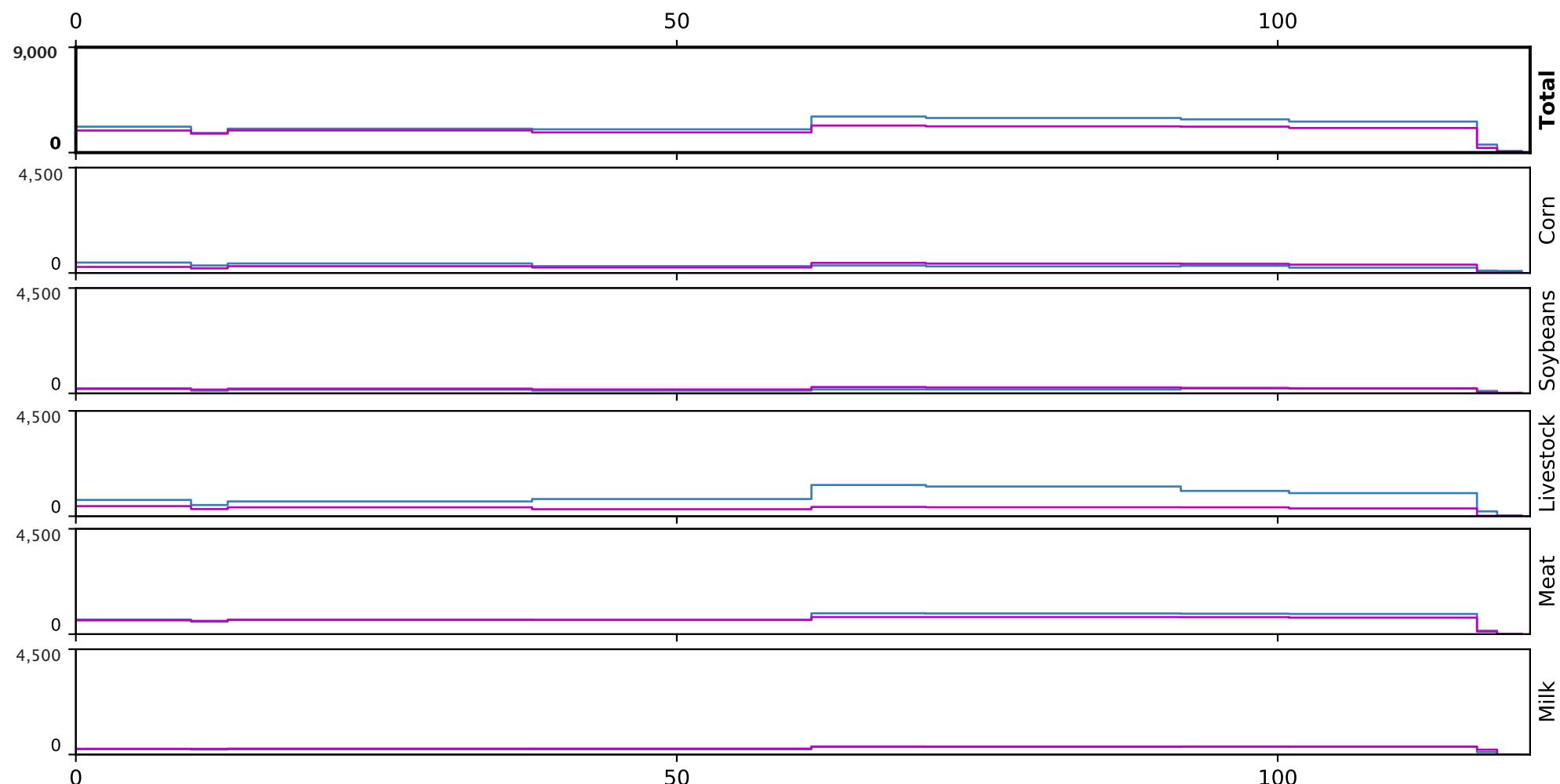
**Corridor #10:
Mason City, IA, to Des Moines, IA**

VALUE (in millions of dollars)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



Traffic Direction

— Mason City to Des Moines

— Des Moines to Mason City

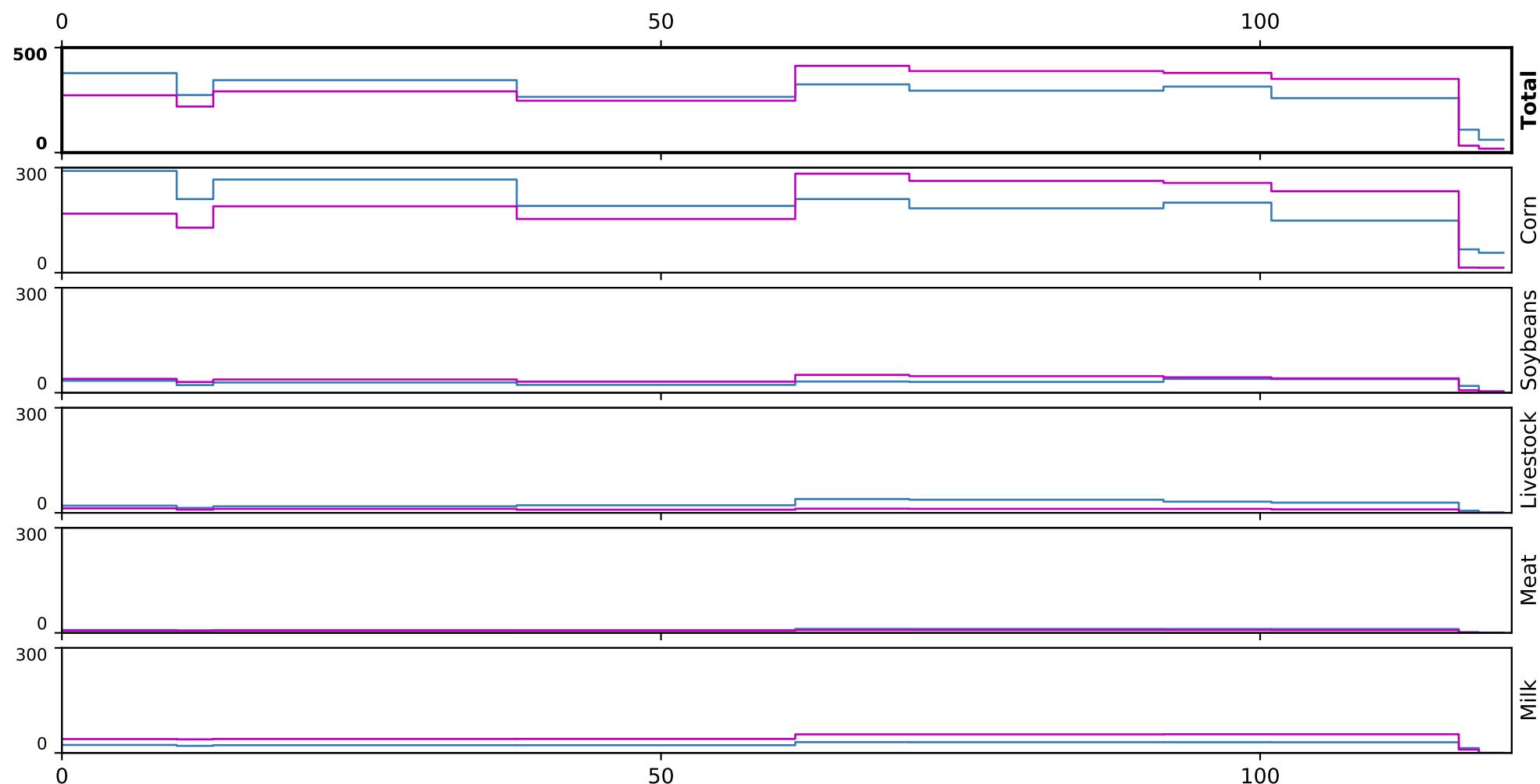
**Corridor #10:
Mason City, IA, to Des Moines, IA**

UNITS (in thousands of trucks)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



DATA LEGEND

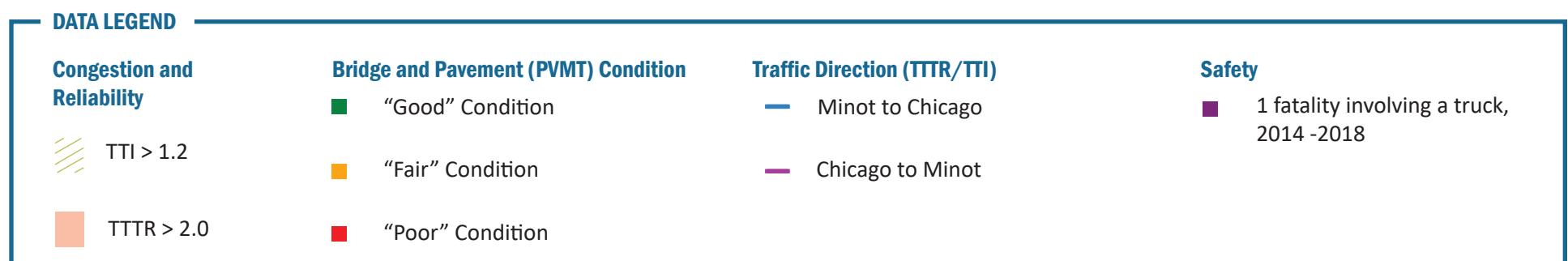
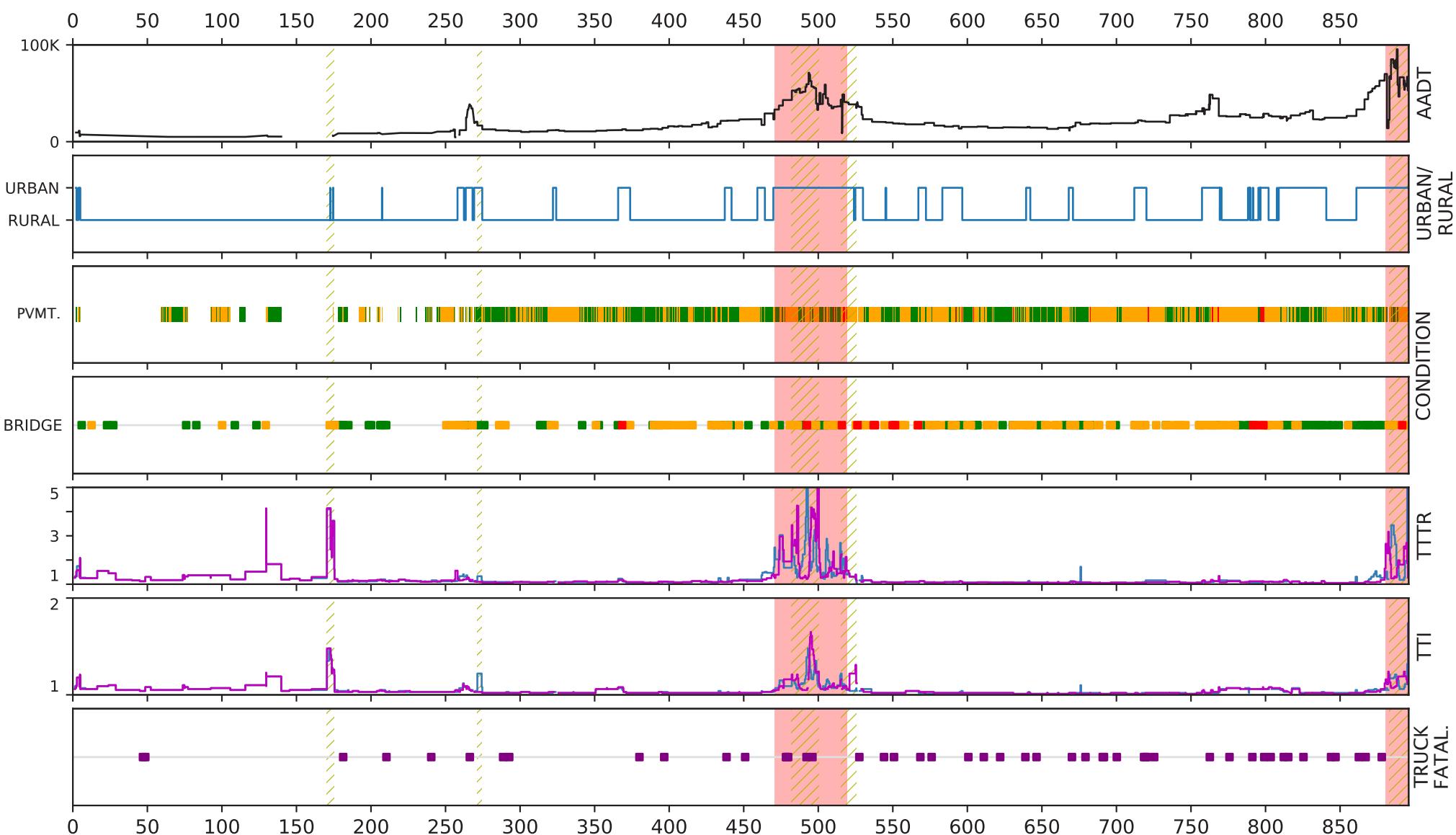
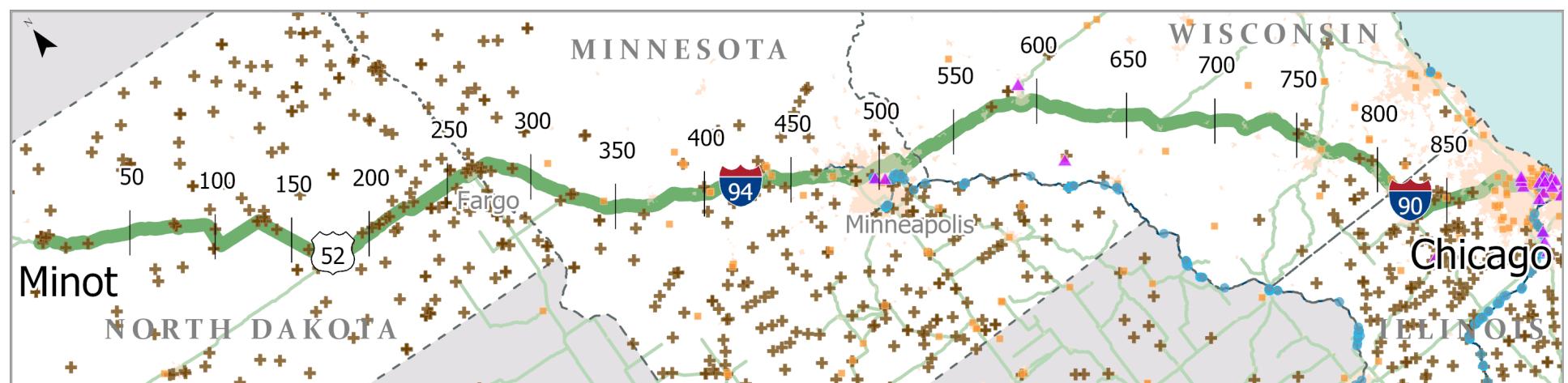
Congestion and Reliability



Traffic Direction

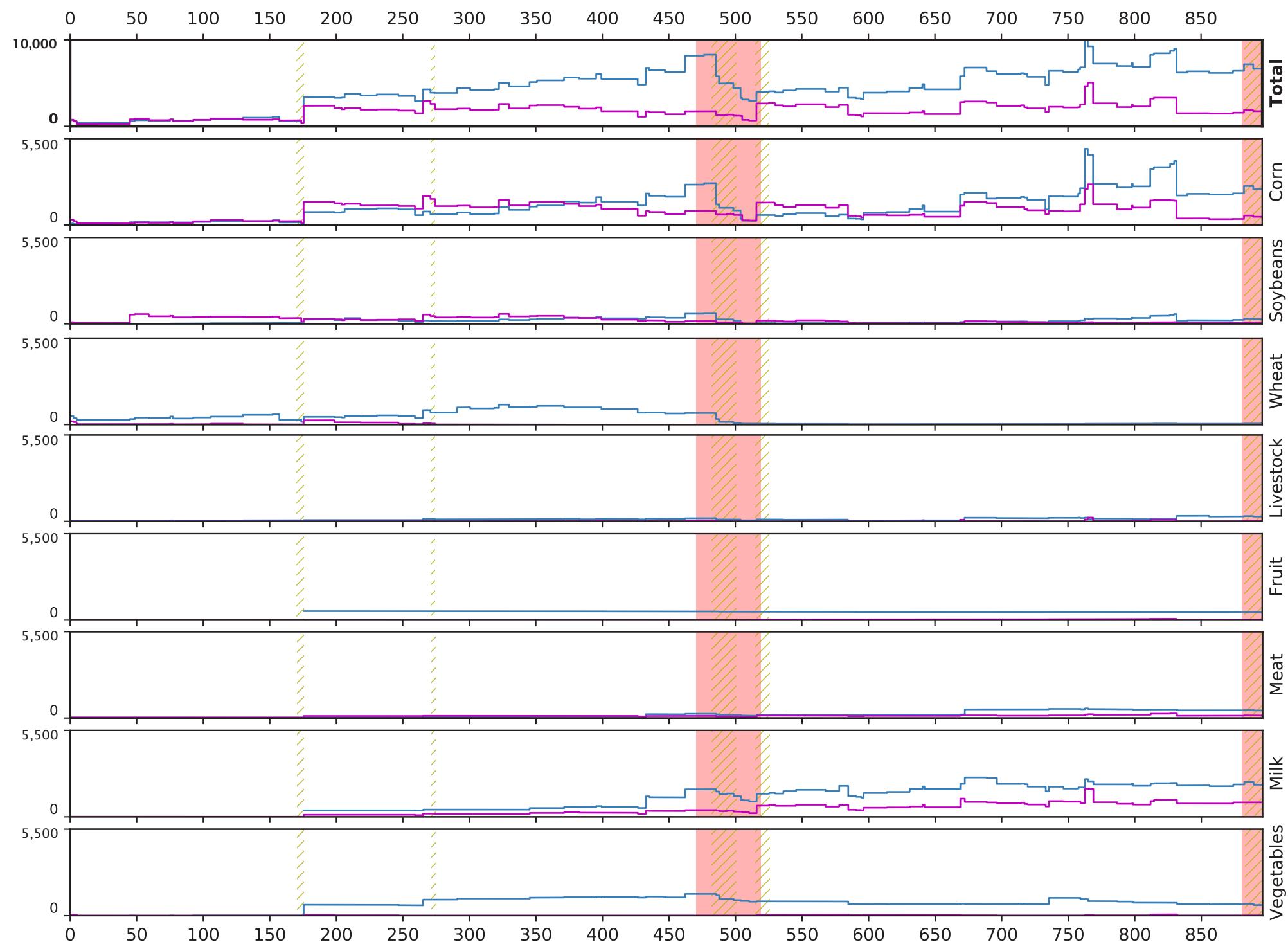
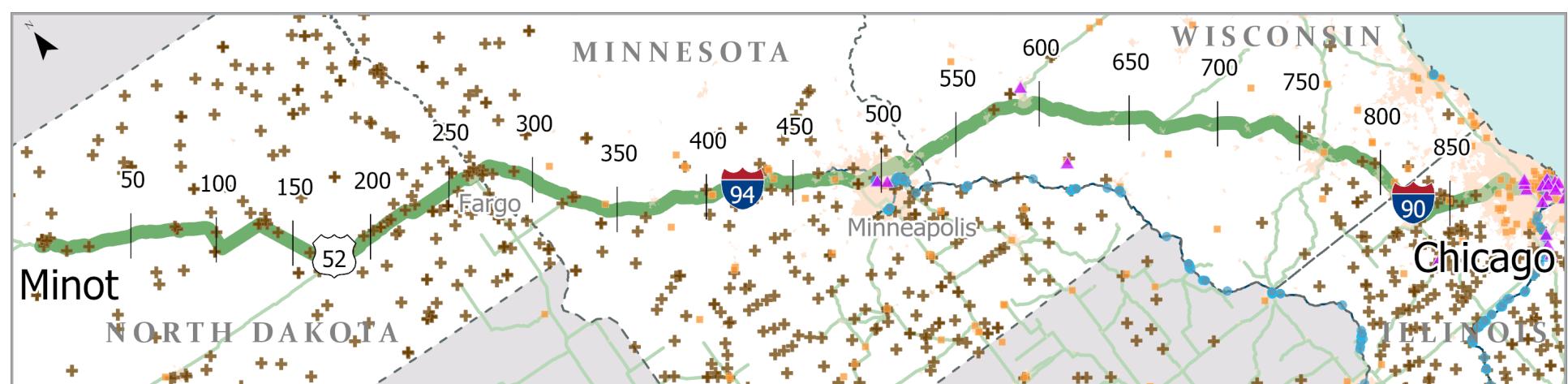
— Mason City to Des Moines

— Des Moines to Mason City



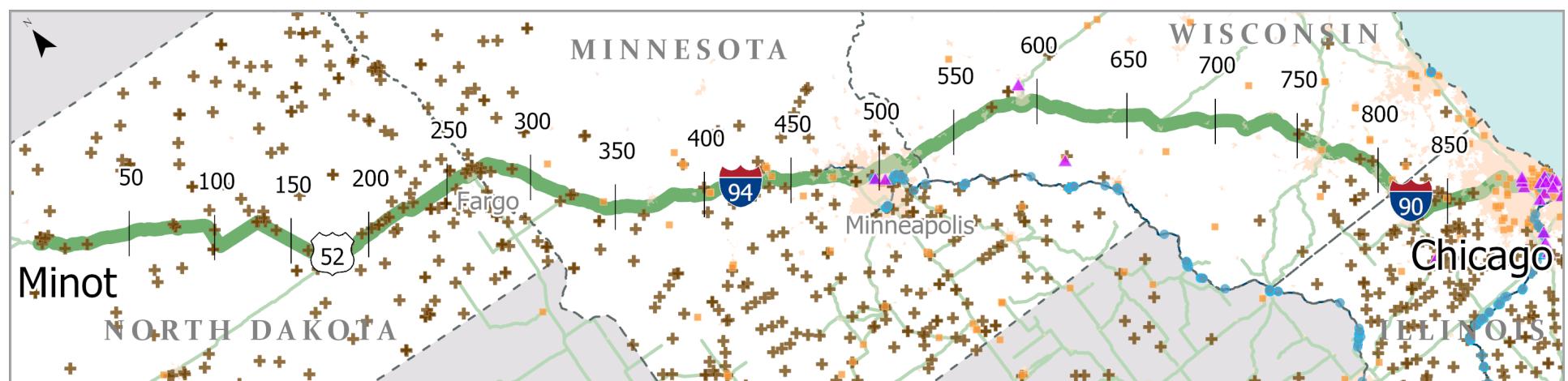
Corridor #11:
Minot, ND, to Chicago, IL

TONNAGE (in millions of tons)



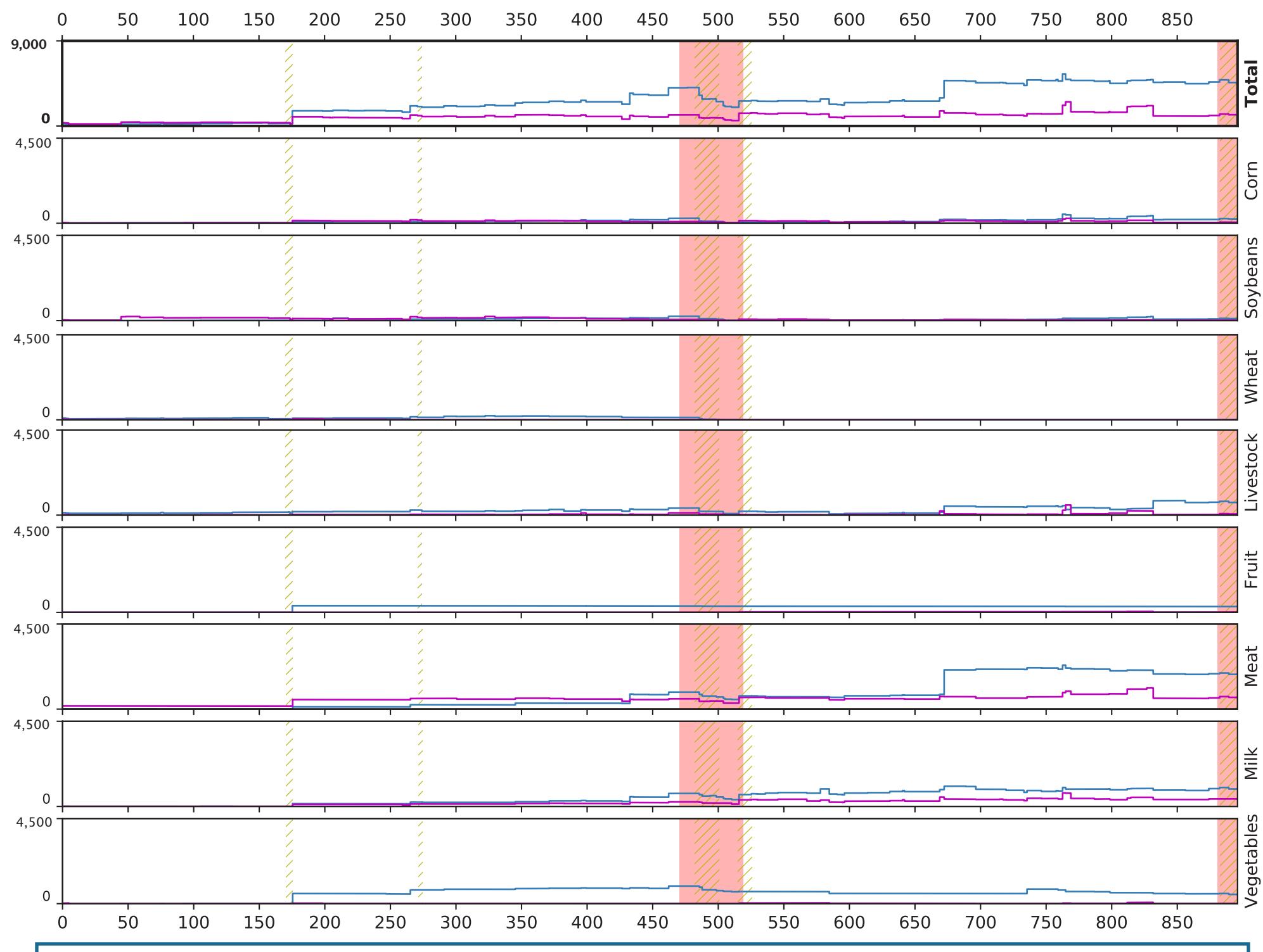
Corridor #11:
Minot, ND, to Chicago, IL

VALUE (in millions of dollars)



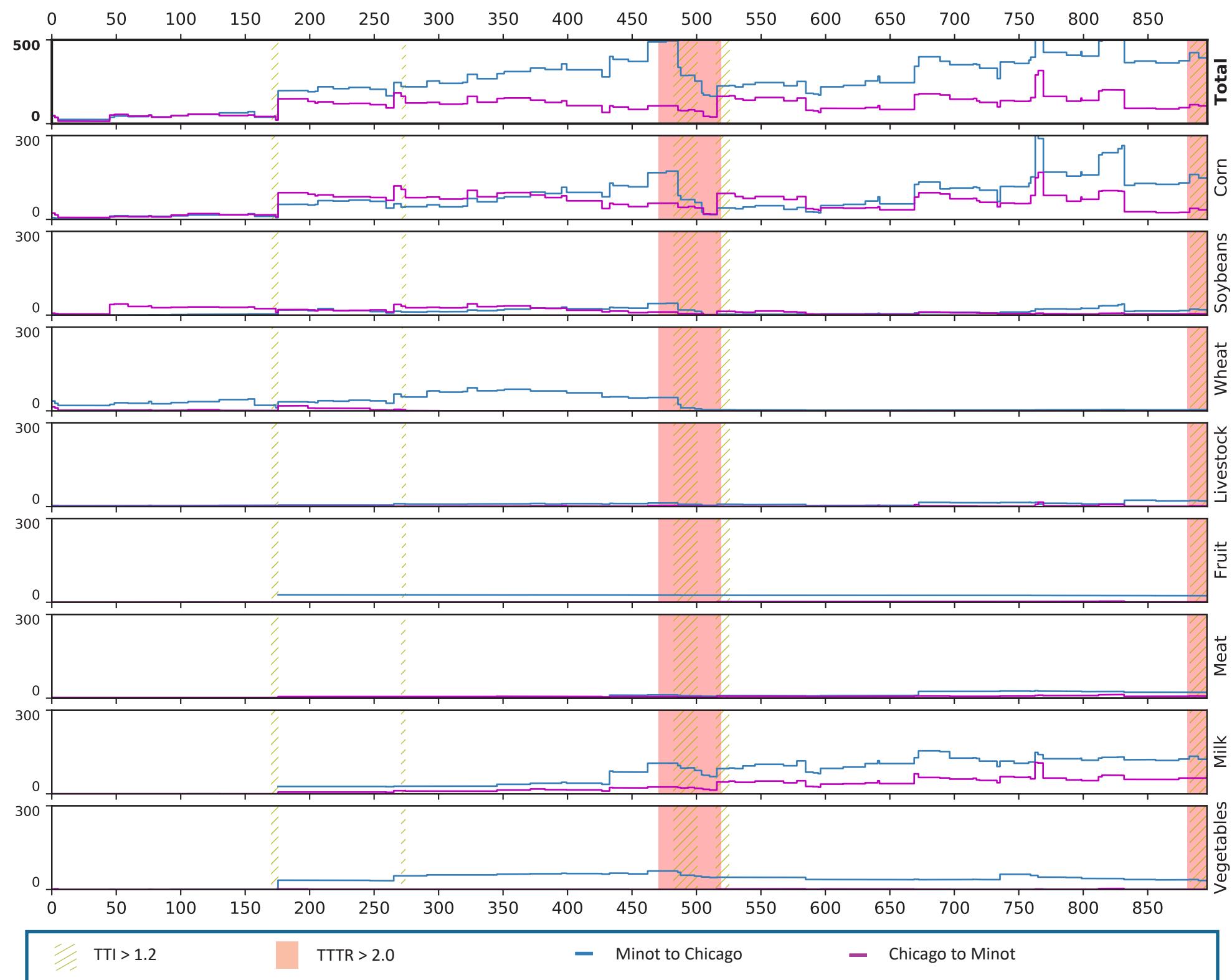
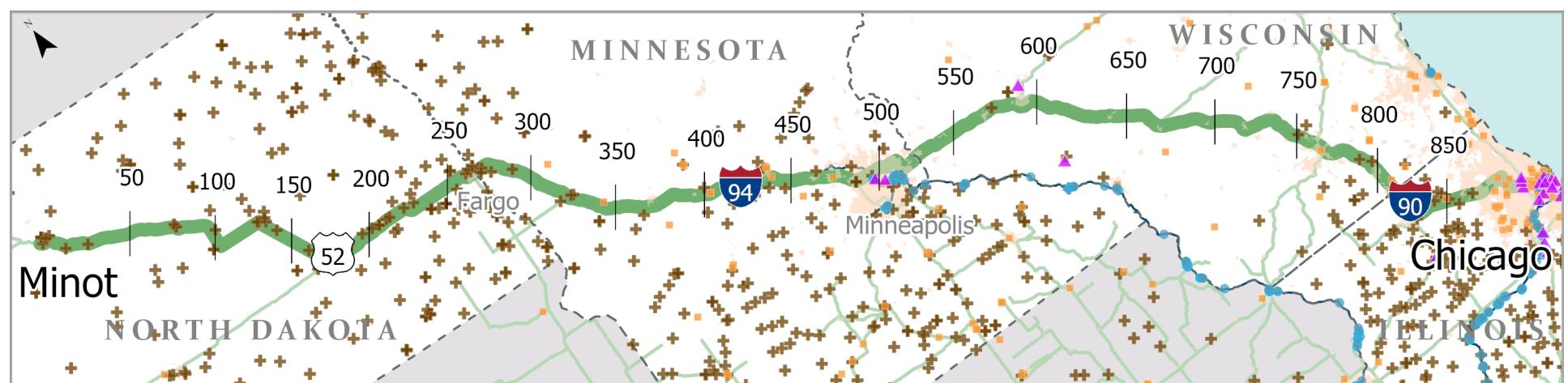
Map Legend

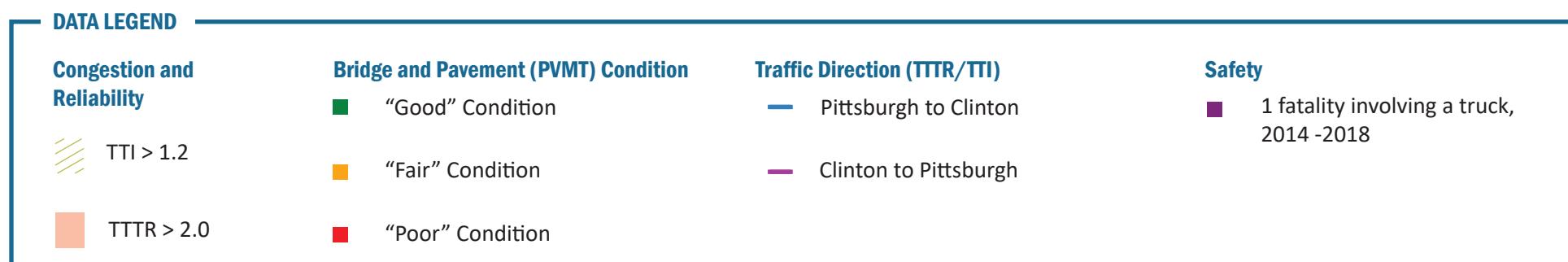
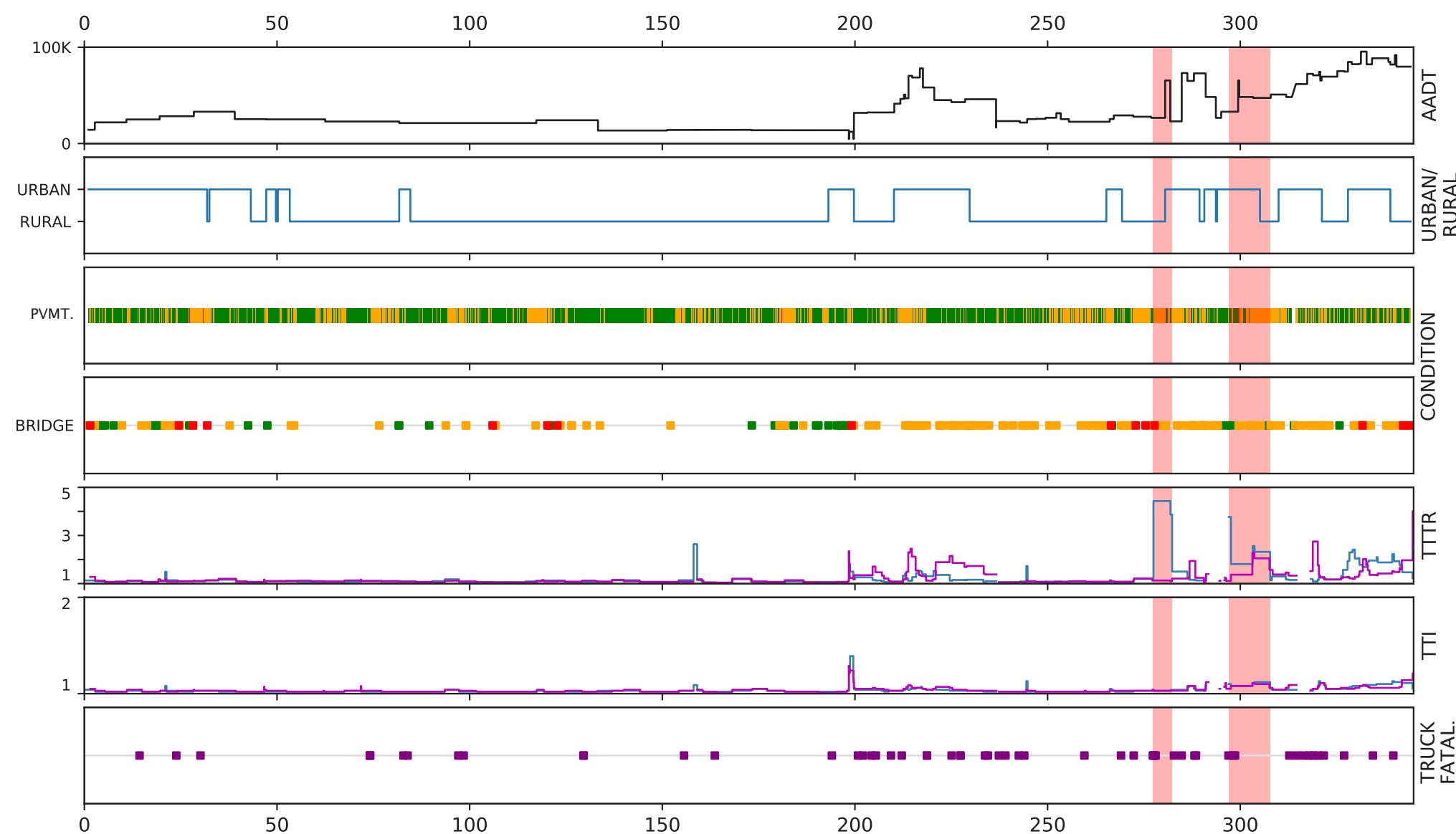
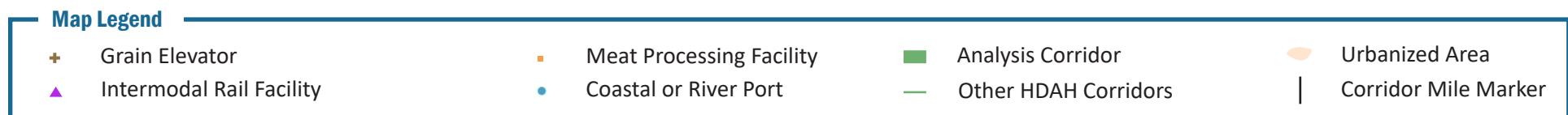
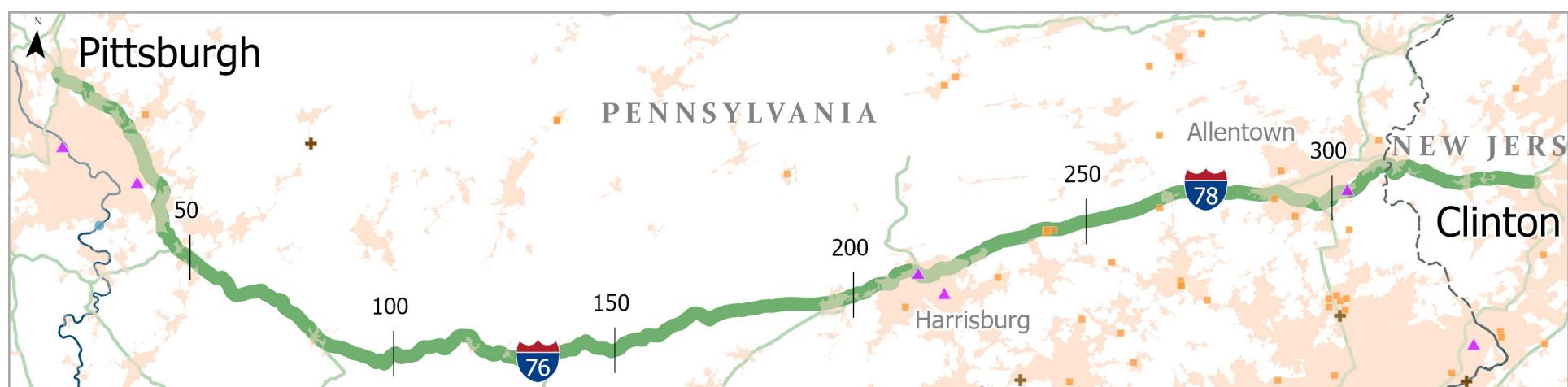
- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | — | Corridor Mile Marker |



Corridor #11:
Minot, ND, to Chicago, IL

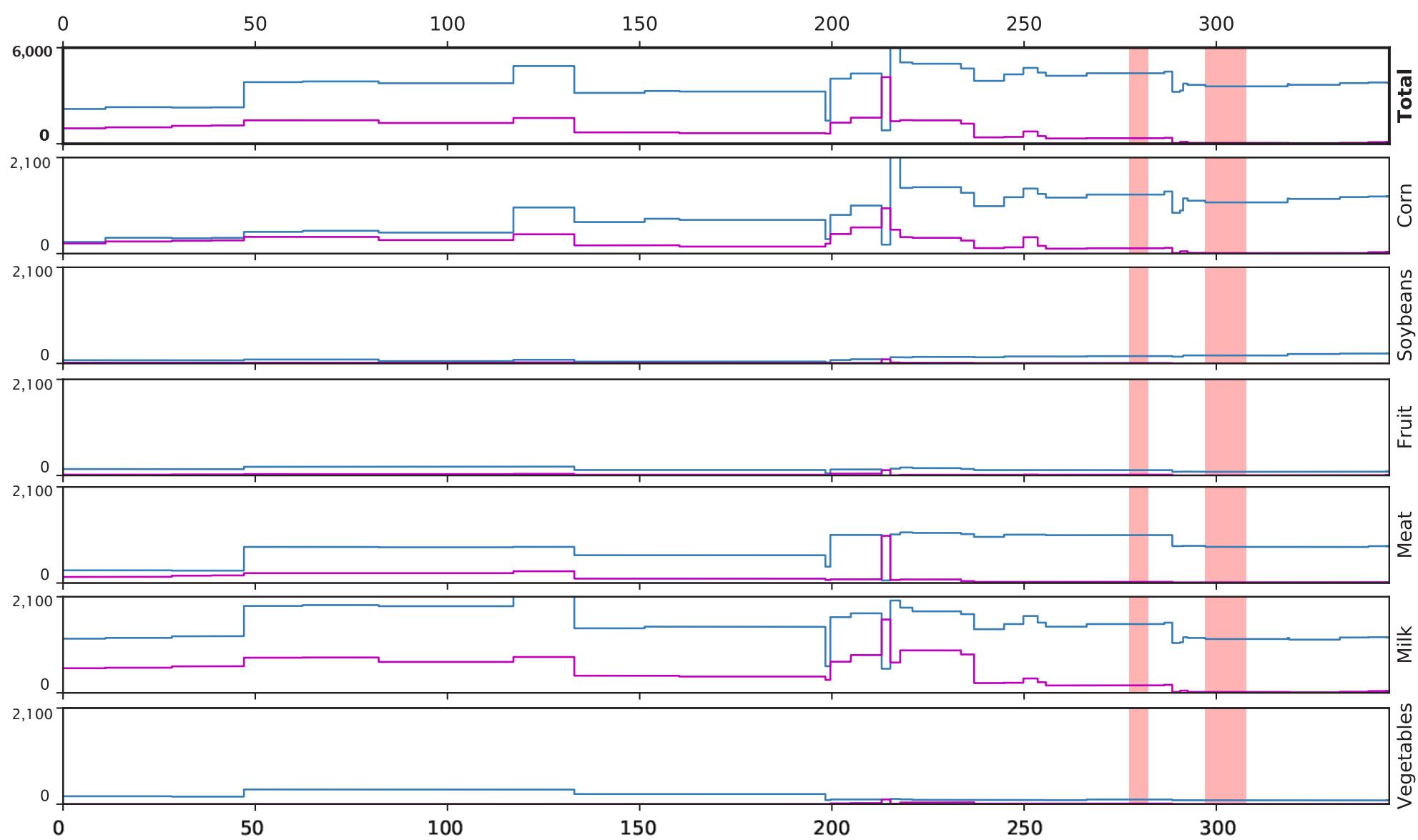
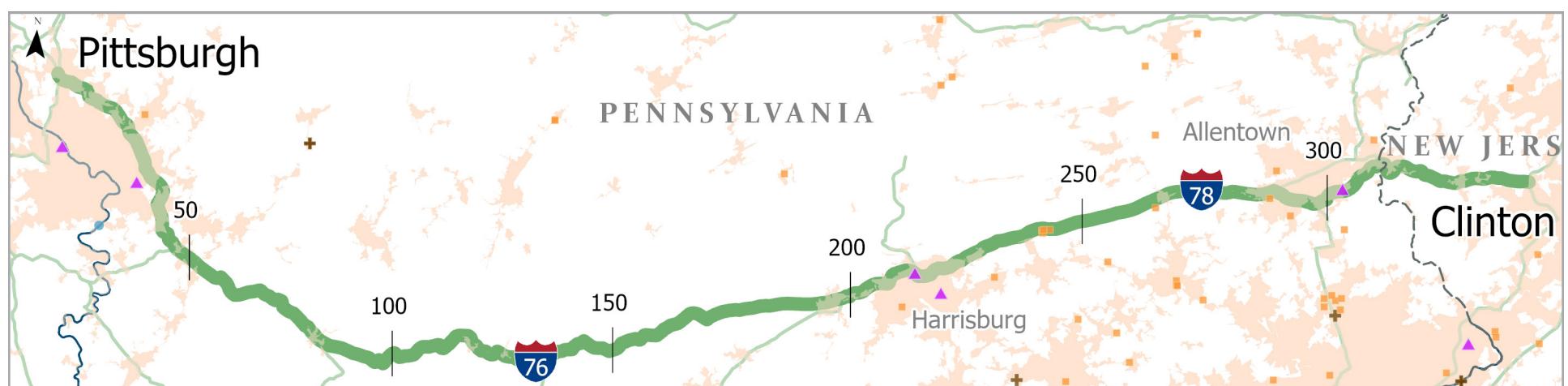
UNITS (in thousands of trucks)





Corridor #12:
Pittsburgh, PA, to Clinton, NJ

TONNAGE (in millions of tons)



DATA LEGEND

Congestion and Reliability

TTI > 1.2

TTTR > 2.0

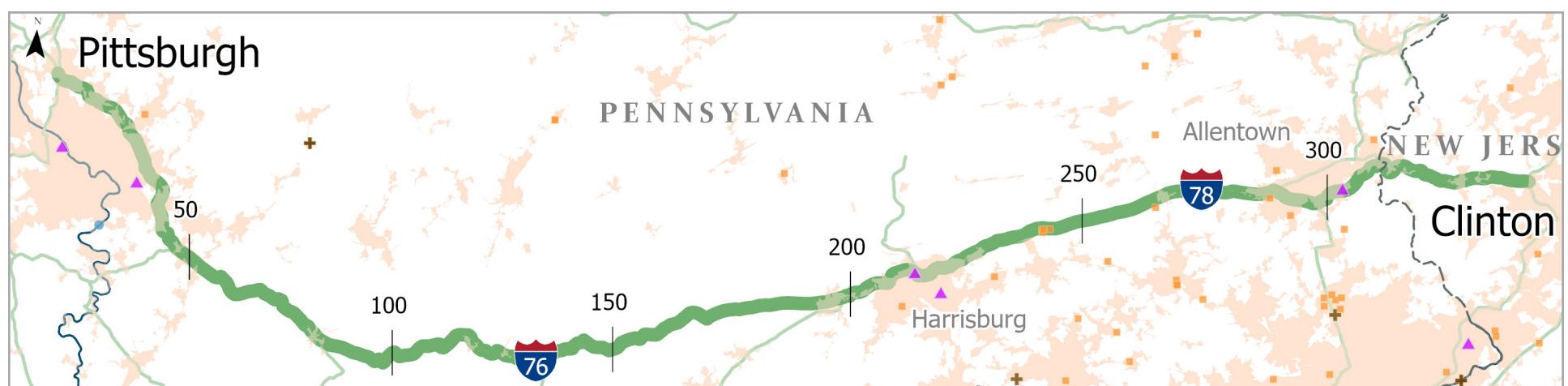
Traffic Direction

Pittsburgh to Clinton

Clinton to Pittsburgh

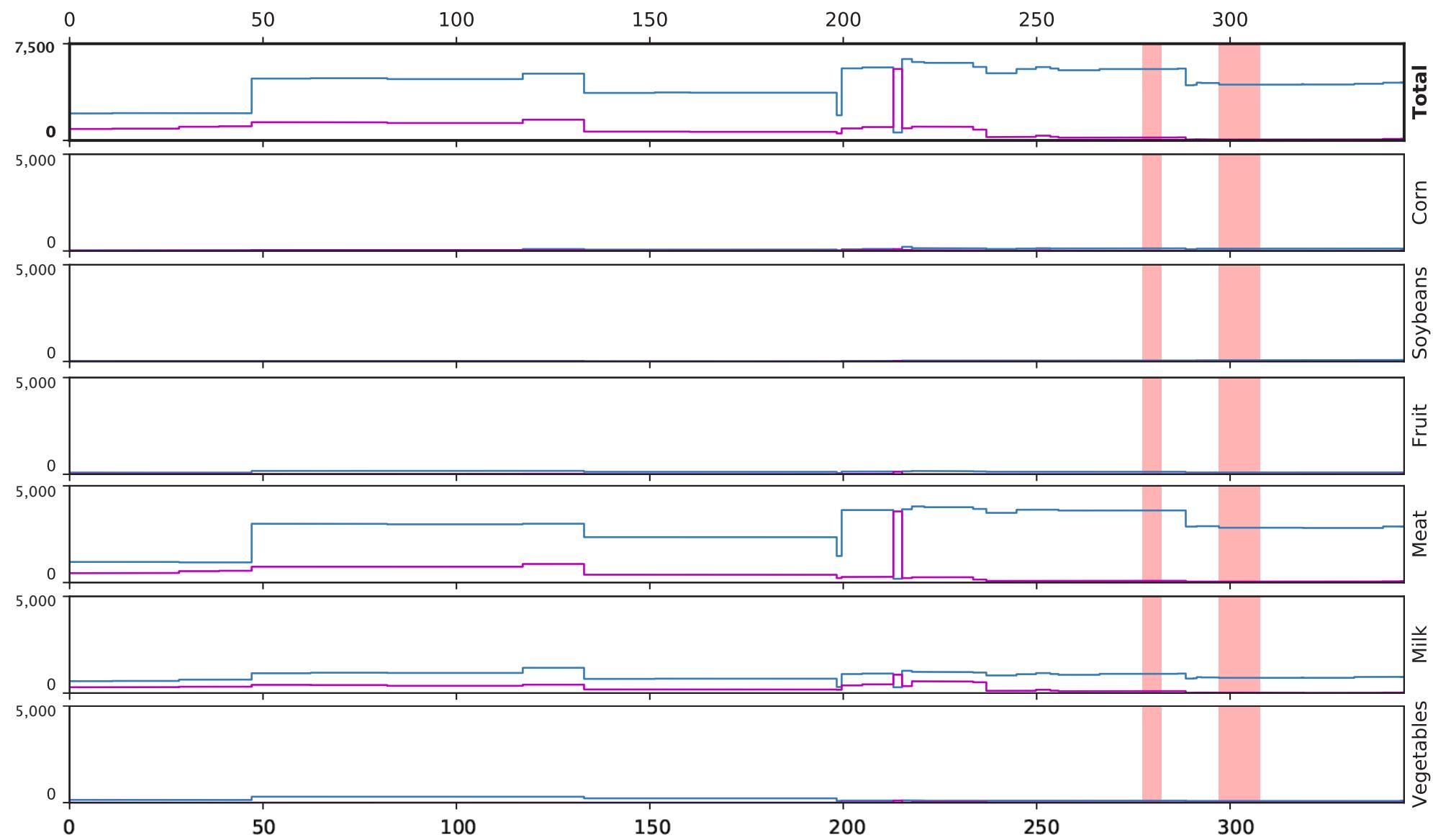
Corridor #12:
Pittsburgh, PA, to Clinton, NJ

VALUE (in millions of dollars)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ■ | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | — | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



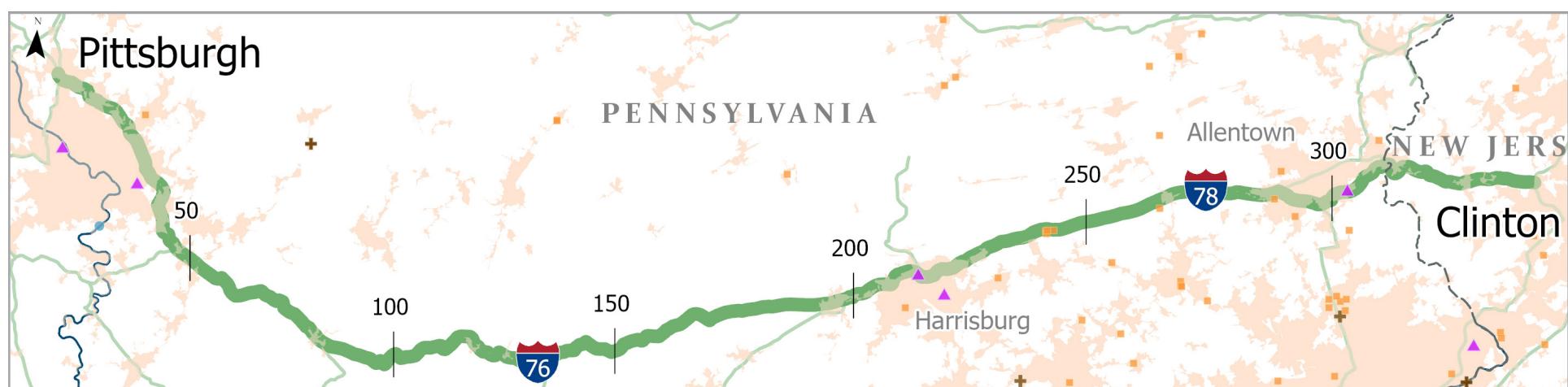
Traffic Direction

— Pittsburgh to Clinton

— Clinton to Pittsburgh

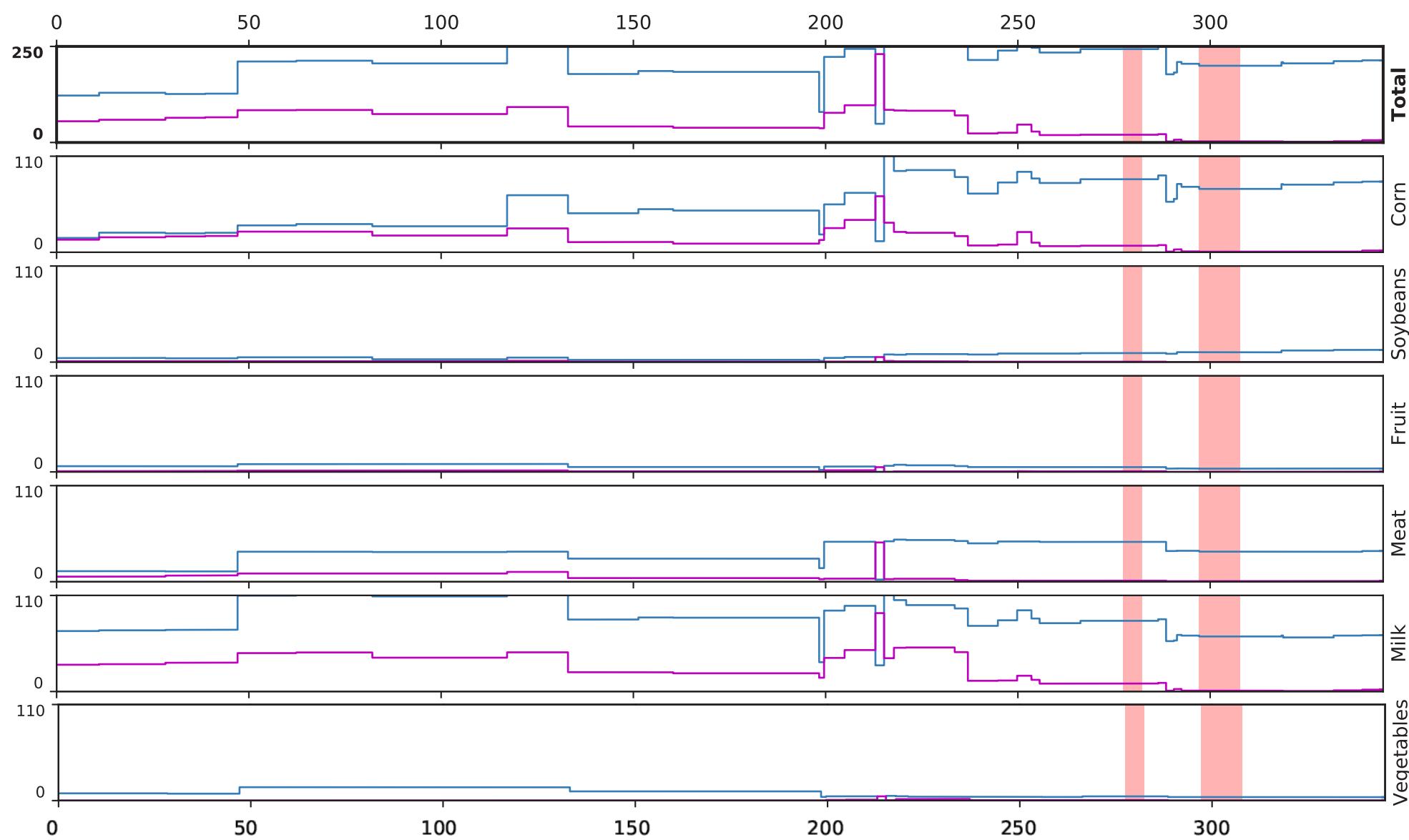
Corridor #12:
Pittsburgh, PA, to Clinton, NJ

UNITS (in thousands of trucks)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ■ | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | | Corridor Mile Marker |



DATA LEGEND

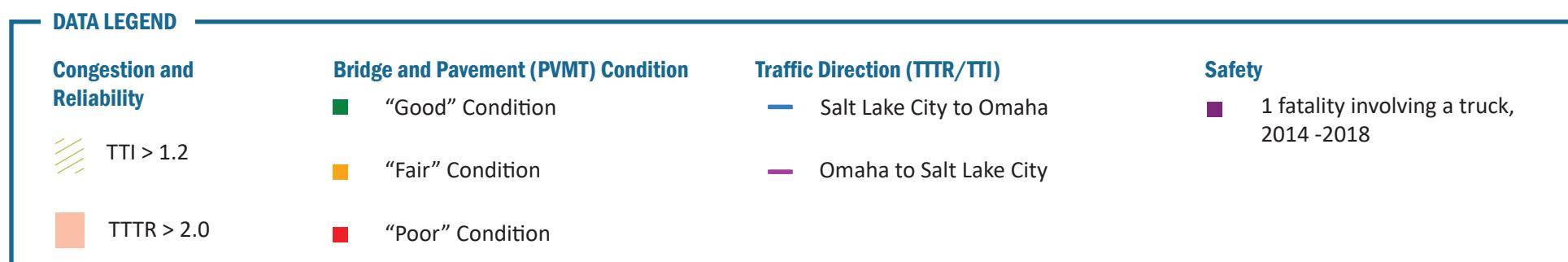
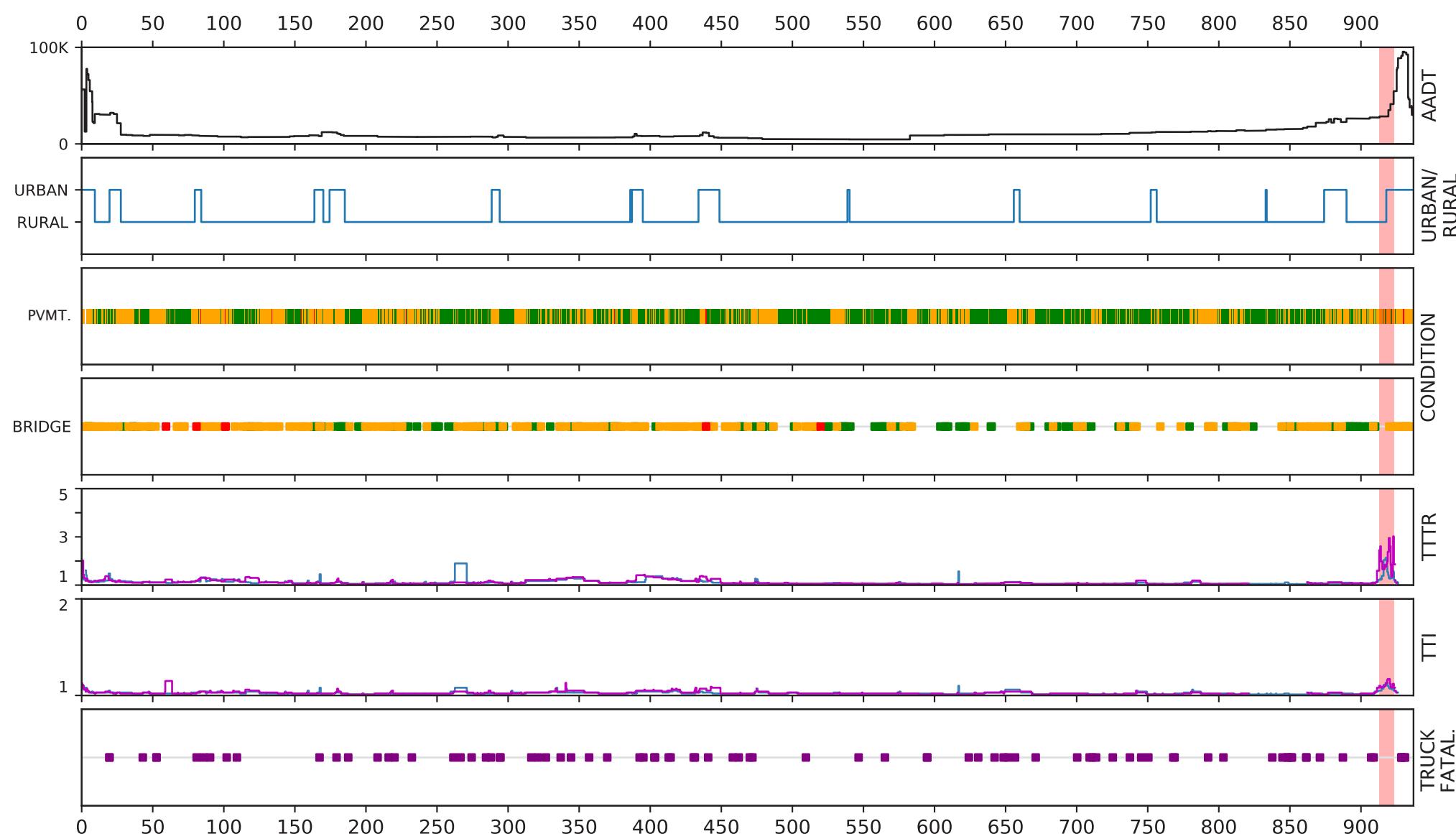
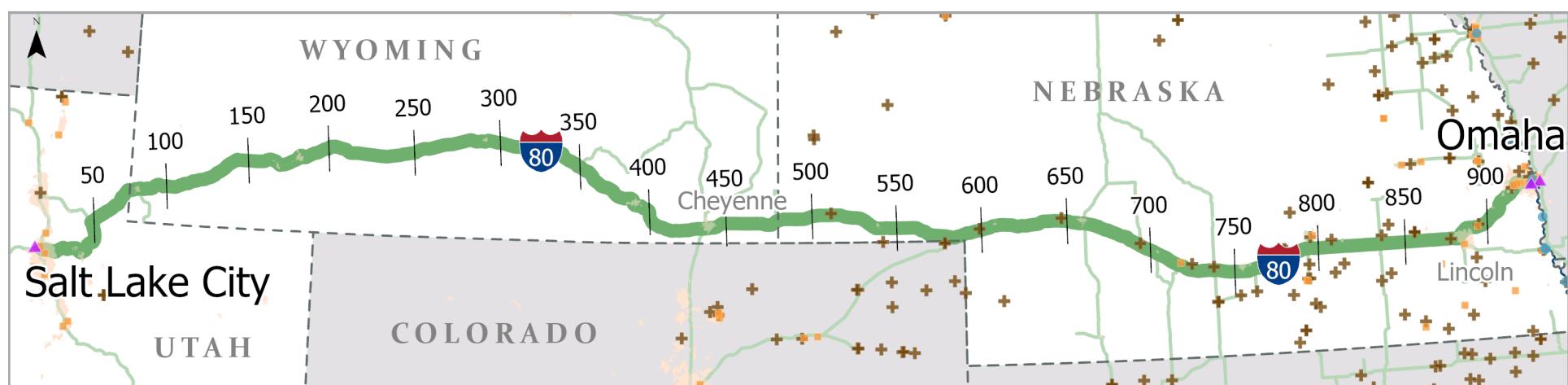
Congestion and Reliability



Traffic Direction

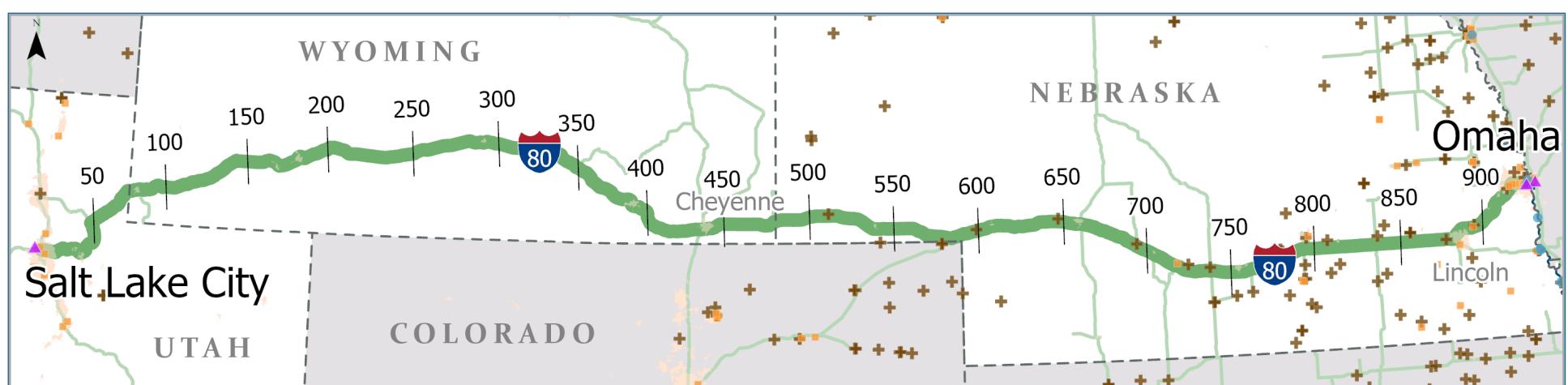
— Pittsburgh to Clinton

— Clinton to Pittsburgh



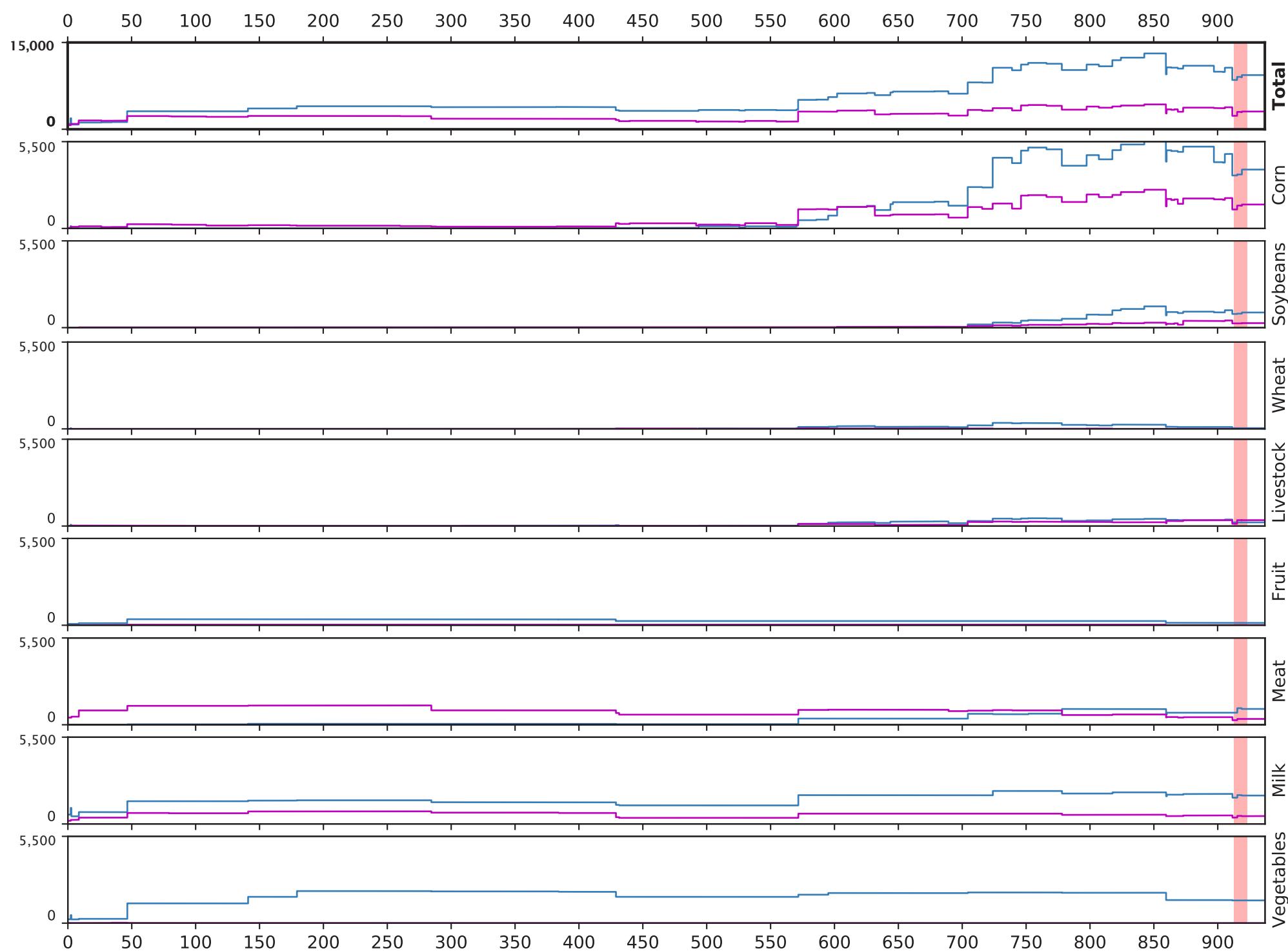
Corridor #13:
Salt Lake City, UT, to Omaha, NE

TONNAGE (in millions of tons)



Map Legend

- + Grain Elevator
- Meat Processing Facility
- Analysis Corridor
- Urbanized Area
- ▲ Intermodal Rail Facility
- Coastal or River Port
- Other HDAH Corridors
- | Corridor Mile Marker



TTI > 1.2

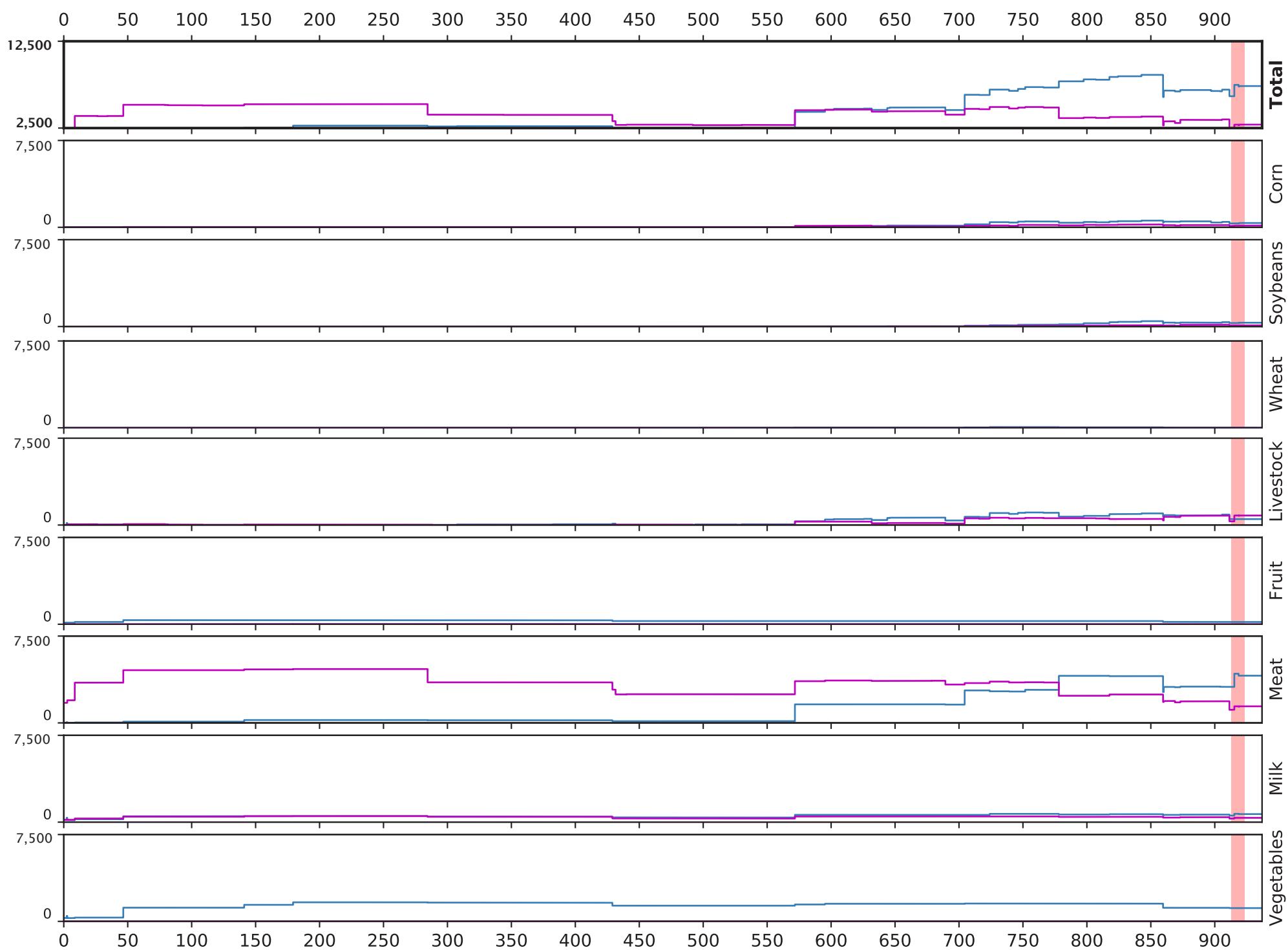
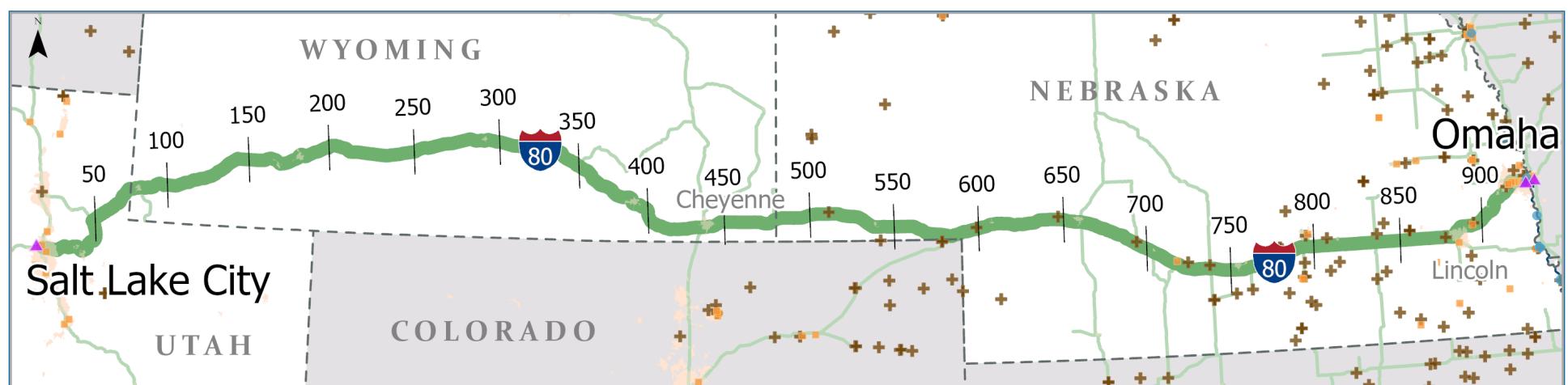
TTTR > 2.0

Salt Lake City to Omaha

Omaha to Salt Lake City

Corridor #13:
Salt Lake City, UT, to Omaha, NE

VALUE (in millions of dollars)



TTI > 1.2

TTTR > 2.0

Salt Lake City to Omaha

Omaha to Salt Lake City

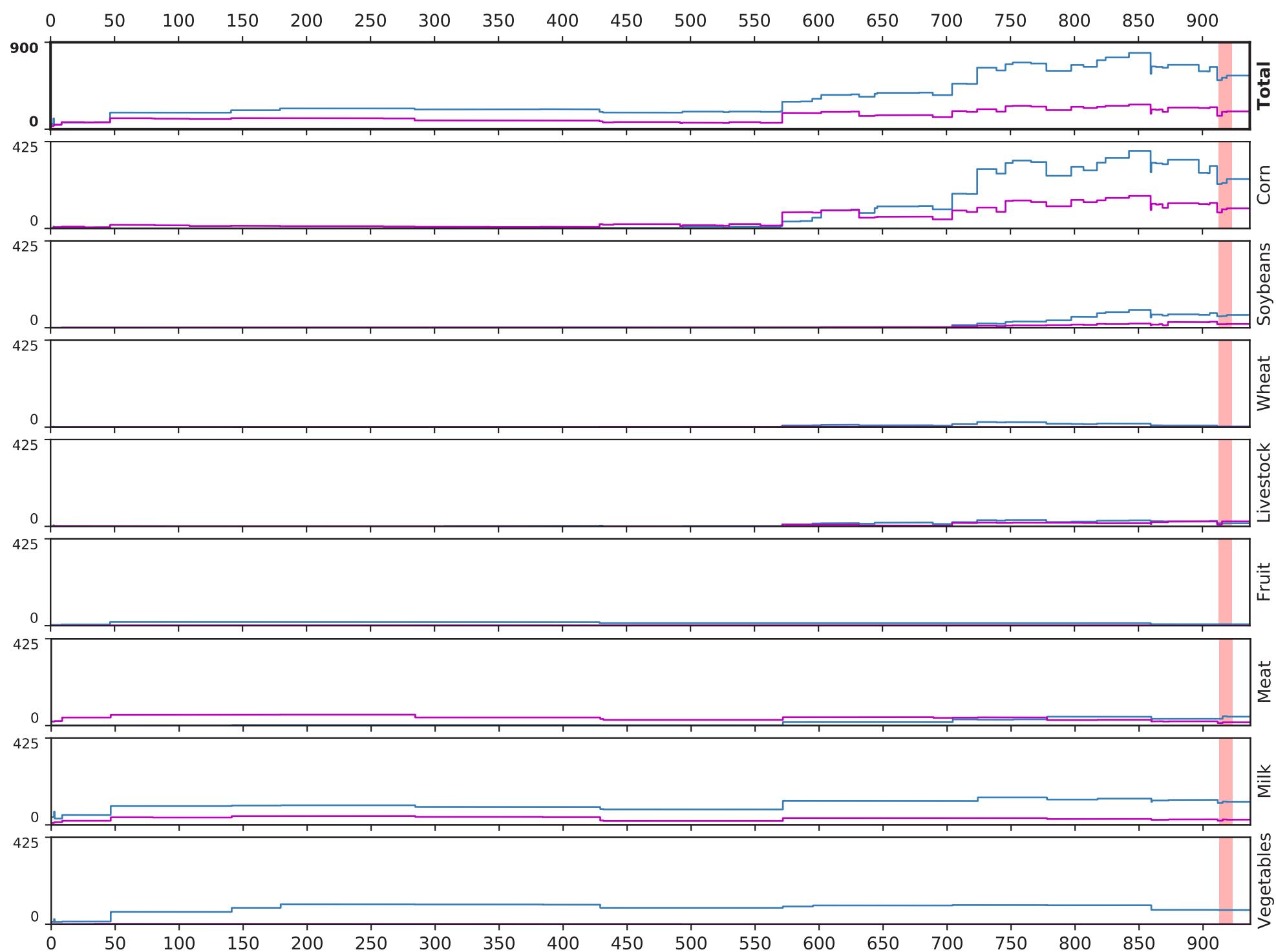
Corridor #13:
Salt Lake City, UT, to Omaha, NE

UNITS (in thousands of trucks)



Map Legend

- + Grain Elevator
- Meat Processing Facility
- Analysis Corridor
- Urbanized Area
- ▲ Intermodal Rail Facility
- Coastal or River Port
- Other HDAH Corridors
- | Corridor Mile Marker



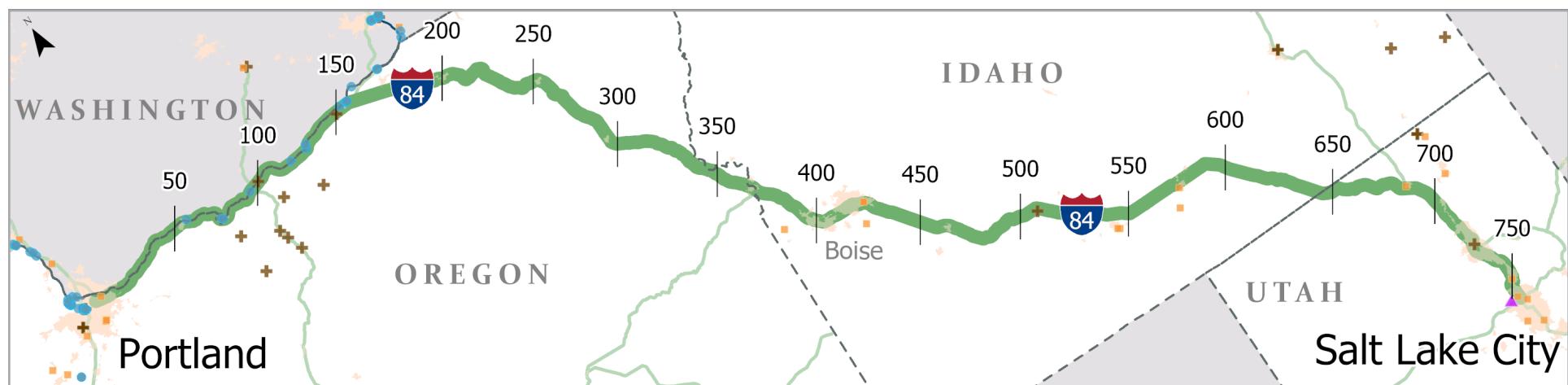
TTI > 1.2



TTTR > 2.0

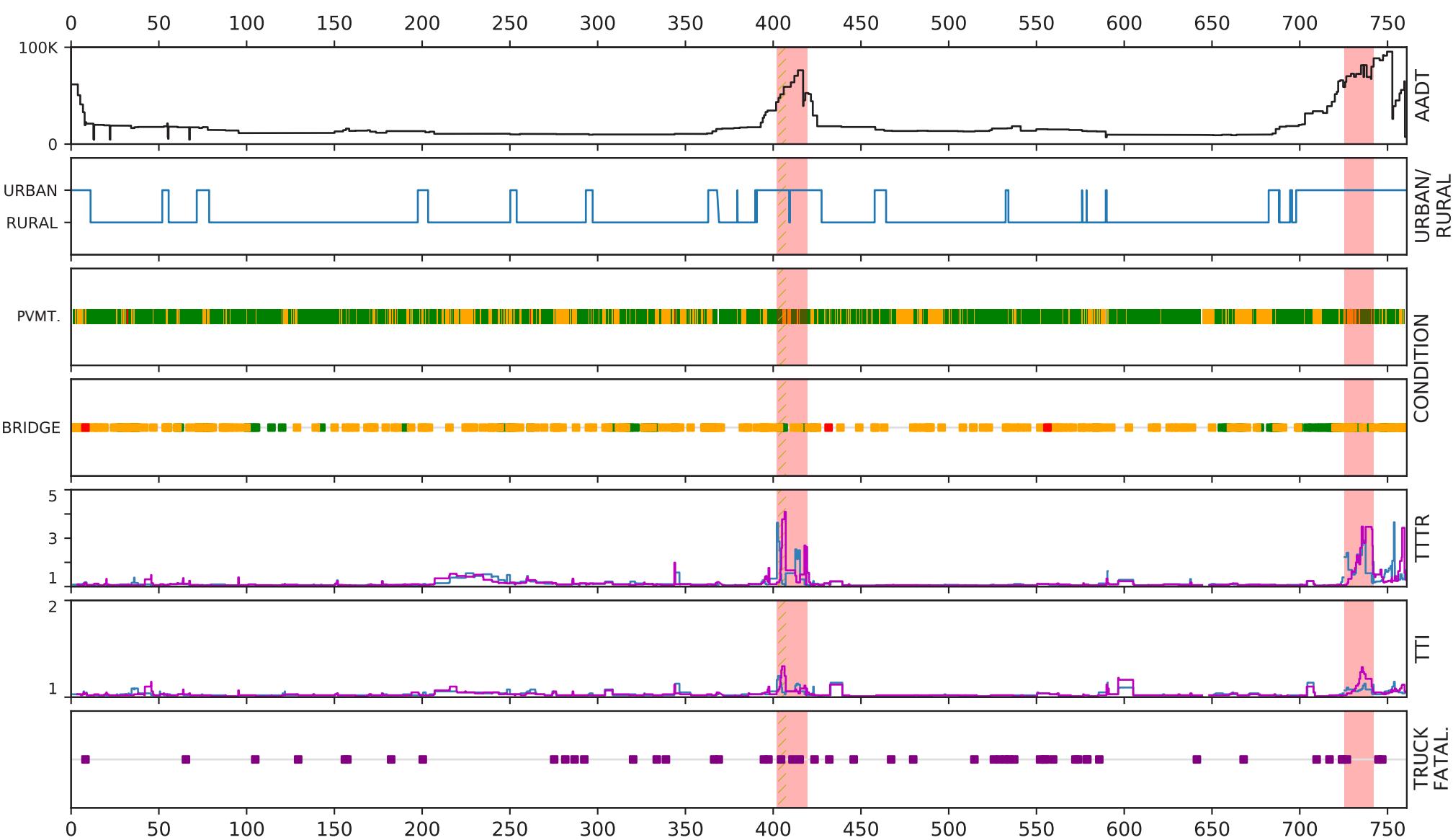
— Salt Lake City to Omaha

— Omaha to Salt Lake City



Map Legend

- + Grain Elevator
- Analysis Corridor
- ▲ Intermodal Rail Facility
- Meat Processing Facility
- Coastal or River Port
- Other HDAH Corridors
- Urbanized Area
- | Corridor Mile Marker



DATA LEGEND

Congestion and Reliability

TTI > 1.2

TTTR > 2.0

Bridge and Pavement (PVMT) Condition

■ "Good" Condition

■ "Fair" Condition

■ "Poor" Condition

Traffic Direction (TTTR/TTI)

— Portland to Salt Lake City

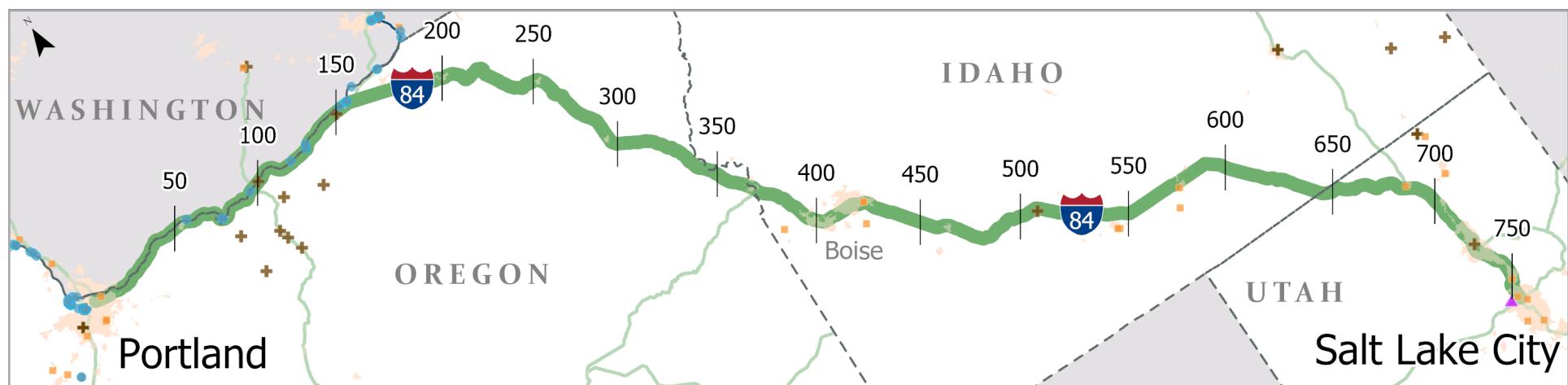
— Salt Lake City to Portland

Safety

■ 1 fatality involving a truck, 2014 - 2018

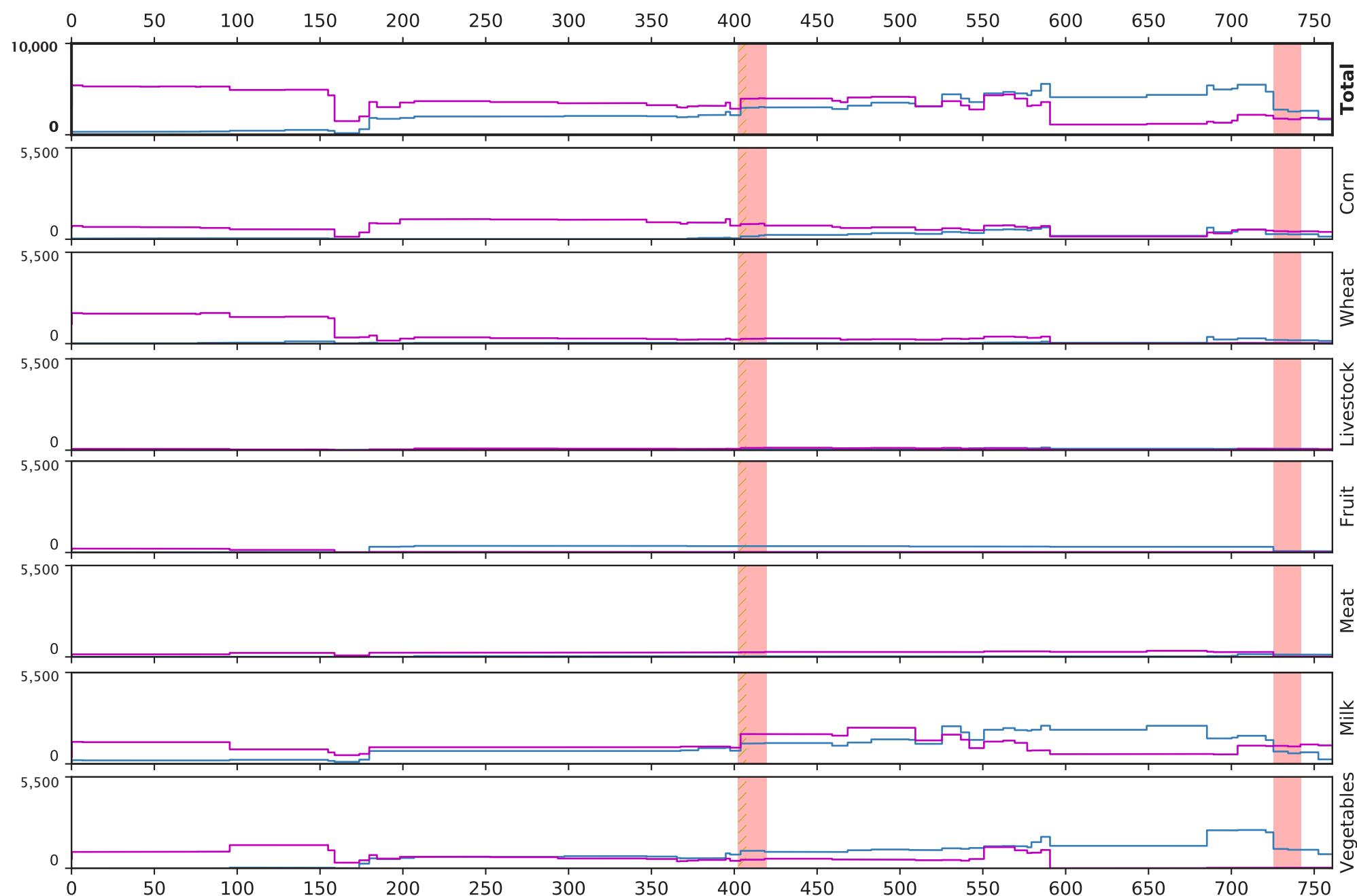
Corridor #14:
Portland, OR, to Salt Lake City, UT

TONNAGE (in millions of tons)



Map Legend

- + Grain Elevator
- Meat Processing Facility
- Analysis Corridor
- Urbanized Area
- ▲ Intermodal Rail Facility
- Coastal or River Port
- Other HDAH Corridors
- | Corridor Mile Marker



DATA LEGEND

Congestion and Reliability



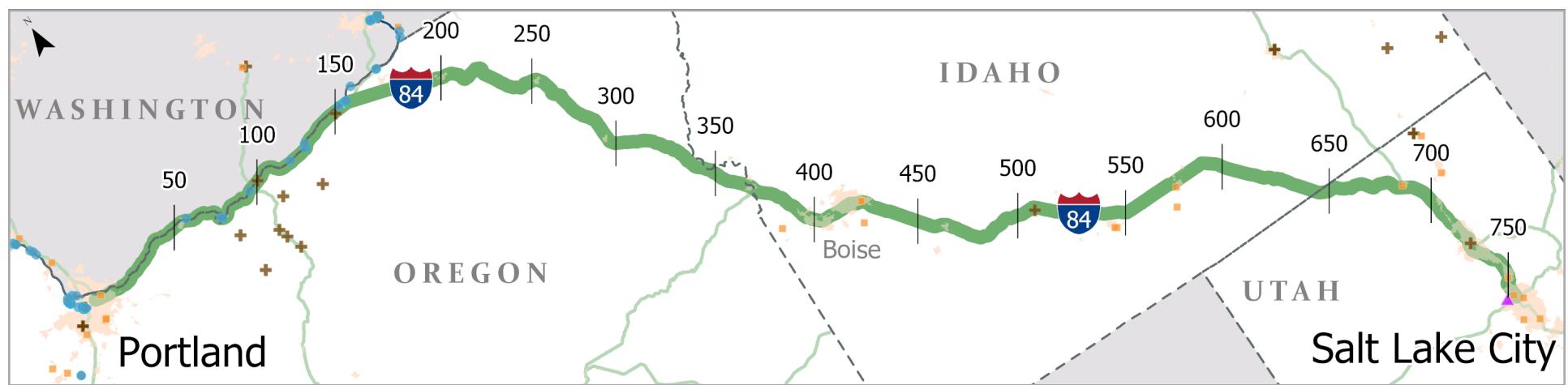
Traffic Direction

— Portland to Salt Lake City

— Salt Lake City to Portland

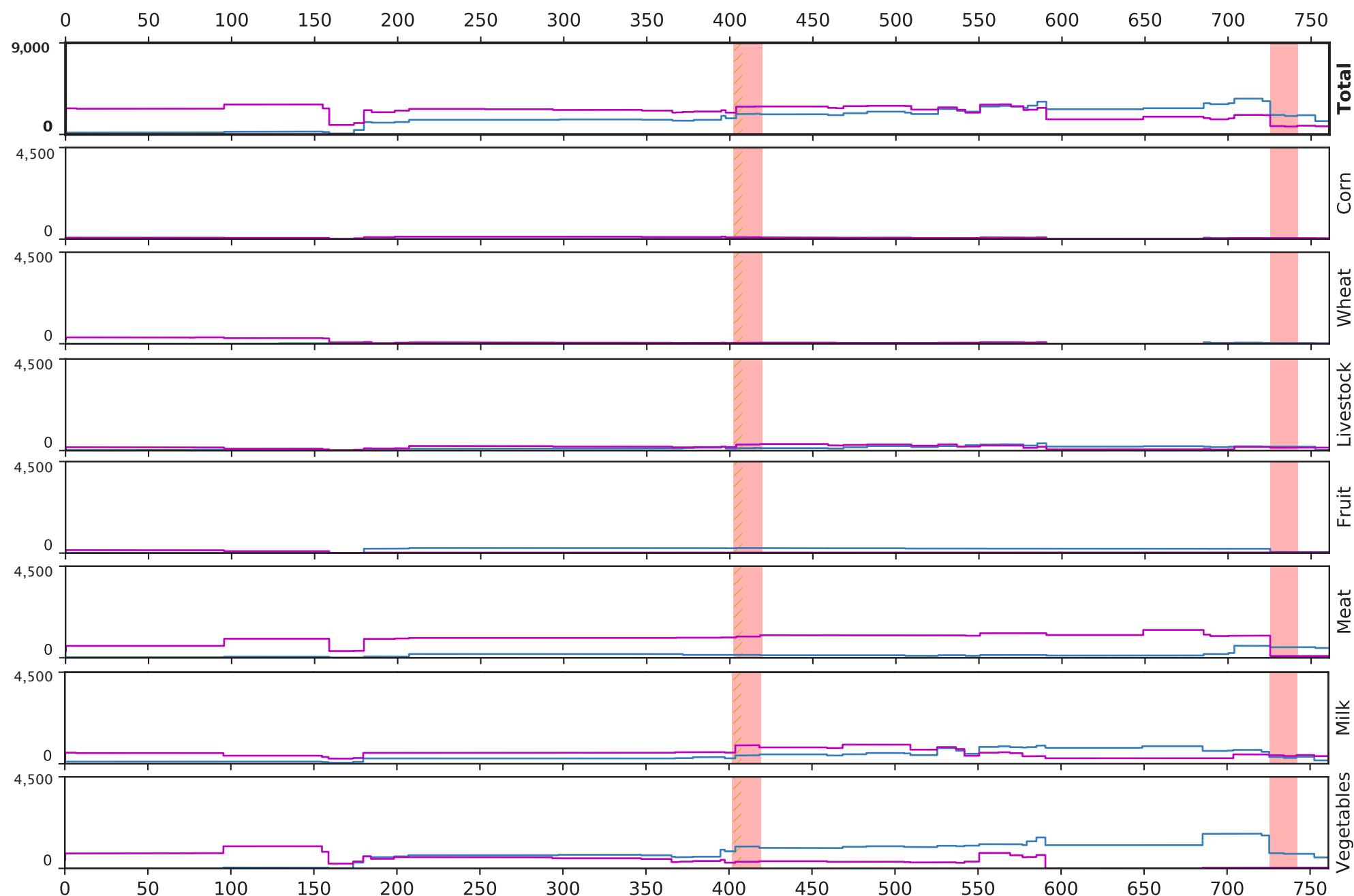
Corridor #14:
Portland, OR, to Salt Lake City, UT

VALUE (in millions of dollars)



Map Legend

- | | | | |
|----------------------------|----------------------------------------|---------------------------------------|------------------------------------|
| + Grain Elevator | Orange Square Meat Processing Facility | Green Line Analysis Corridor | Light Orange Shaded Urbanized Area |
| ▲ Intermodal Rail Facility | Blue Circle Coastal or River Port | Light Green Line Other HDAH Corridors | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



TTI > 2.0

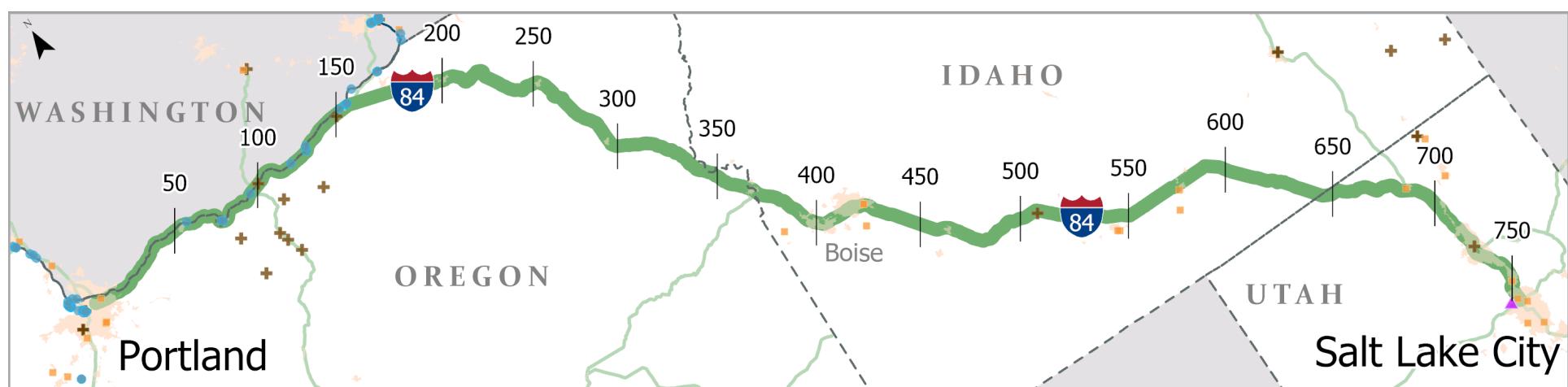
Traffic Direction

— Portland to Salt Lake City

— Salt Lake City to Portland

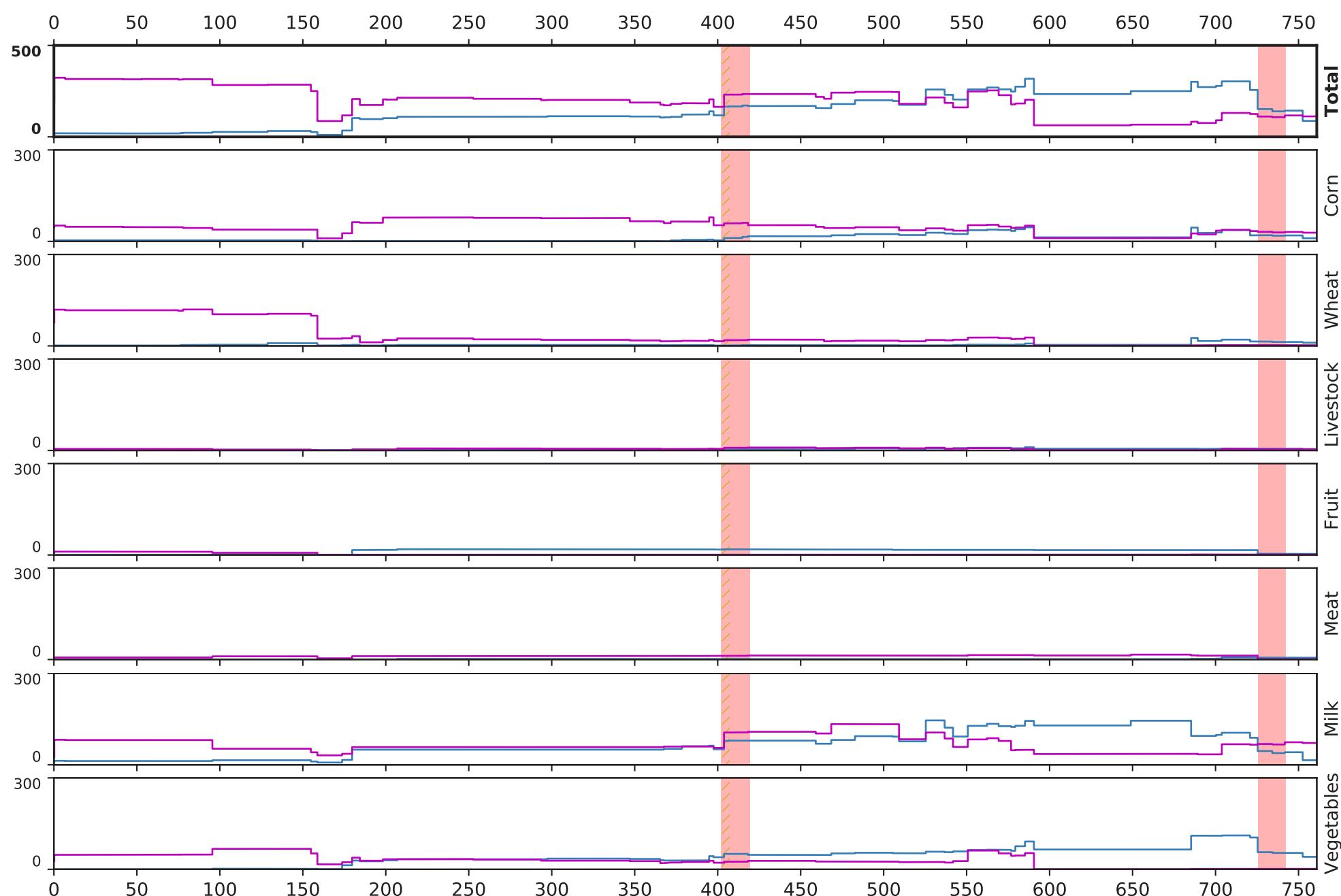
**Corridor #14:
Portland, OR, to Salt Lake City, UT**

UNITS (in thousands of trucks)



Map Legend

- + Grain Elevator
- Meat Processing Facility
- Analysis Corridor
- Urbanized Area
- ▲ Intermodal Rail Facility
- Coastal or River Port
- Other HDAH Corridors
- | Corridor Mile Marker



DATA LEGEND

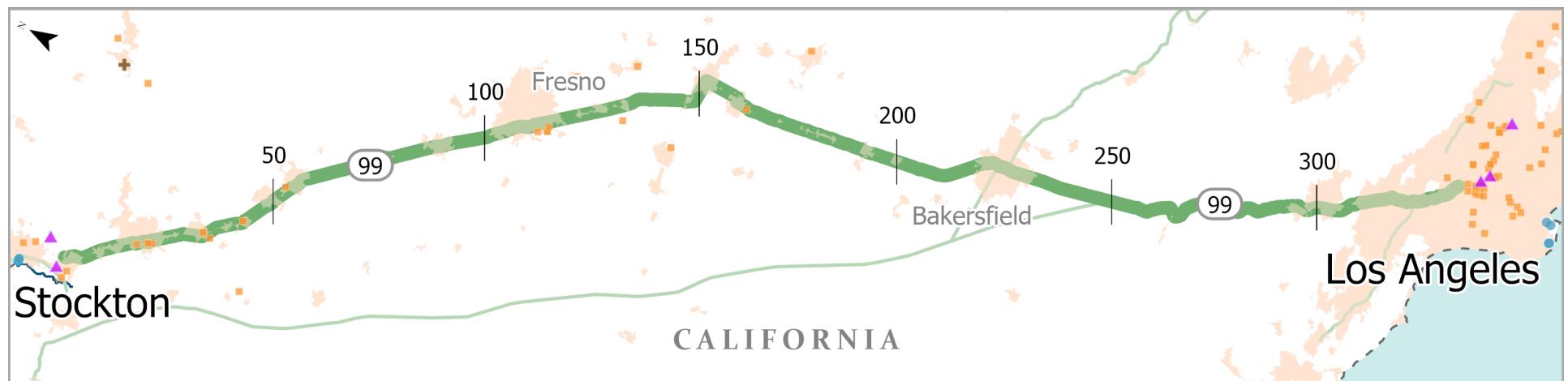
Congestion and Reliability



Traffic Direction

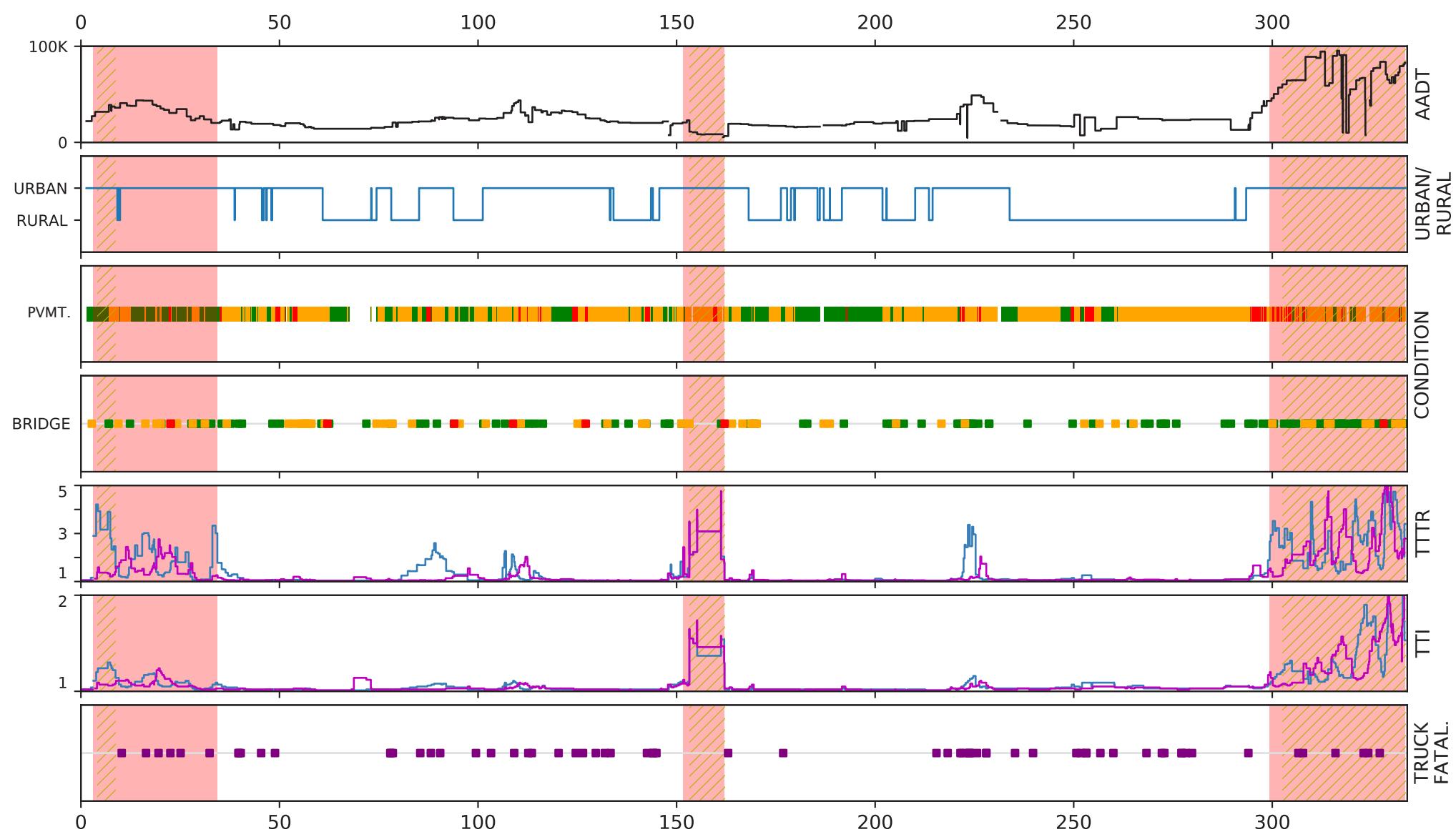
— Portland to Salt Lake City

— Salt Lake City to Portland



Map Legend

- ⊕ Grain Elevator
- ⊖ Meat Processing Facility
- Analysis Corridor
- Urbanized Area
- ▲ Intermodal Rail Facility
- Coastal or River Port
- Other HDAH Corridors
- | Corridor Mile Marker



DATA LEGEND

Congestion and Reliability

TTI > 1.2

TTTR > 2.0

Bridge and Pavement (PVMT) Condition

■ "Good" Condition

□ "Fair" Condition

■ "Poor" Condition

Traffic Direction (TTTR/TTI)

— Stockton to Los Angeles

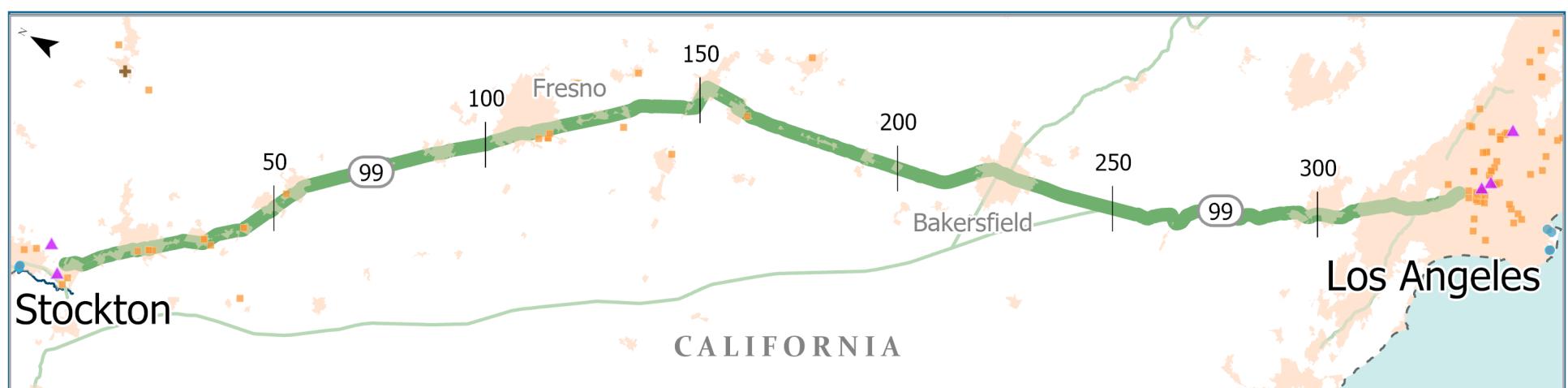
— Los Angeles to Stockton

Safety

■ 1 fatality involving a truck, 2014 - 2018

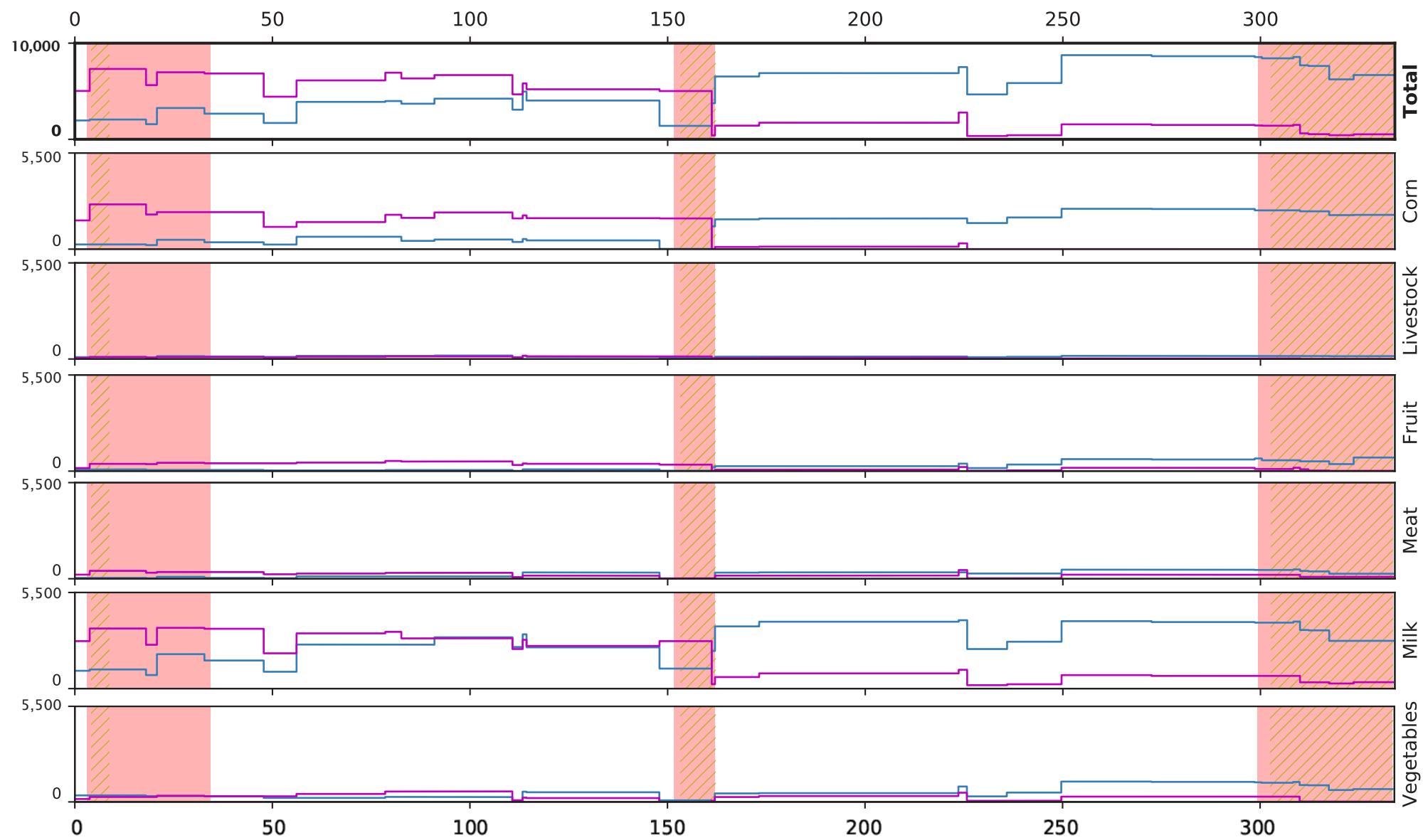
**Corridor #15:
Stockton, CA, to Los Angeles, CA**

TONNAGE (in millions of tons)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | — | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



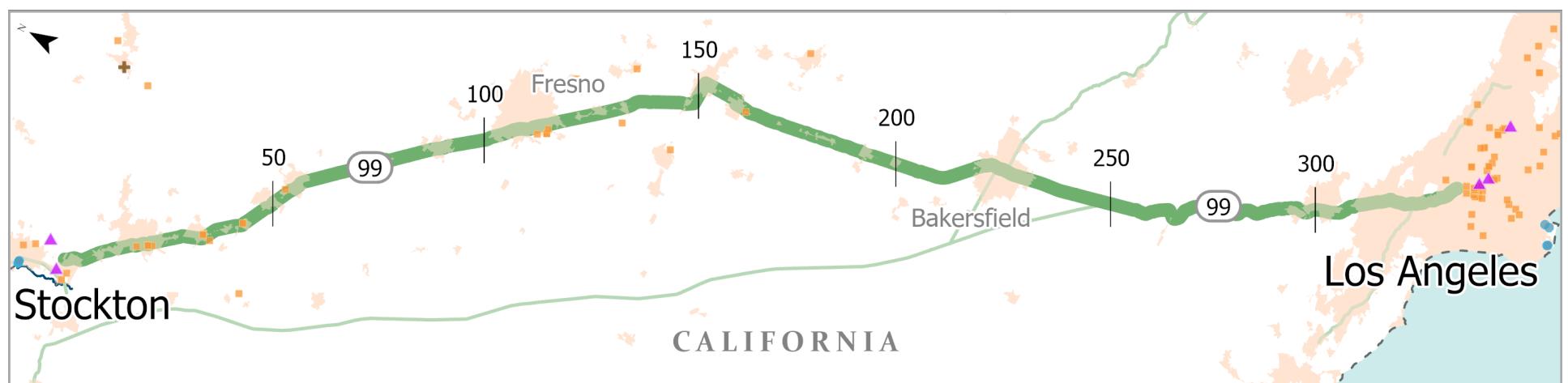
Traffic Direction

— Stockton to Los Angeles

— Los Angeles to Stockton

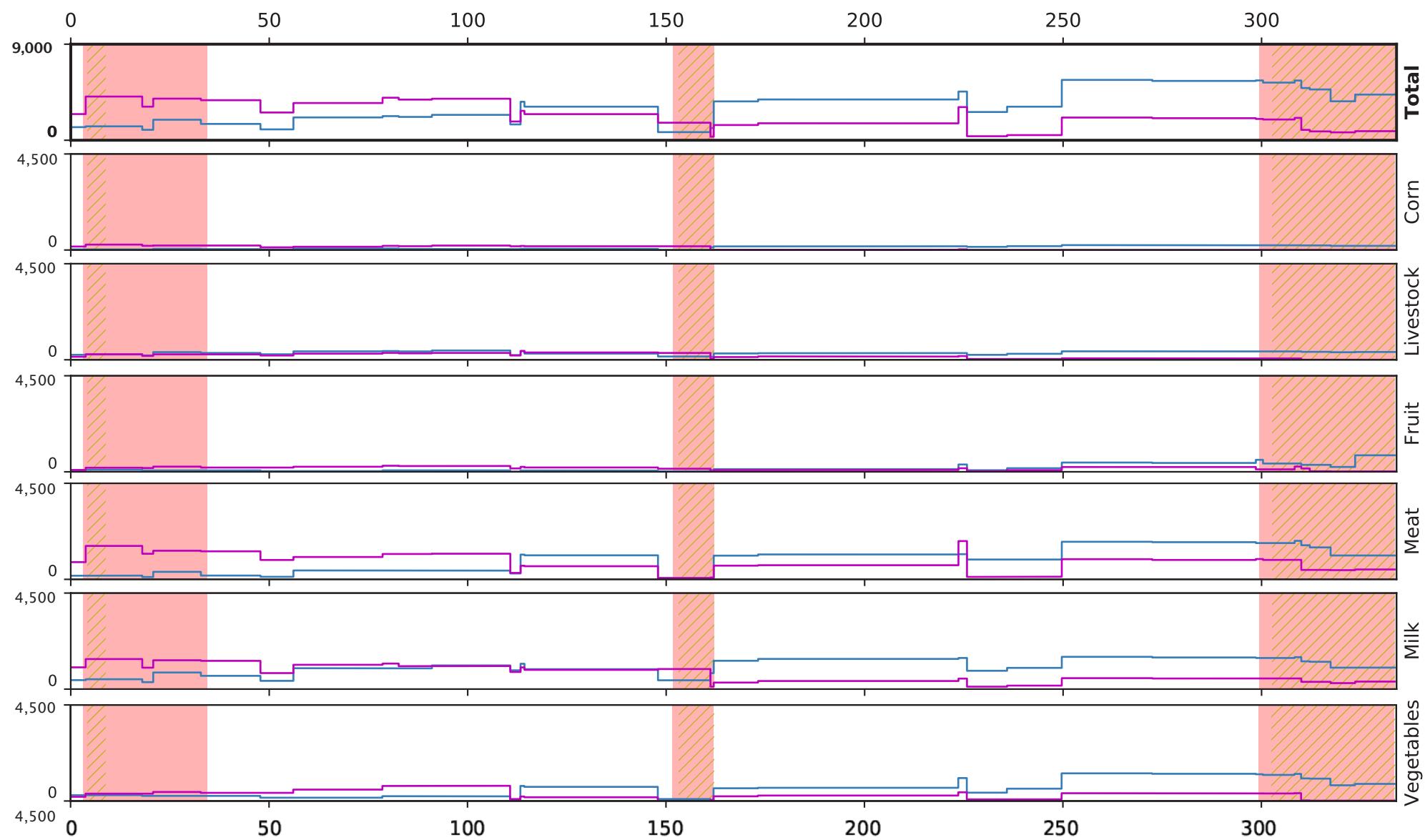
Corridor #15:
Stockton, CA, to Los Angeles, CA

VALUE (in millions of dollars)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | — | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



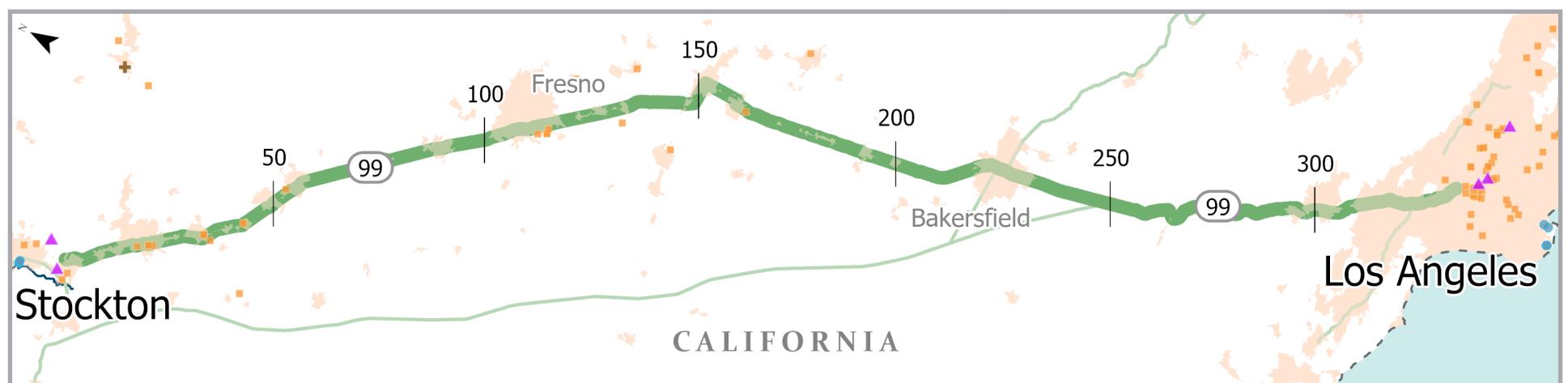
Traffic Direction

— Stockton to Los Angeles

— Los Angeles to Stockton

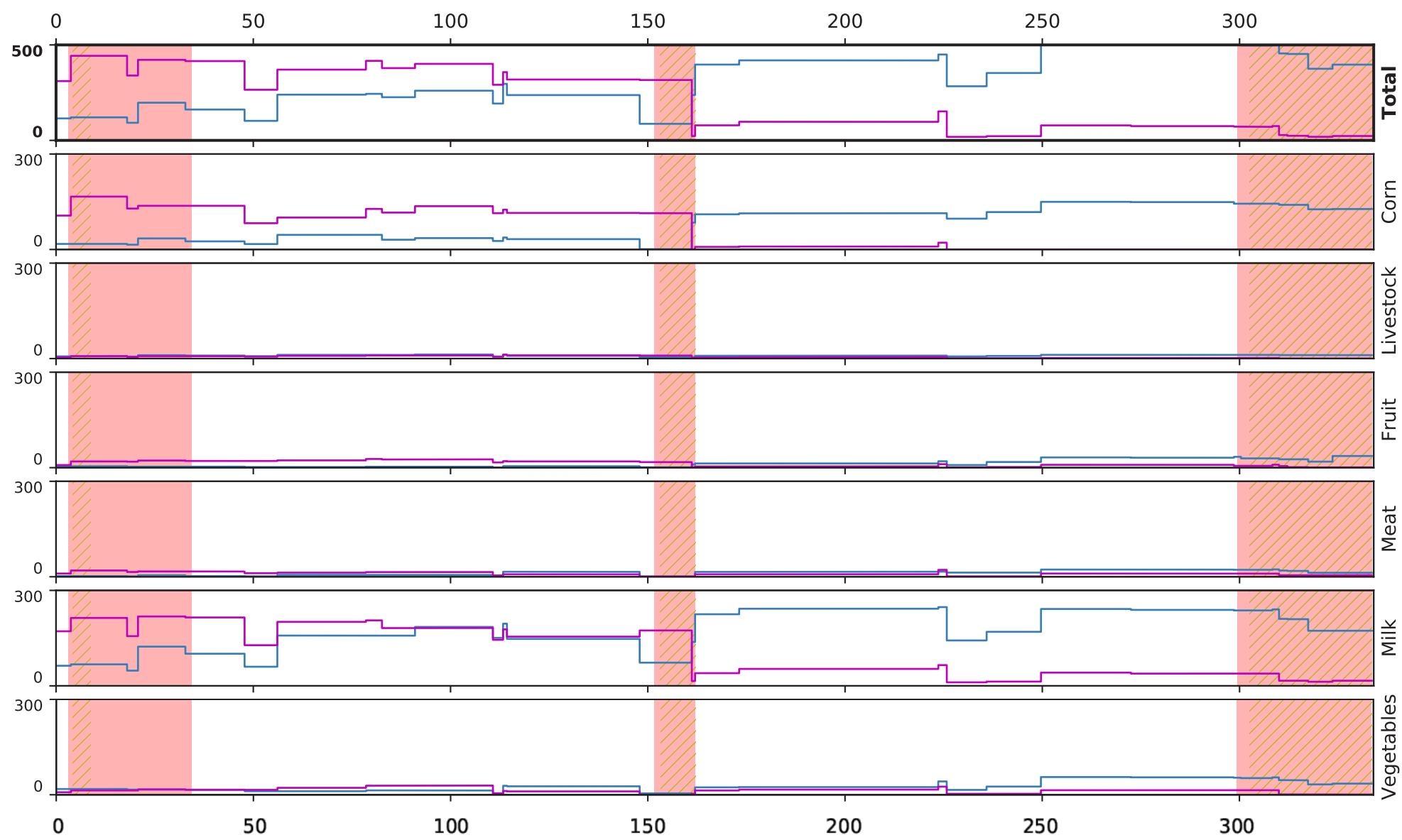
Corridor #15:
Stockton, CA, to Los Angeles, CA

UNITS (in thousands of trucks)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ● | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | — | Corridor Mile Marker |



DATA LEGEND

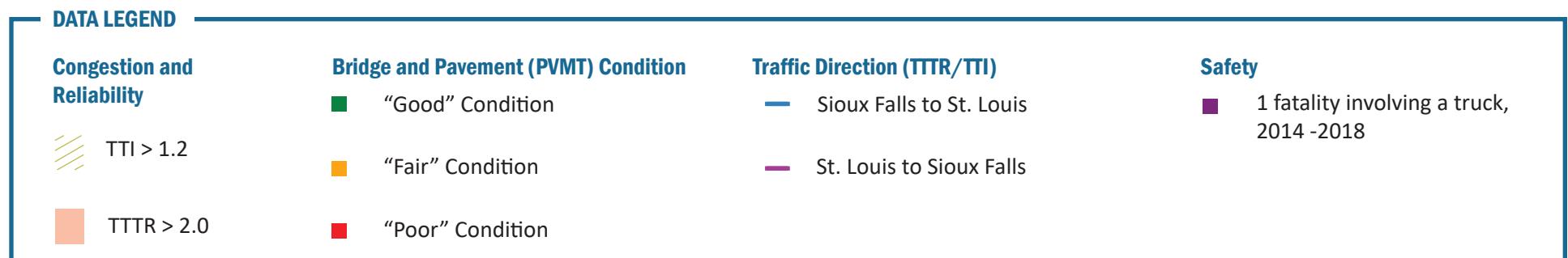
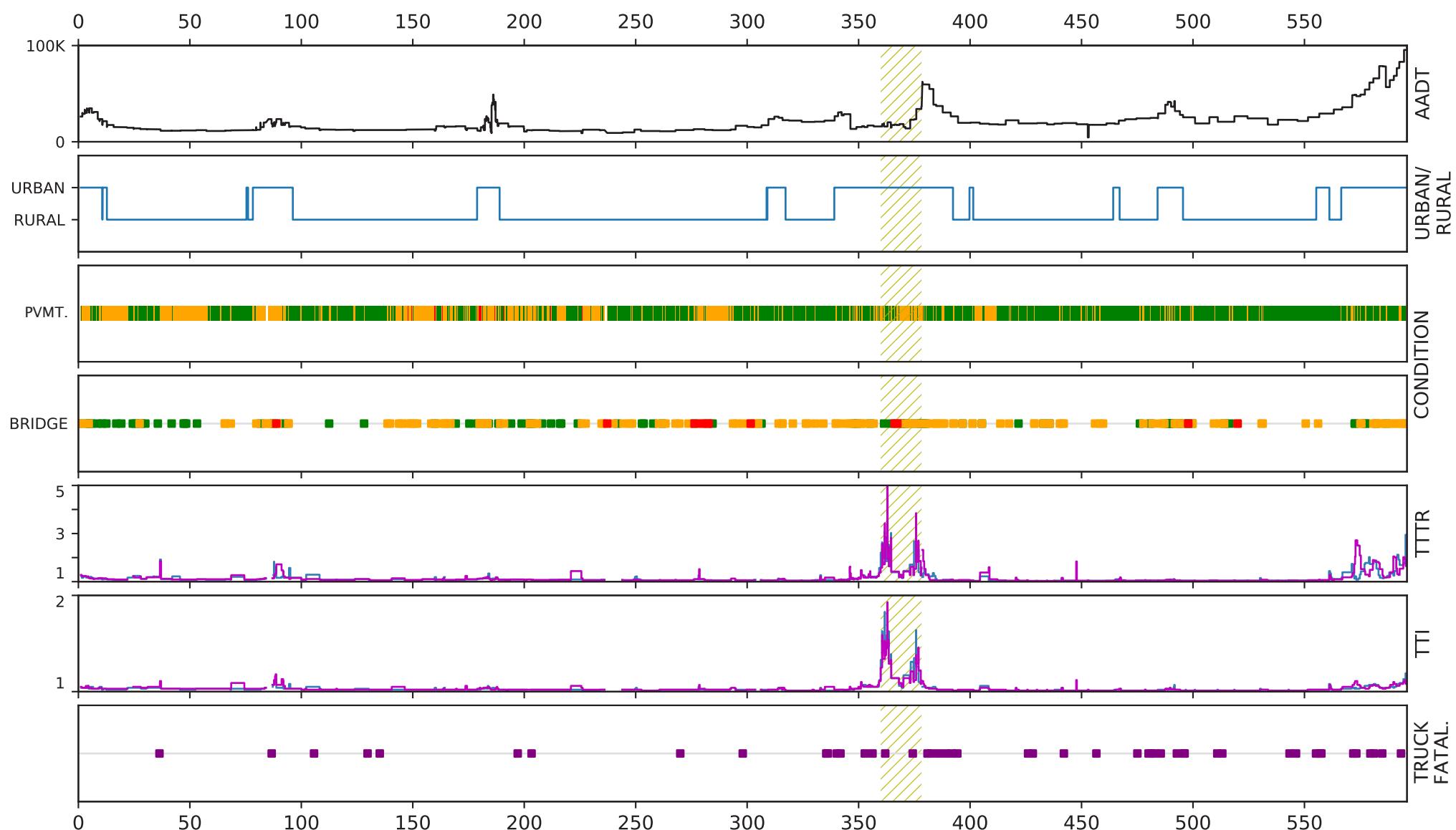
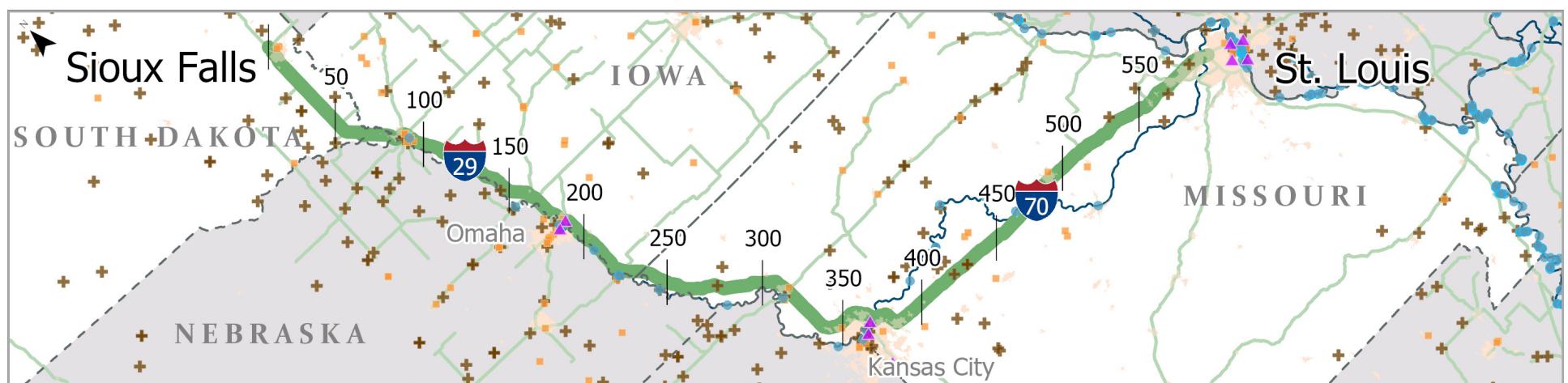
Congestion and Reliability



Traffic Direction

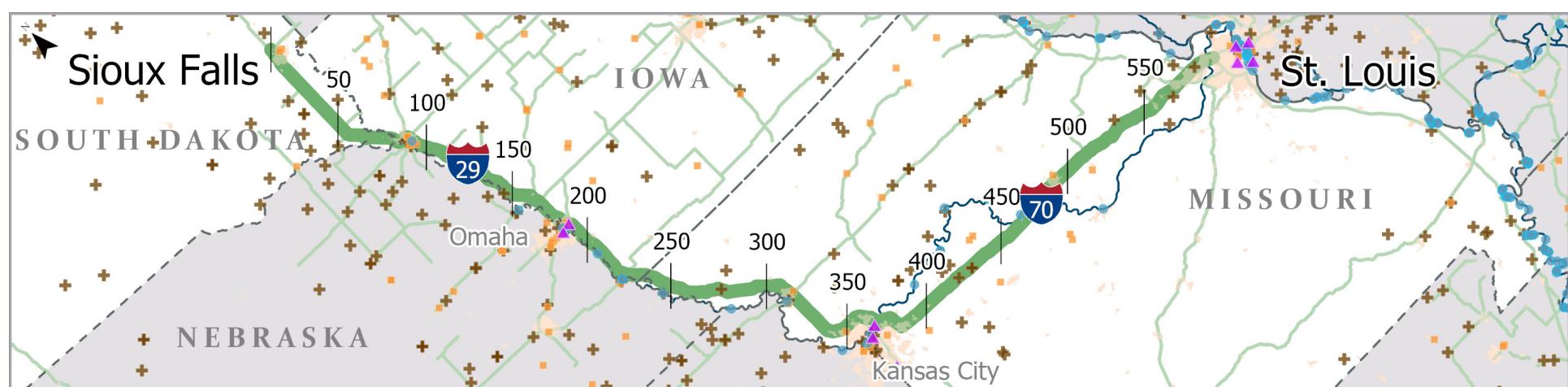
— Stockton to Los Angeles

— Los Angeles to Stockton

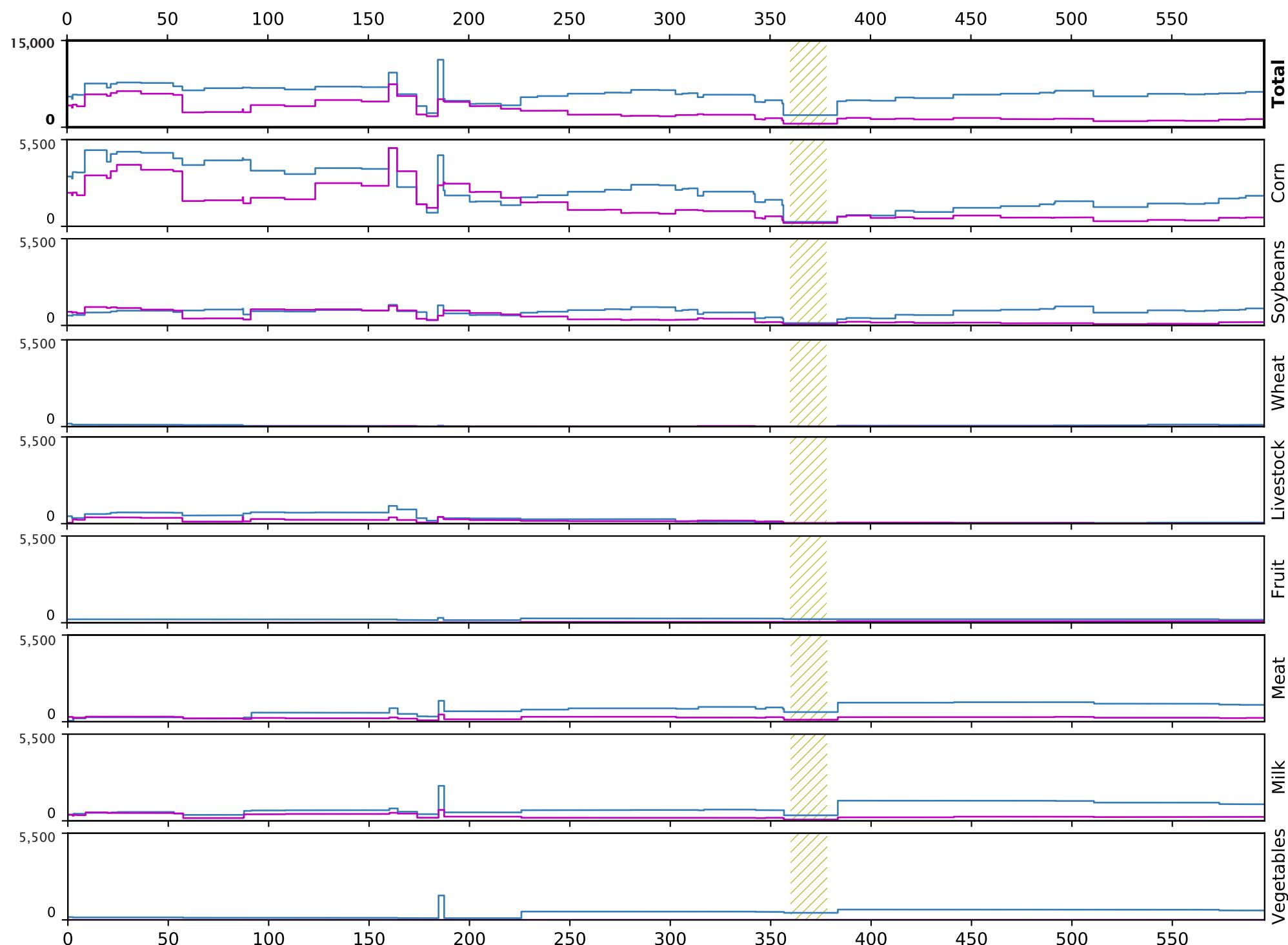


Corridor #16:
Sioux Falls, SD, to St. Louis, MO

TONNAGE (in millions of tons)



Map Legend		Analysis Corridor		Urbanized Area	
+	Grain Elevator	■	Analysis Corridor	●	Urbanized Area
▲	Intermodal Rail Facility	—	Other HDAH Corridors	—	Corridor Mile Marker



TTI > 1.2

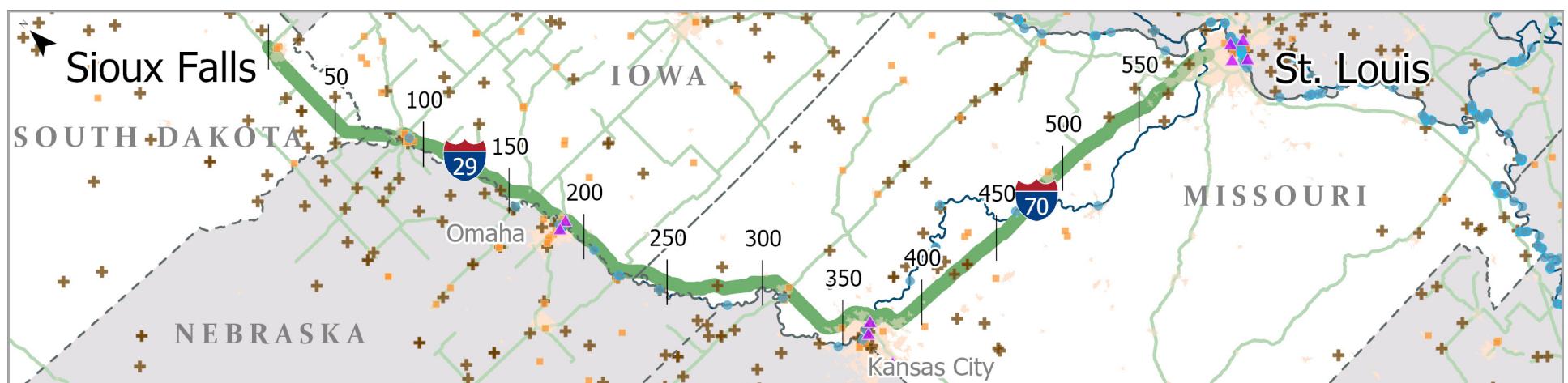
TTTR > 2.0

Sioux Falls to St. Louis

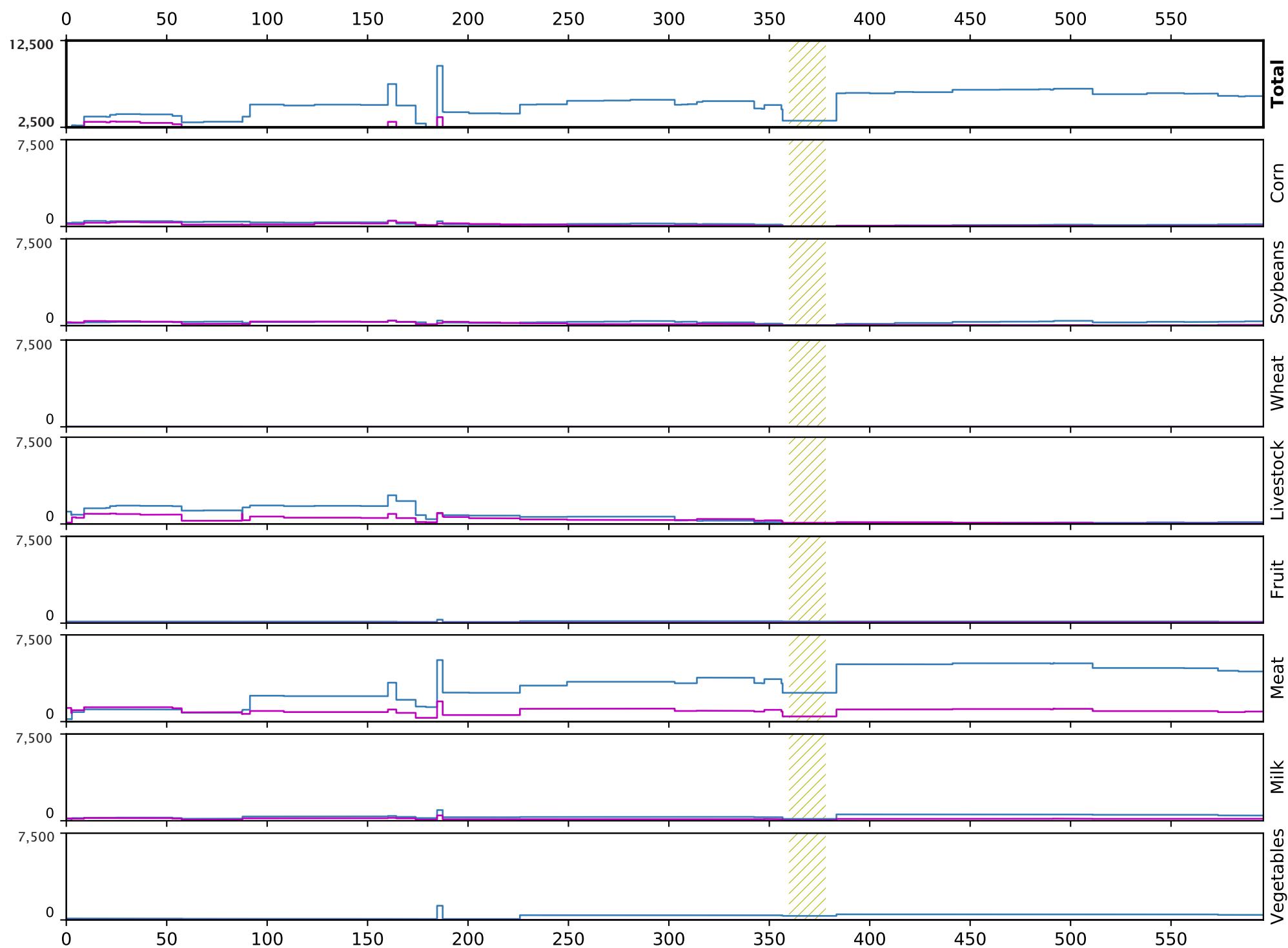
St. Louis to Sioux Falls

Corridor #16:
Sioux Falls, SD, to St. Louis, MO

VALUE (in millions of dollars)

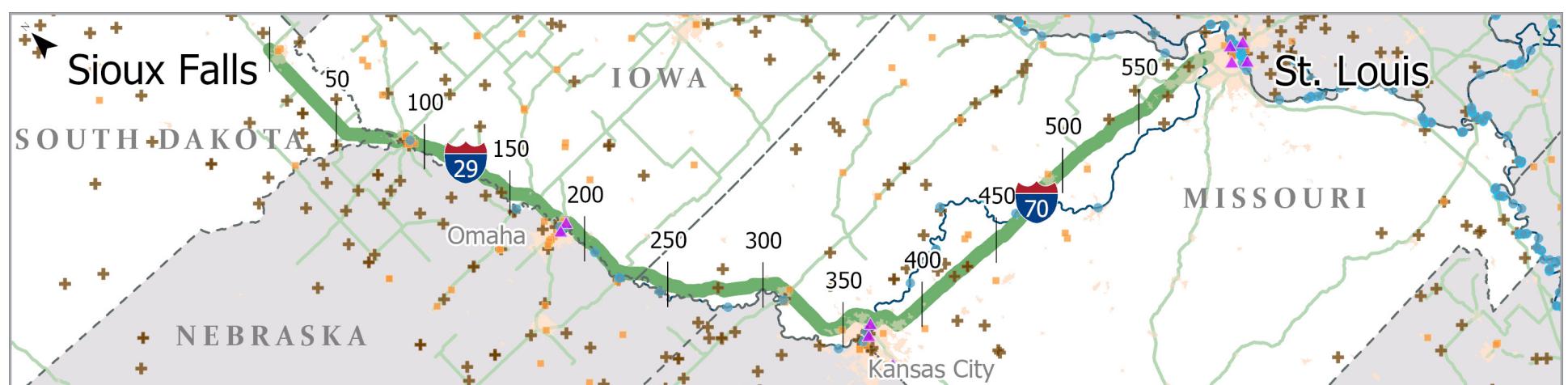


Map Legend	
+	Grain Elevator
▲	Intermodal Rail Facility
■	Meat Processing Facility
●	Coastal or River Port
■	Analysis Corridor
—	Other HDAH Corridors
●	Urbanized Area
—	Corridor Mile Marker



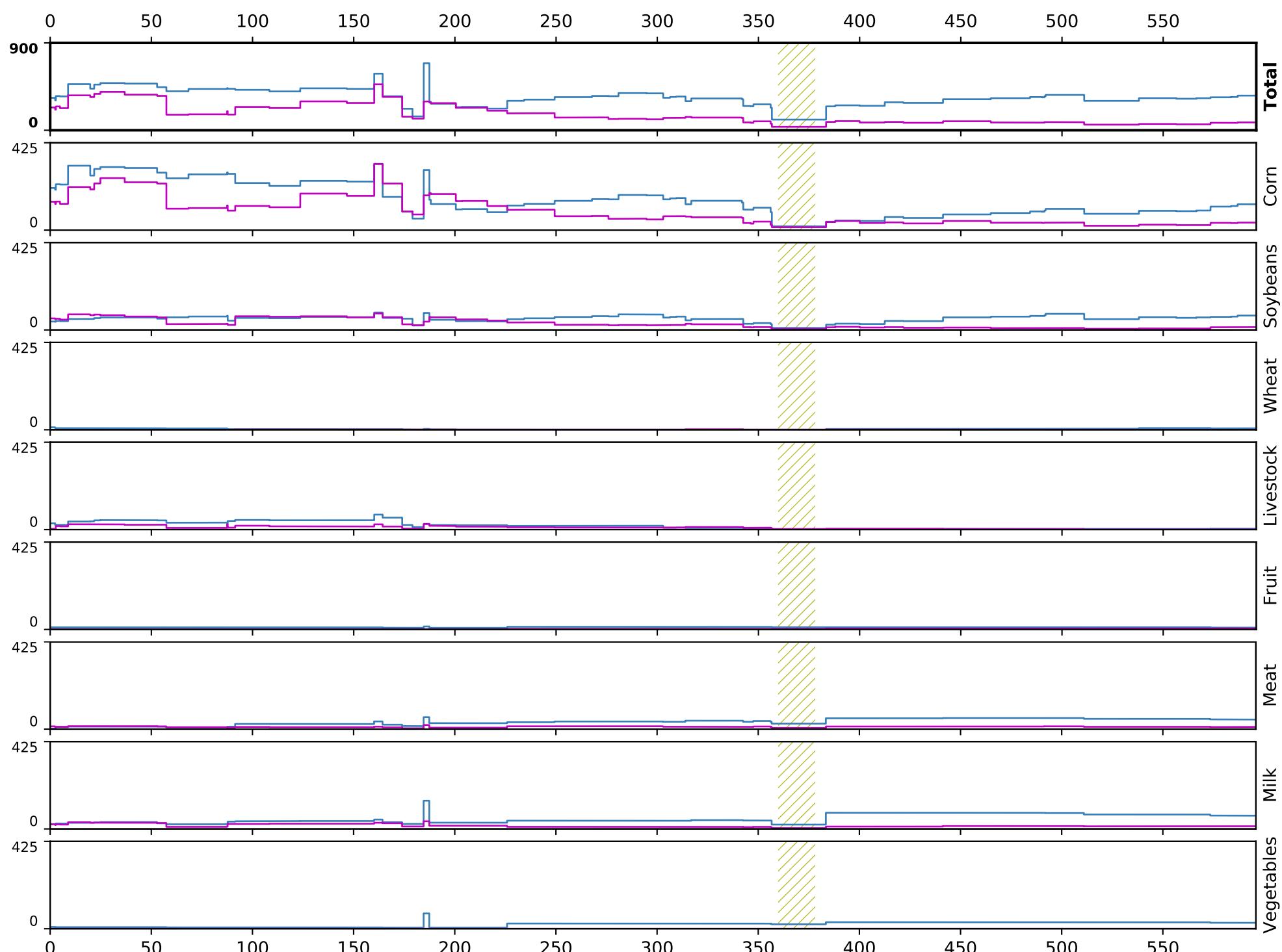
Corridor #16:
Sioux Falls, SD, to St. Louis, MO

UNITS (in thousands of trucks)



Map Legend

- | | | | |
|----------------------------|----------------------------|------------------------|----------------------|
| + Grain Elevator | ■ Meat Processing Facility | ■ Analysis Corridor | ● Urbanized Area |
| ▲ Intermodal Rail Facility | ● Coastal or River Port | — Other HDAH Corridors | Corridor Mile Marker |

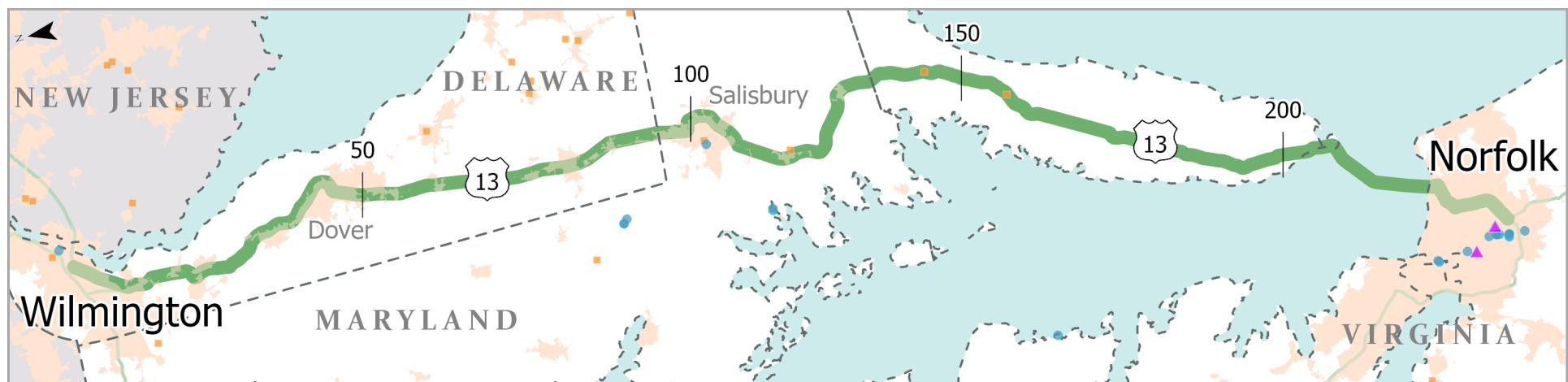


TTI > 1.2

TTTR > 2.0

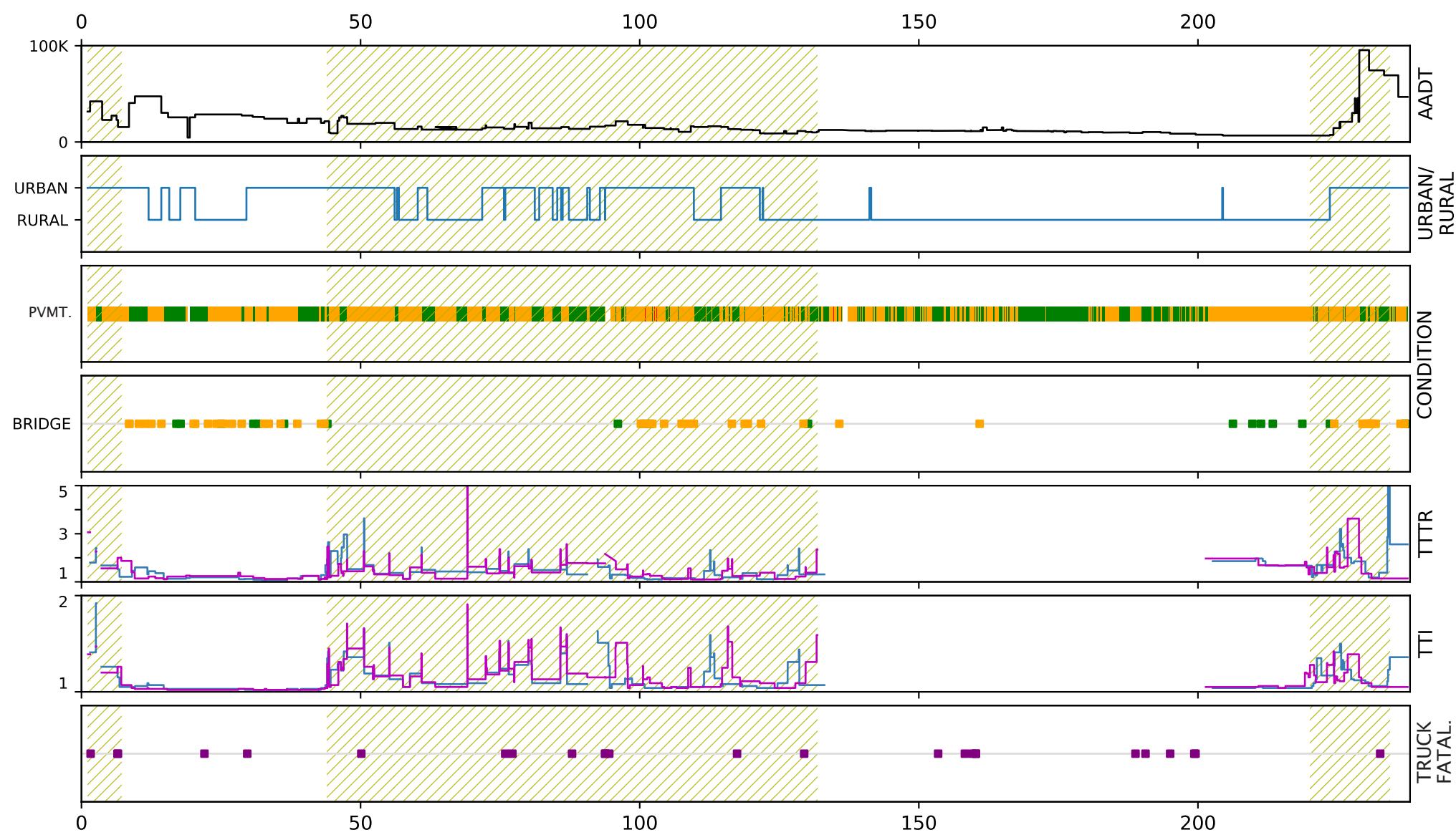
— Sioux Falls to St. Louis

— St. Louis to Sioux Falls



Map Legend

- ⊕ Grain Elevator
- ⊖ Meat Processing Facility
- Analysis Corridor
- Urbanized Area
- ▲ Intermodal Rail Facility
- Coastal or River Port
- Other HDAH Corridors
- | Corridor Mile Marker



DATA LEGEND

Congestion and Reliability

TTI > 1.2

TTTR > 2.0

Bridge and Pavement (PVMT) Condition

■ "Good" Condition

□ "Fair" Condition

■ "Poor" Condition

Traffic Direction (TTTR/TTI)

— Wilmington to Norfolk

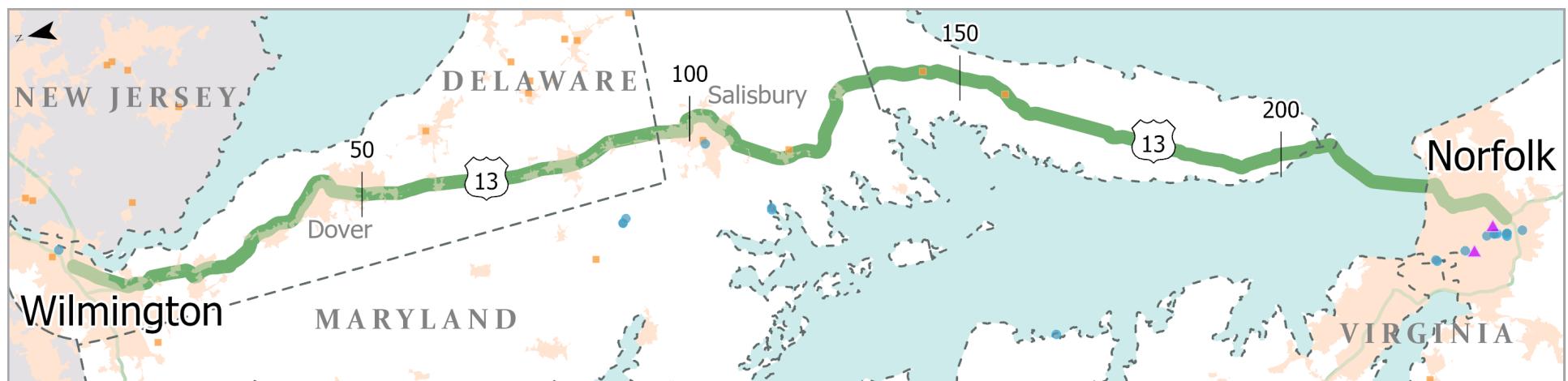
— Norfolk to Wilmington

Safety

■ 1 fatality involving a truck, 2014 - 2018

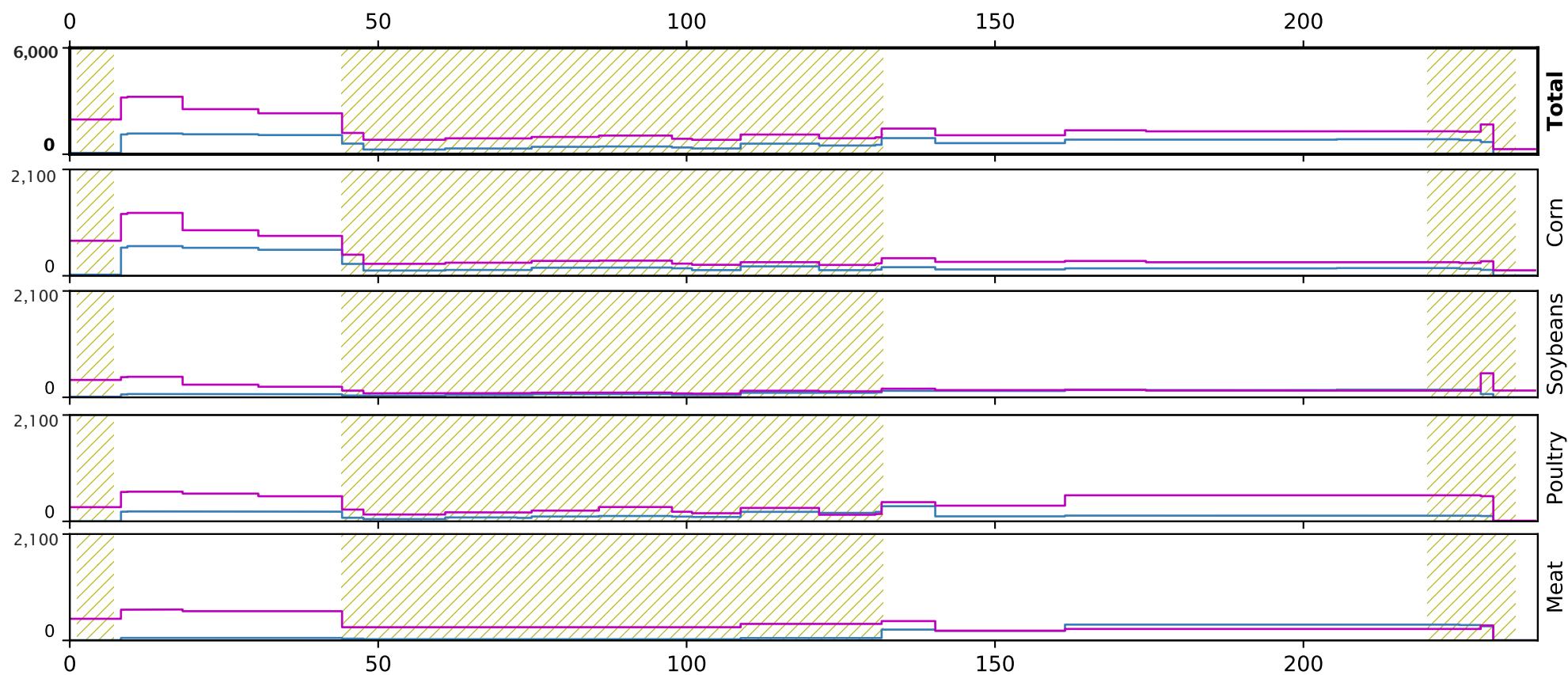
**Corridor #17:
Wilmington, DE, to Norfolk, VA**

TONNAGE (in millions of tons)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ■ | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | — | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



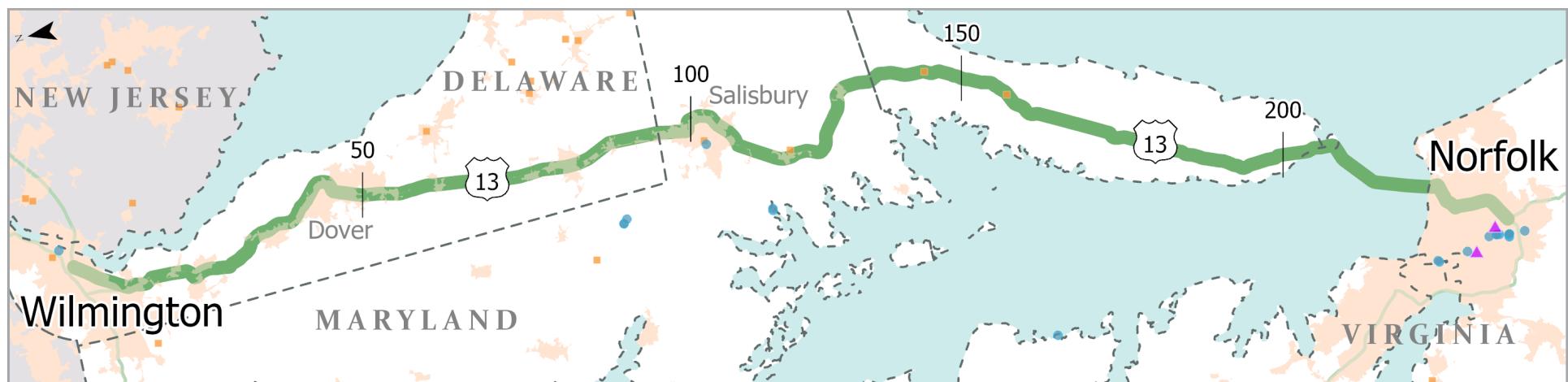
Traffic Direction

— Wilmington to Norfolk

— Norfolk to Wilmington

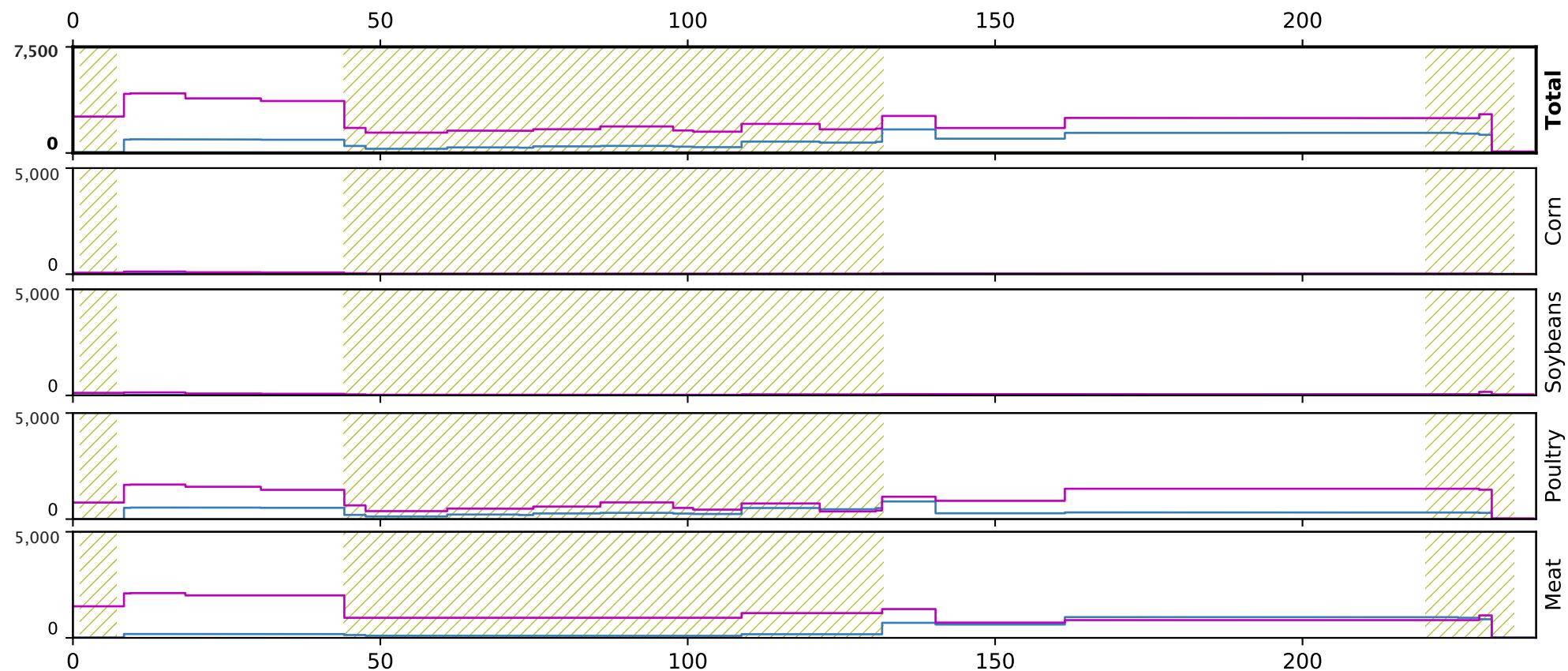
Corridor #17:
Wilmington, DE, to Norfolk, VA

VALUE (in millions of dollars)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ■ | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | — | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



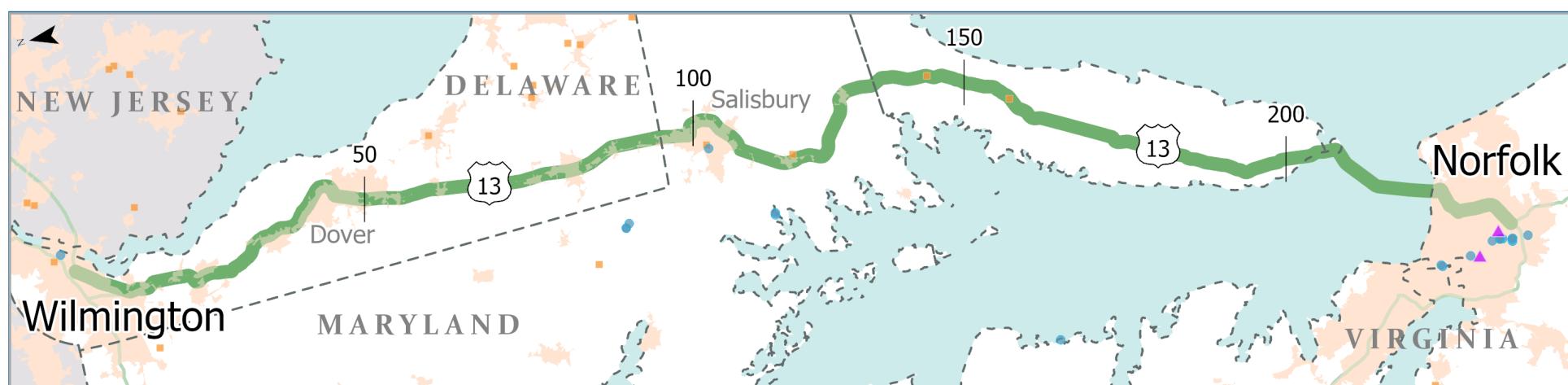
Traffic Direction

— Wilmington to Norfolk

— Norfolk to Wilmington

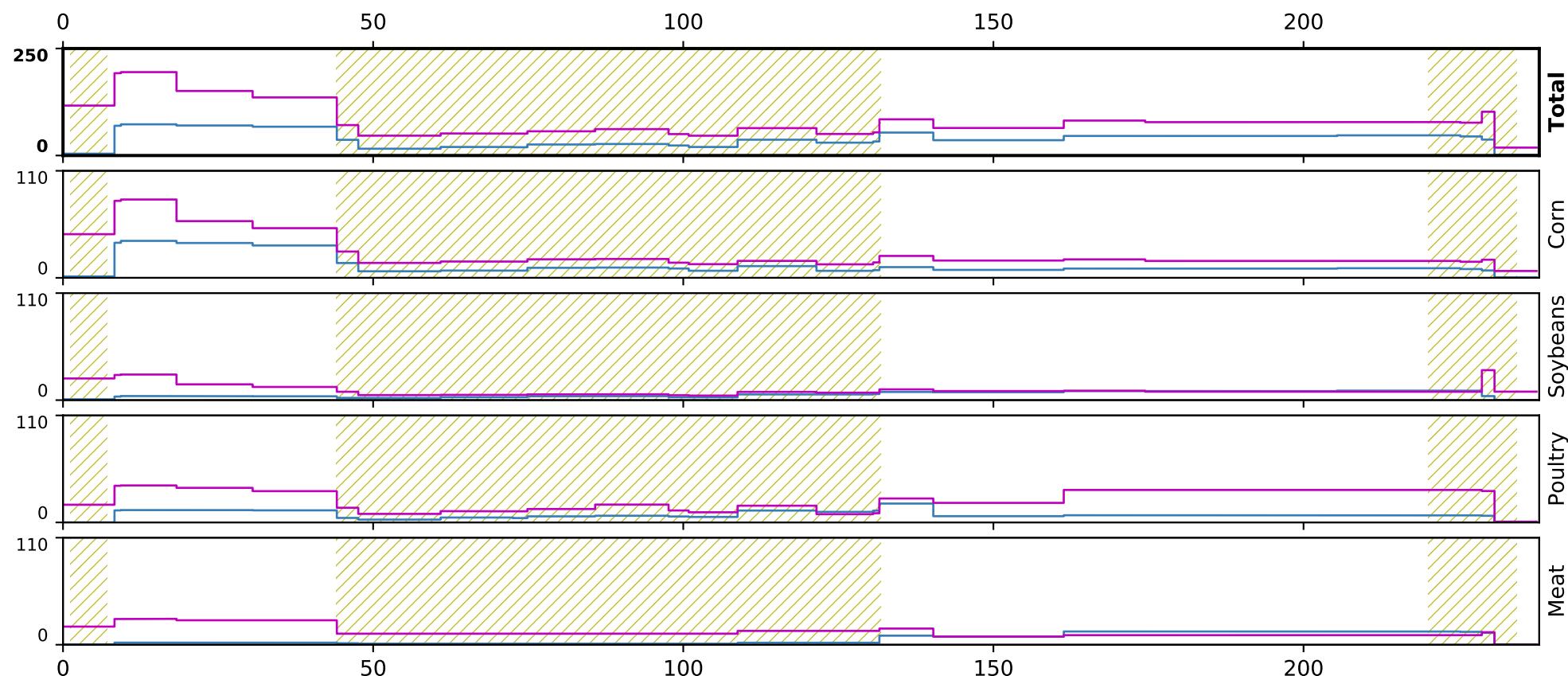
Corridor #17:
Wilmington, DE, to Norfolk, VA

UNITS (in thousands of trucks)



Map Legend

- | | | | | | | | |
|---|--------------------------|---|--------------------------|---|----------------------|---|----------------------|
| + | Grain Elevator | ■ | Meat Processing Facility | ■ | Analysis Corridor | ■ | Urbanized Area |
| ▲ | Intermodal Rail Facility | ● | Coastal or River Port | — | Other HDAH Corridors | — | Corridor Mile Marker |



DATA LEGEND

Congestion and Reliability



Traffic Direction

— Wilmington to Norfolk

— Norfolk to Wilmington

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Appendix B
The Importance of Highways to U.S. Agriculture
<http://dx.doi.org/10.9752/TS295.12-2020>

