

THE ELECTRONIC LOGGING DEVICES MANDATE & POSSIBLE IMPLICATIONS FOR FRESH PRODUCE TRANSPORTATION



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Overview

- Electronic Logging Devices (ELDs) became mandatory for commercial motor carriers (CMV) on December 18, 2017.
- On December 16, 2019, ELDs will become mandatory for produce haulers.
- Hours of service laws (HOS) have not changed.
- The primary purpose:
 - To ensure better compliance with existing hours of service (HOS) requirements.

Overview

The new mandate and the agriculture exemption provides an advantage to producers, but highway safety comes at a cost.

We will:

1. Describe the mandate
2. Review HOS rules
3. Clarify agricultural exceptions to the HOS rules
4. Offer a preliminary discussion as to how ELDs could affect fresh produce transportation costs.



Electronic Logging Devices (ELDs)

1980s—ELDs were introduced



2012—Congress required that all CMV hauling freight be equipped with ELDs



2015—Final ELD rule was published in December 2015



Implementation

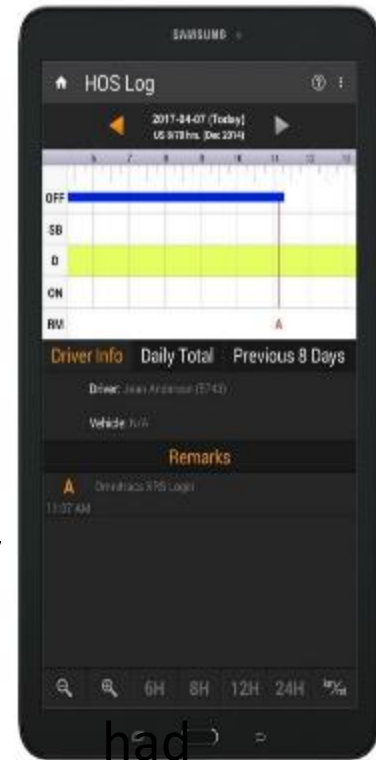
2015-2017—Phase 1: transition period; ELDs were voluntary



2017-2019—Phase 2: all trucks must install ELDs unless they previously installed an alternative logging device



2019—Phase 3: Begins after December 16, 2019; requires all drivers and carriers to use self-certified ELDs that are registered with FMCSA



Hours of Service (HOS) Rules



- **11-Hour Driving Limit:** CMVs may drive a maximum of 11 hours after 10 consecutive hours off duty
- **14-Hour Limit:** CMVs may not drive beyond the 14th consecutive hour following 10 consecutive hours off duty
- On duty includes loading
- **Rest Breaks:** A 30-minute rest break after 8 hours of driving is required
- **60/70-Hour Limit:** May not drive after 60/70 hours on duty in 7/8 consecutive days.

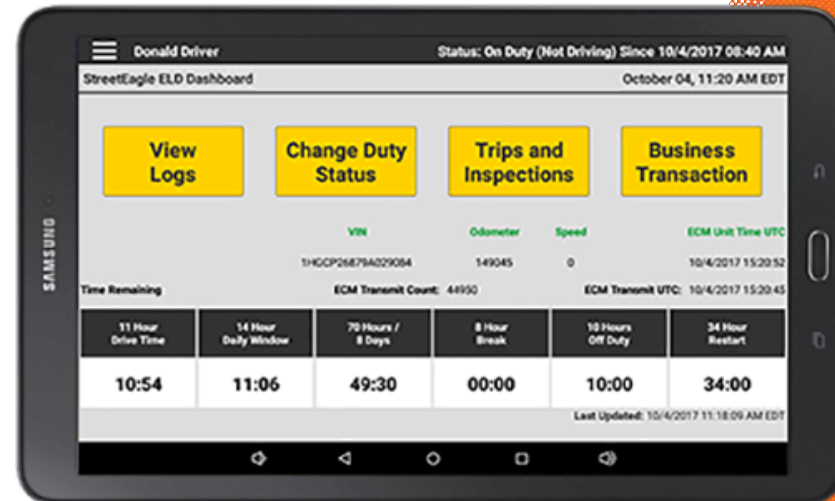
Electronic Logging Devices (ELDs)

REQUIREMENTS

1. Connect directly to the truck's engine and provides a continuous record while the CMV is operating
2. Allow a driver to select "on-duty, driving," "on-duty, not driving," and "off-duty"
3. Quickly provide law enforcement with a graphical display of the driver's record of duty service
4. Transfer data via a wireless system or with USB drives.

EXEMPTIONS

1. CMVs older than model year 2000
2. Drivers who do not operate outside the HOS limits for more than 8 out of 30 days



AGRICULTURAL EXEMPTIONS !

CMV drivers can haul agricultural products within 150 air-miles (173 ground miles) of the agricultural source

Agricultural Products

Crop and Livestock Commodities

Equipment

Seed

Fertilizer

Other Production Material

Records are important: Drivers must maintain records of duty status for seven consecutive days plus the current day.

- Logbooks or ELDs must be annotated “agricultural exemption”

Agricultural Source

The *originating location* from where agricultural products are hauled

- ❑ The agricultural source depends on what is being shipped and when the shipment occurs
- ❑ The commodity CANNOT be altered through processing, e.g., juice, canning
- **Nursery:** Moving plants from a transplant house to the field makes the nursery an “agricultural source”



Agricultural Source

- **Field:** Hauling harvested fruit to the packinghouse
- **Packinghouse:** Moving commodities between packinghouses and other destinations within the supply chain
 - While a fresh market tomato is graded and ripened at a packinghouse, its condition is fundamentally the same

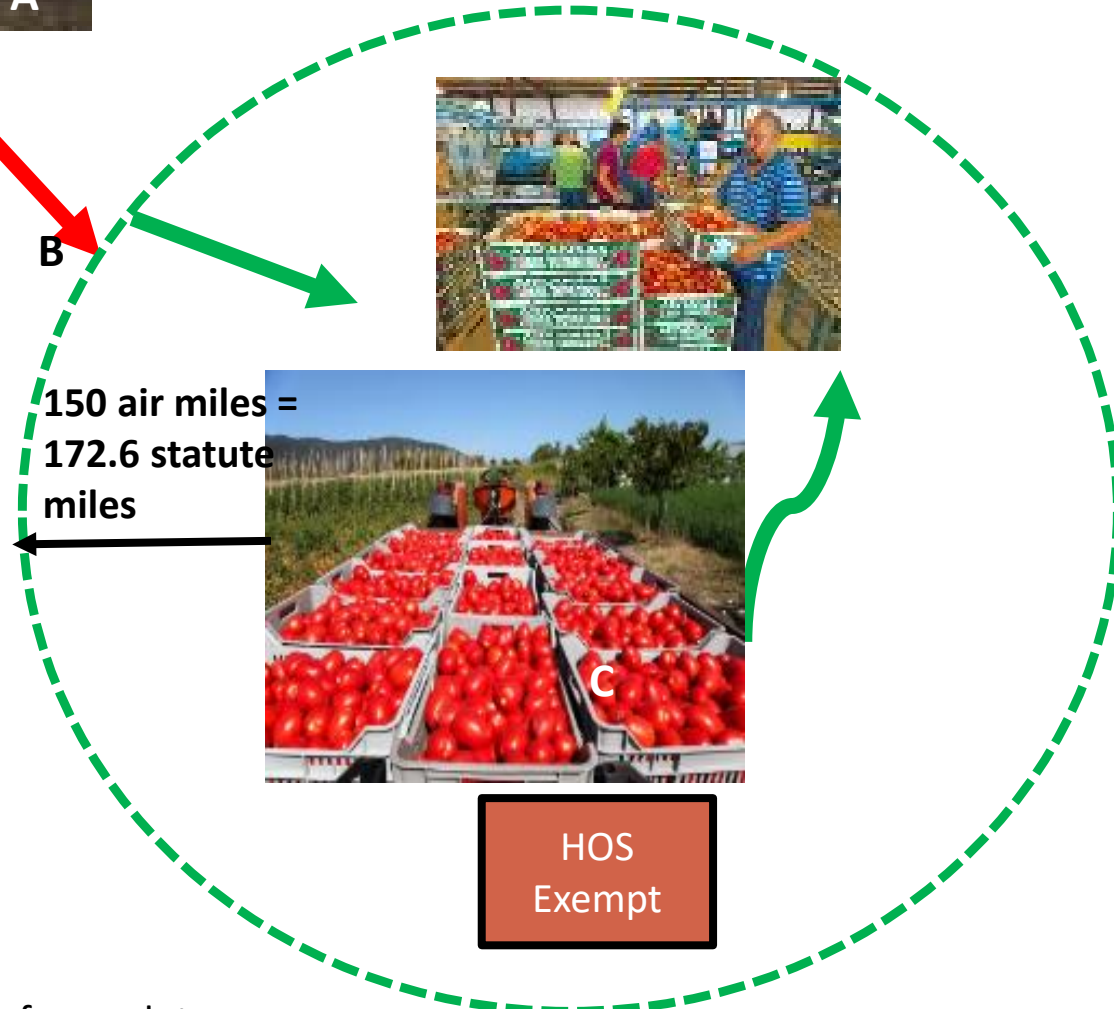


Hours of Service Exemption Example: Empty to source



A

Time counts towards HOS



150 air miles =
172.6 statute
miles



HOS
Exempt

- A - Start of trip
- B - 150 Air-Mile Radius
- C - Agricultural Source
- D - Destination

A - B Empty to within 150 miles of source.

B - C Empty to source within radius of source.

C - D Loaded source to destination within 150 miles.



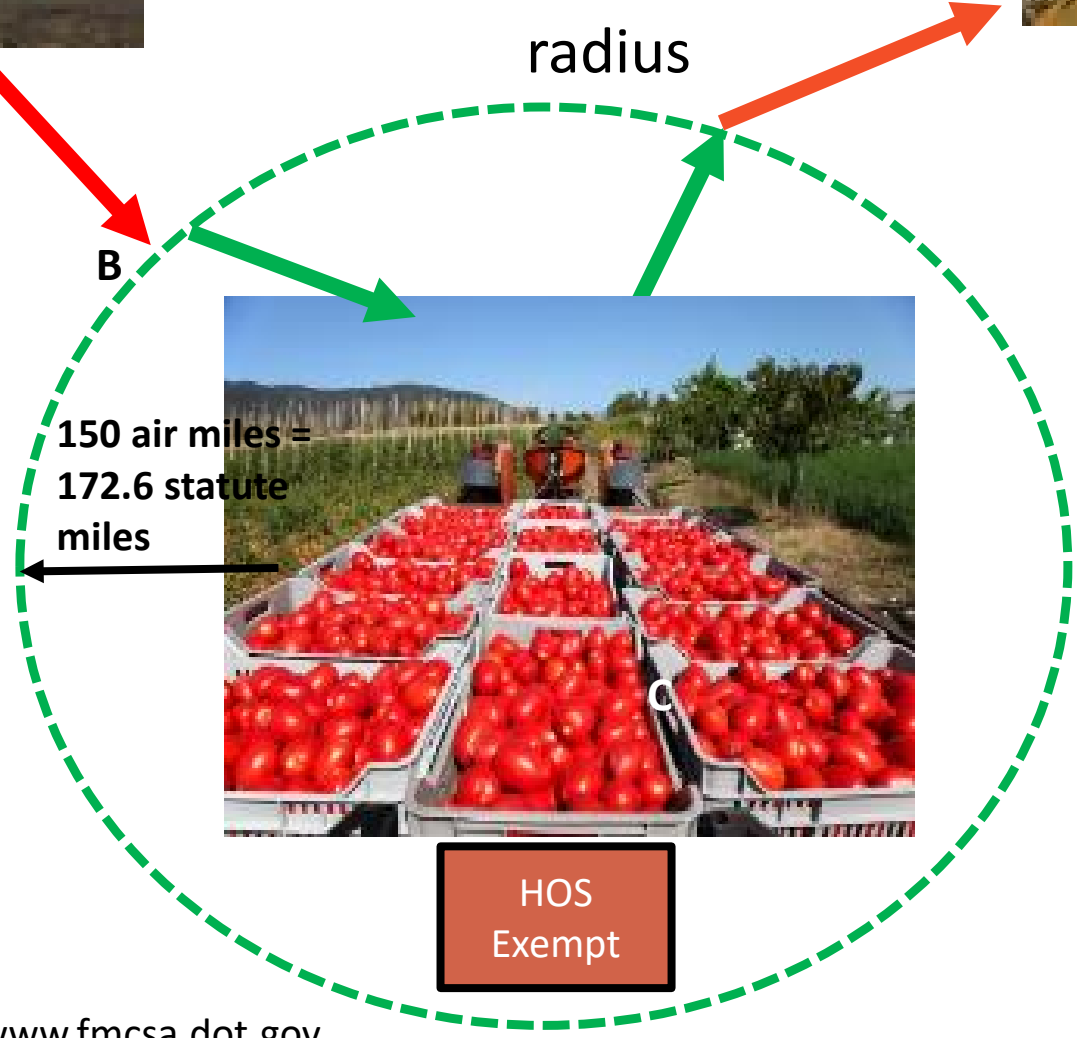
A

Hours of Service Exemption Example: Destination outside of radius



D

Time counts towards HOS



A - Start of trip
B - 150 Air-Mile Radius
C - Agricultural Source
D - Destination

A - B Empty to within 150 miles of source.

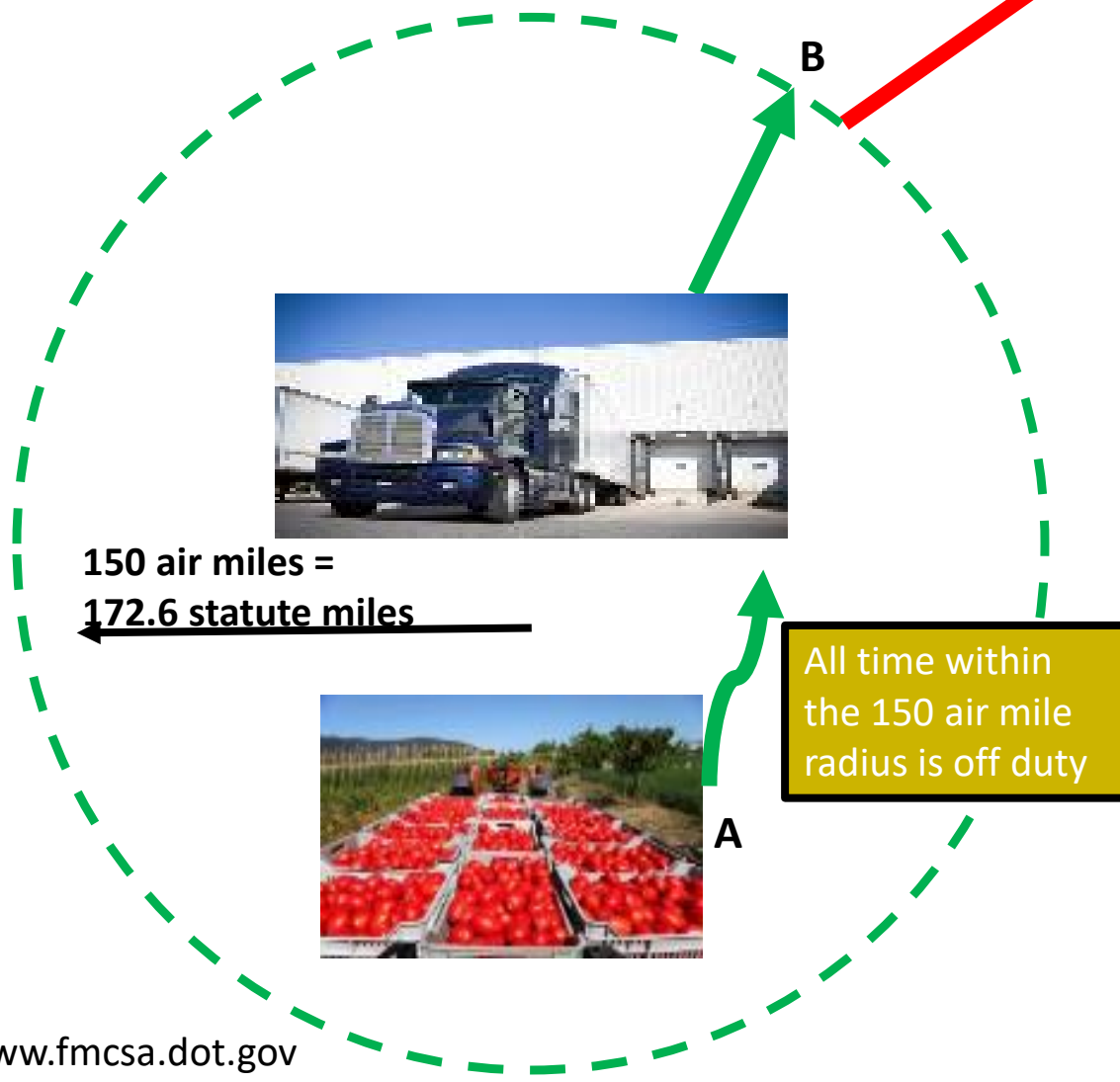
B - C Empty to source within radius of source.

C - D Loaded source to destination outside 150 miles.

Hours of Service Exemption Example: Commodities to market



Time counts towards HOS



A - Start of trip
B - 150 Air-Mile Radius
C - Destination

A - B Loaded within 150 miles of source.
B - C Loaded to destination outside 150 miles.

Hours of Service Exemption Example:

Return empty from delivery



Time counts towards HOS

A - Agricultural Source
B - 150 Air-Mile Radius
C - Destination
D - 150 Air-Mile Radius
E - Agricultural Source

A - B Loaded within 150 miles of source.
B - C Loaded to destination outside 150 miles.
C - D Empty returning to zone; HOS apply outside of radius.
D - E Empty returning within zone; exempt inside radius.

150 air miles =
172.6 statute miles



All time within the 150 air mile radius is off duty

Hours of Service Exemption Example:

Starting a new trip without
returning to the original source

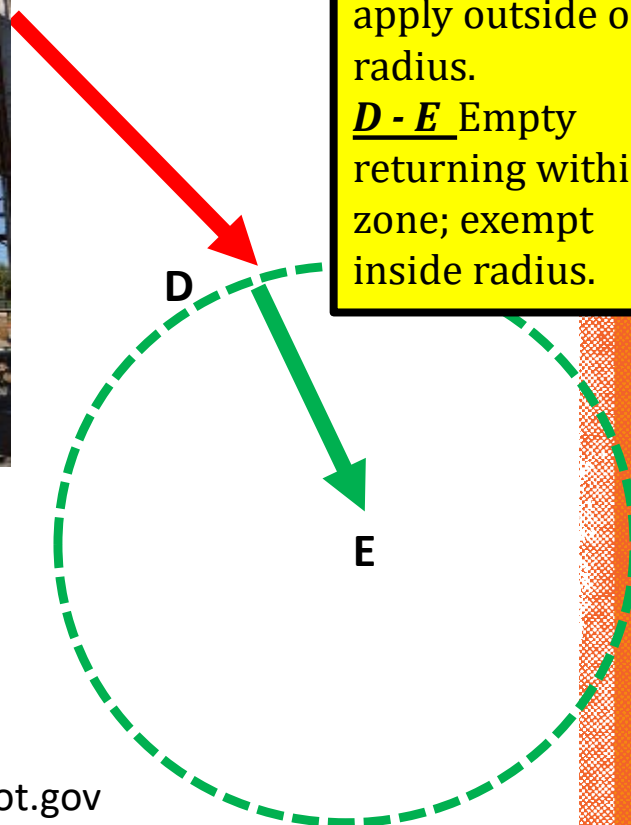
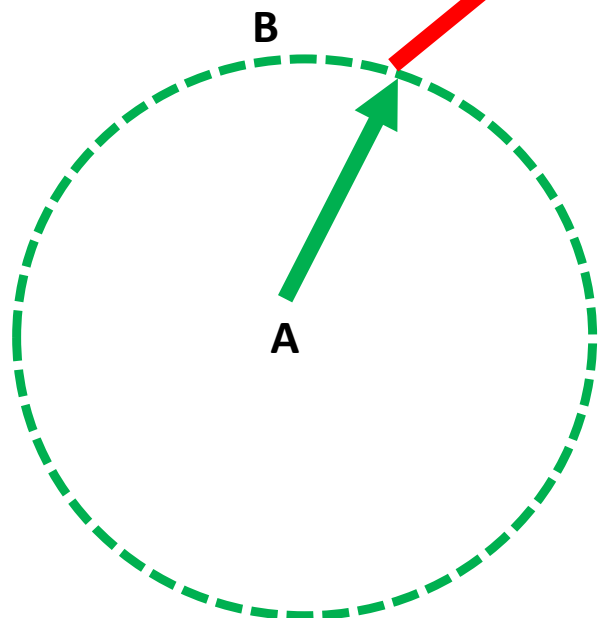
A - Agricultural
Source
B - 150 Air-Mile
Radius
C - Destination
D - 150 Air-Mile
Radius
E - New
Agricultural
Source

A - B Commodity
to processor;
exempt within
radius.

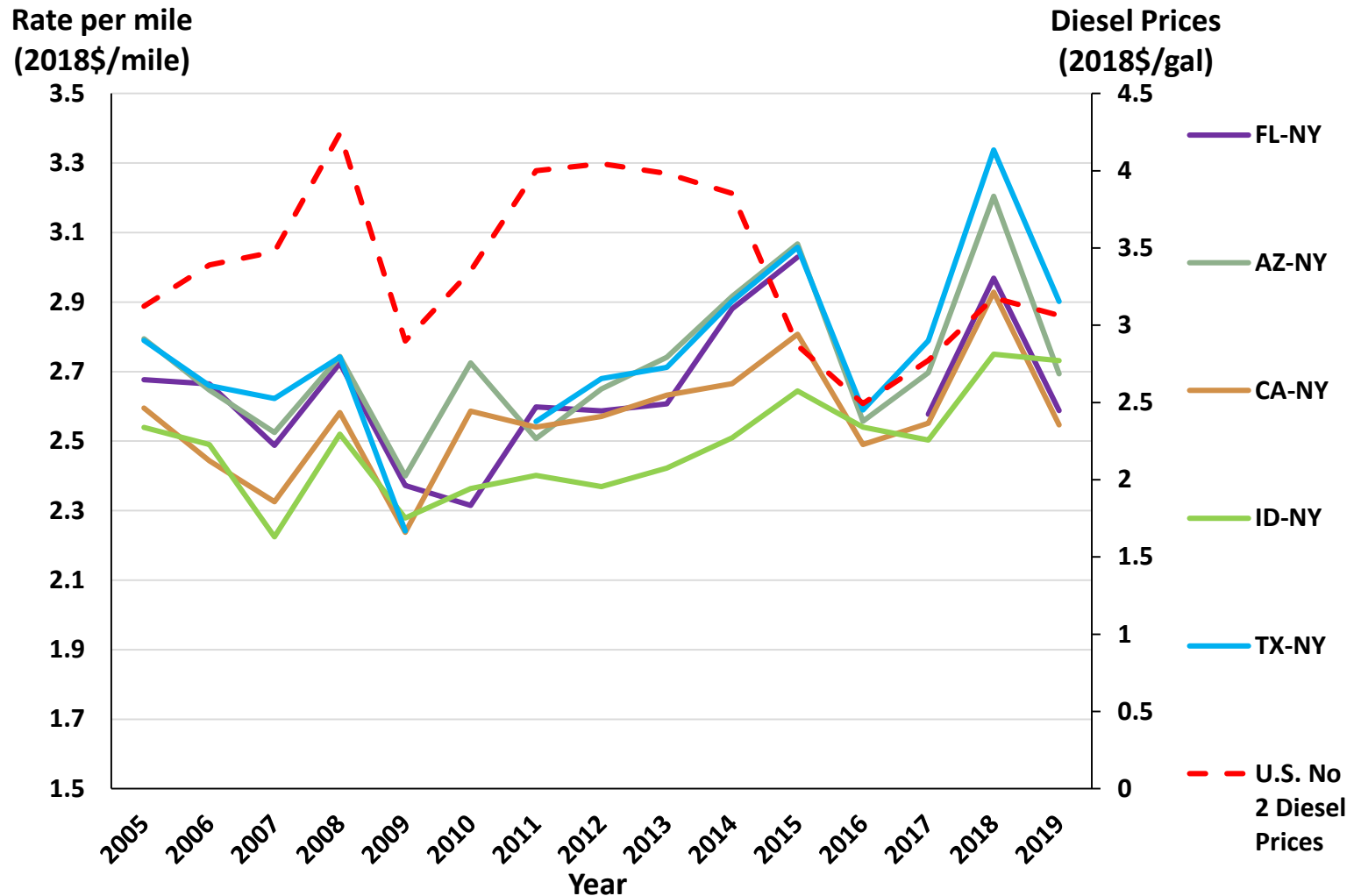
B - C Commodity
to processor; HOS
apply outside
radius.

C - D New Trip;
Empty returning
to zone; HOS
apply outside of
radius.

D - E Empty
returning within
zone; exempt
inside radius.



Truck Rates per Mile: Shipments to NY

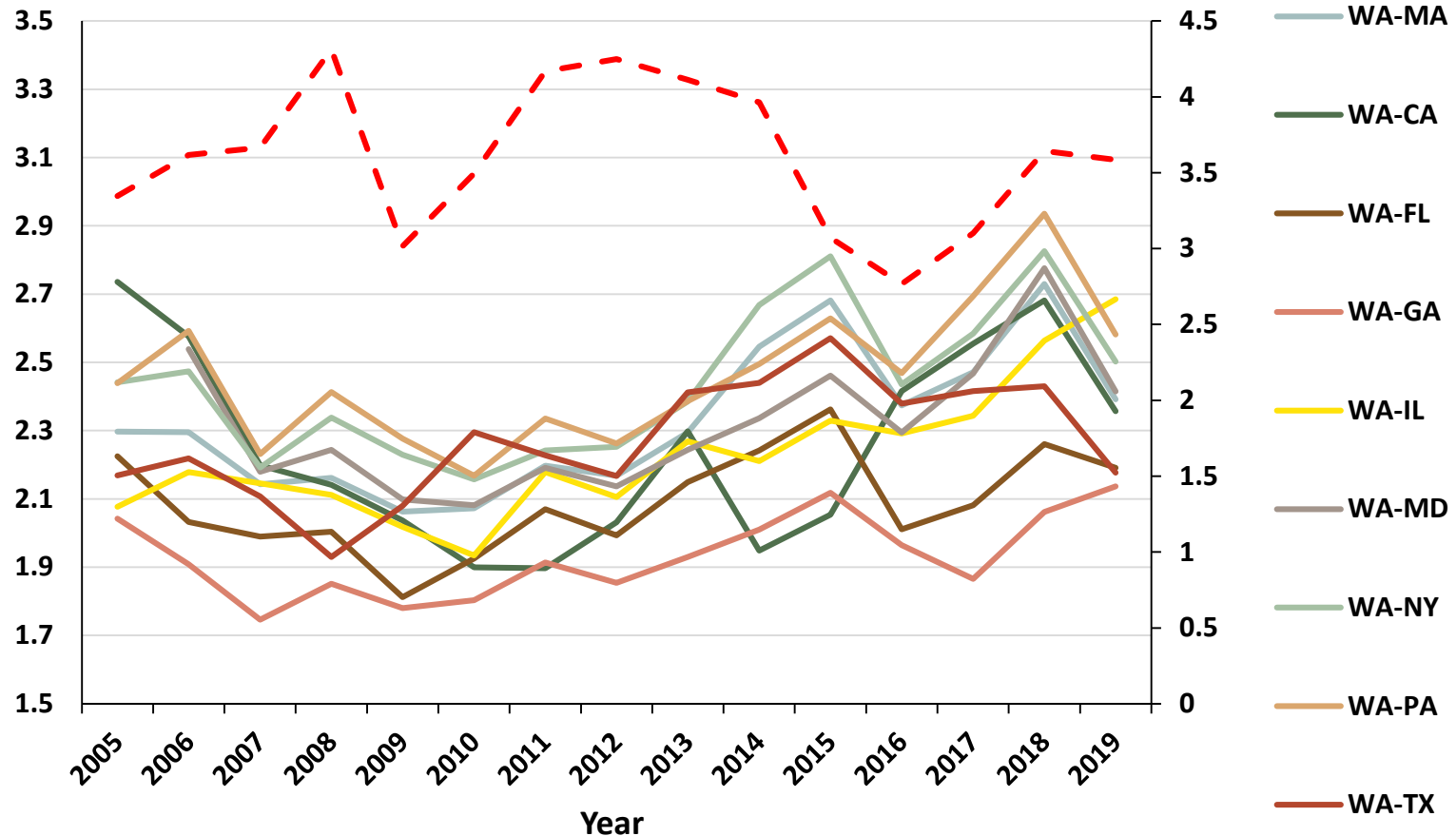


Sources: U.S. Department of Agriculture, Agricultural Marketing Service, Truck Rate Report (<https://www.ams.usda.gov/market-news/fruits-vegetables>); Energy Information Administration (eia.gov/oog/info/wohdp/diesel.asp); truckrouter.com

Truck Rates Per Mile: Shipments from WA

Rate per mile
(2018\$/mile)

Diesel Prices
(2018\$)

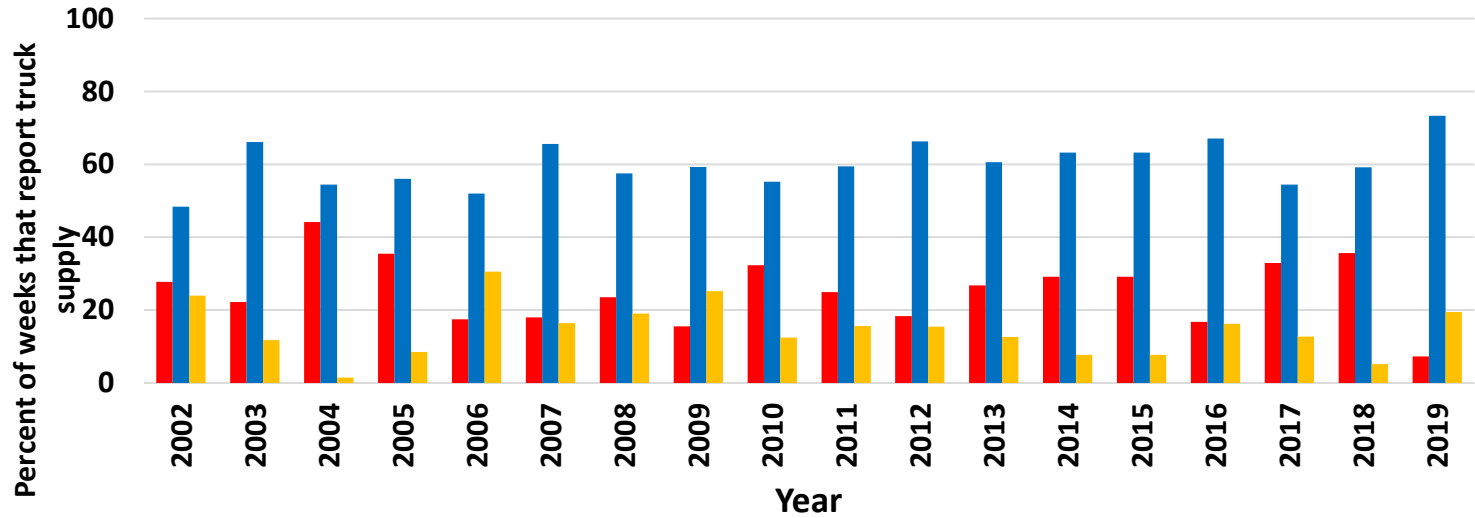


Sources: U.S. Department of Agriculture, Agricultural Marketing Service, Truck Rate Report (<https://www.ams.usda.gov/market-news/fruits-vegetables>); Energy Information Administration (eia.gov/oog/info/wohdp/diesel.asp); truckrouter.com

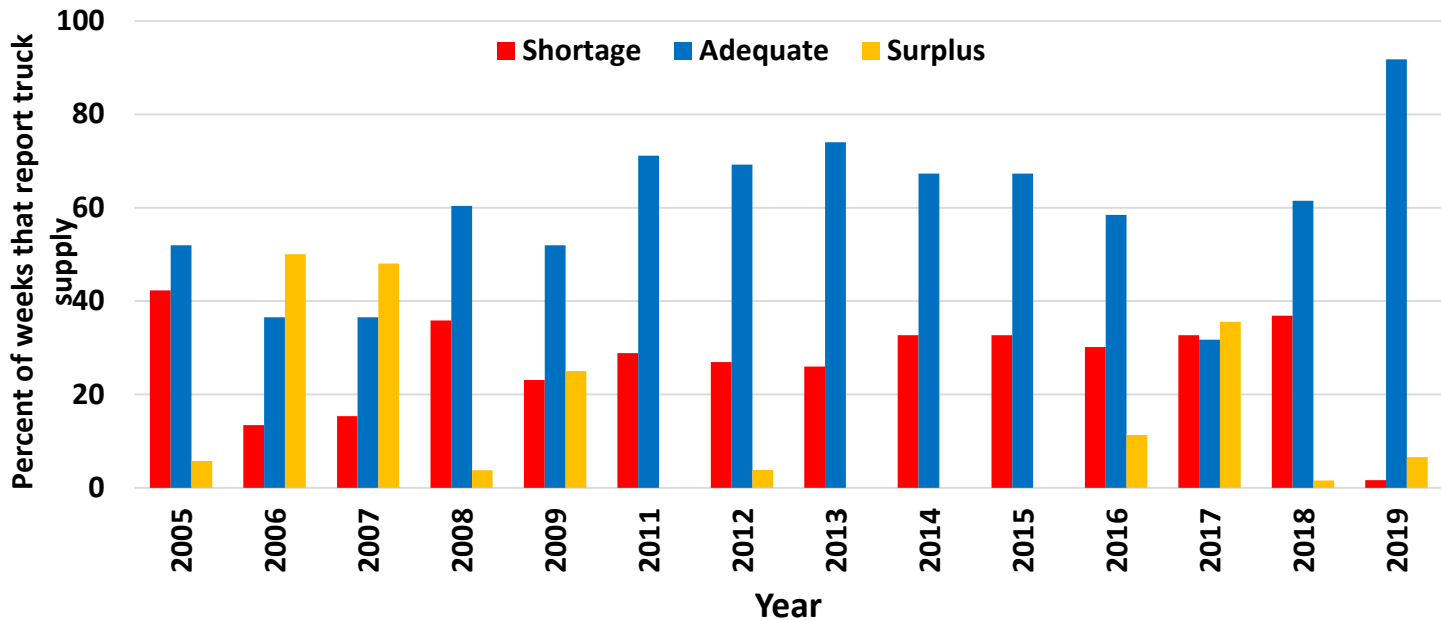
Red dashed line: West Coast No.2 Diesel Retail

Shortages may affect costs

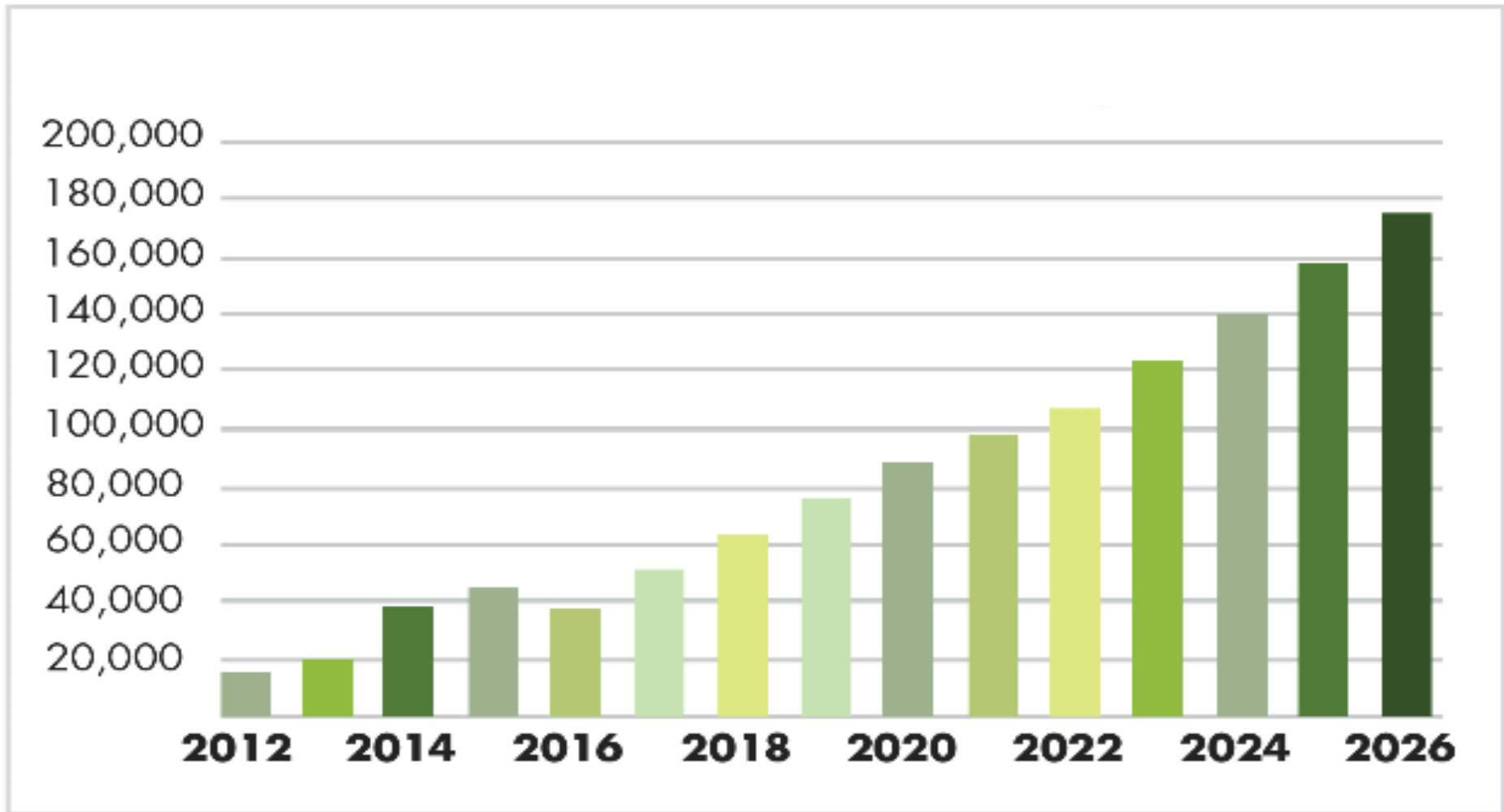
National



Washington



Truck Driver Shortage



Source: Driver Shortage Analysis 2017, American Trucking Association

Business as Usual Time vs. Hours of Service Compliant

Business as usual calculations

t_0 = Original trip time

t_{BHS} = BAU hours

t_{BAU} = BAU trip time

$$t_{BAU} = t_0 + (t_F * (24 - t_{BHS})),$$

where $t_F = \left\lfloor \frac{t_0}{t_{BHS}} \right\rfloor$

Hours of service calculations

t_{MHS} = ELD mandated hours

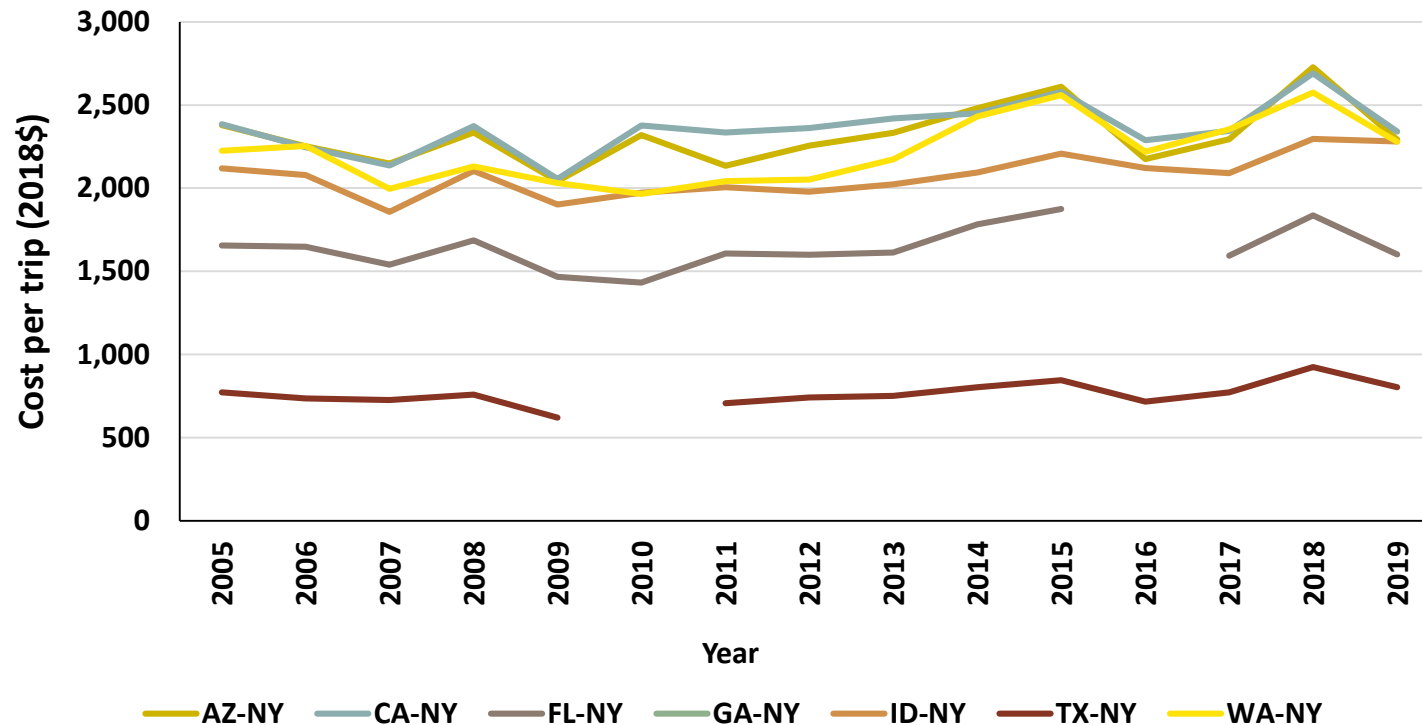
t_{ELD} = ELD mandated trip time

$$t_{ELD} = t_0 + (t_F * (24 - t_{MHS})),$$

where $t_F = \left\lfloor \frac{t_0}{t_{MHS}} \right\rfloor$

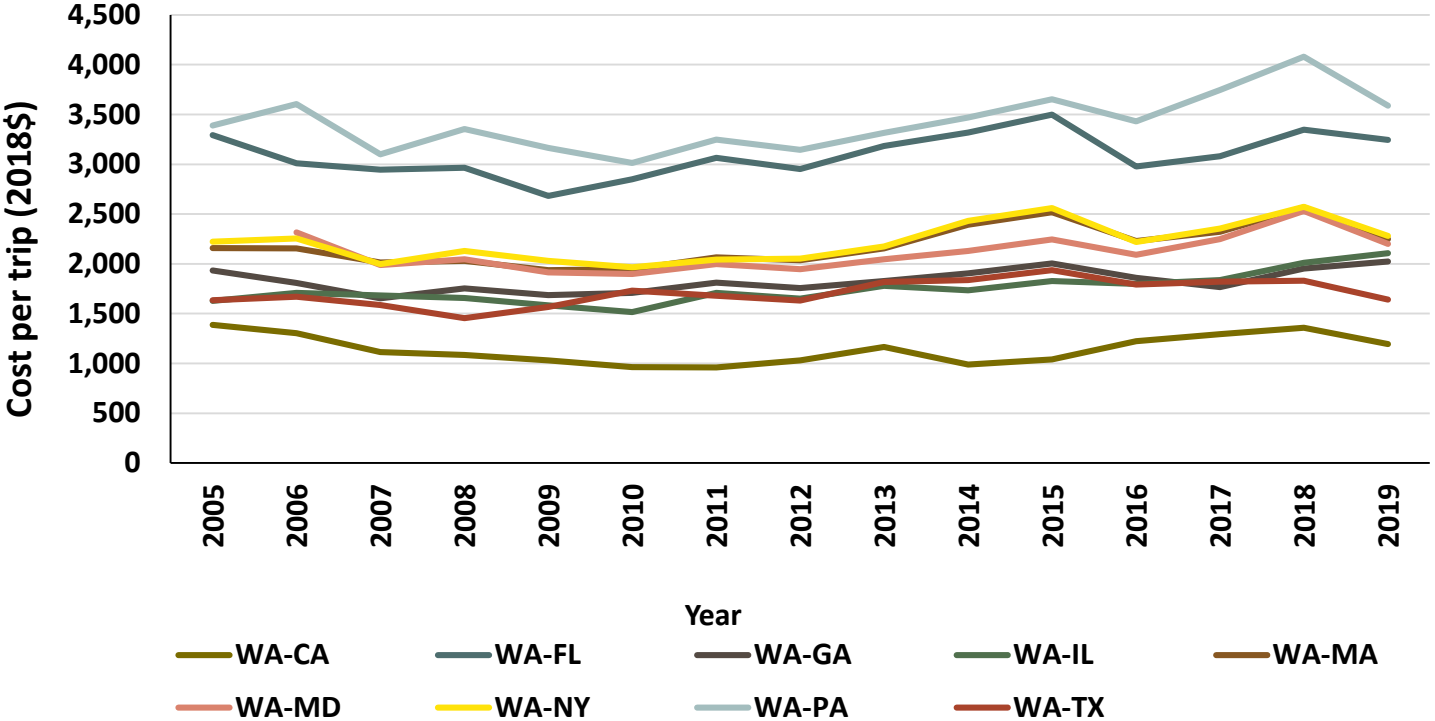
Origin-Destination	Distance (miles)	Additional Time (hrs)	Additional Time (%)
AZ-NY	2,339.9	21	36.8
CA-NY	2,778.3	25	33.3
FL-NY	1,187.5	17	53.1
GA-NY	996.5	4	13.8
ID-NY	2,275.2	21	36.8
TX-NY	1,724.1	8	16.3
WA-CA	958.4	17	53.1
WA-FL	3,245.5	38	45.8
WA-GA	2,962.5	25	32.1
WA-IL	1,925.9	21	41.2
WA-MA	2,918.3	25	32.5
WA-MD	2,681.9	25	34.2
WA-NY	2,708.1	25	33.8
WA-PA	2,544.2	34	54.8
WA-TX	1,974.2	21	38.2

Total Cost of Hours of Service Rules Relative to Business as Usual



Source: : U.S. Department of Agriculture, Agricultural Marketing Service, Truck Rate Report (<https://www.ams.usda.gov/market-news/fruits-vegetables>)

Total Cost of Hours of Service Rules Relative to Business as Usual: Shipments from WA



Source: : U.S. Department of Agriculture, Agricultural Marketing Service, Truck Rate Report (<https://www.ams.usda.gov/market-news/fruits-vegetables>)

Social Cost-Emissions

Transport Refrigeration unit (TRU) Emissions Calculations

t_{BAU} = BAU trip time

t_{ELD} = ELD mandated trip
time

G = TRU GHG emissions

c = EPA conversion factor
(kg/hour)

$$\Delta G = c * (t_{ELD} - t_{BAU})$$

Origin-Destination	CO ₂	VOC	NOx	TRU
AZ-NY	538.2	72.6	709.0	231.2
CA-NY	640.7	86.4	844.1	275.3
FL-NY	435.7	58.7	574.0	187.2
GA-NY	102.5	13.8	135.1	44.0
ID-NY	538.2	72.6	709.0	231.2
TX-NY	205.0	27.6	270.1	88.1
WA-CA	435.7	58.7	574.0	187.2
WA-FL	973.9	131.3	1283.0	418.4
WA-GA	640.7	86.4	844.1	275.3
WA-IL	538.2	72.6	709.0	231.2
WA-MA	640.7	86.4	844.1	275.3
WA-MD	640.7	86.4	844.1	275.3
WA-NY	640.7	86.4	844.1	275.3
WA-PA	871.4	117.5	1147.9	374.3
WA-TX	538.2	72.6	709.0	231.2

Sources: EDF (business.edf.org/files/2014/07/EDF-Green-Freight-Handbook.pdf); EPA (epa.gov/sites/production/files/documents/CompilationofStateIdlingRegulations.pdf); Cornell University (publications.dyson.cornell.edu/docs/smartMarketing/pdfs/SmrtMkgMar2016-IV.pdf)

Possible Implications for Agriculture

The agriculture industry has several concerns:

- Limited flexibility and not making on-time deliveries
 - HOS don't account for road construction, traffic, accidents, weather, parking, etc.
- Increased food waste due to increased contamination risks
- Increased refrigeration costs as drivers will be off duty for longer periods
- Increased pair driving to ensure on-time deliveries
- Possible switches in rate structures to reflect longer travel times to attract more drivers to the industry
- Increased CO₂ emissions related to refrigeration costs

For researchers:

- How do we address these issues?
- Can we address them effectively given we need a time lag for analysis?

Summary

- ELDs are mandated across a large portion of the freight industry, including trucks hauling fresh produce.
- The primary purpose of ELDs are to ensure that motor carriers and their drivers follow HOS rules.
- The agricultural exemption provides agricultural producers and haulers a radius of 150 air-miles in which HOS and ELDs are not required.
- The 2018 cost estimates show an increase in per mile costs over time.
 - While the ELD mandate will increase travel time there is no clear indication that it will affect already raising transportation costs.
- There is an argument that the information ELDs provide could improve overall freight logistics and hauling efficiencies
- More robust analysis is needed.

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QUESTIONS



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