

Linking Carrier Descriptive Attributes to Crash Patterns

A Joint Study Sponsored by

The Virginia Department of Transportation

and

The North Carolina Department of Transportation

and conducted by



ITRE

Institute for Transportation Research and Education
at North Carolina State University



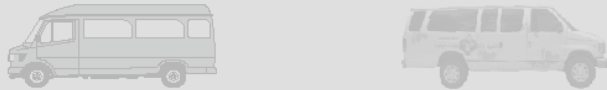
R. M. Clarke Consulting

The 'vehicle' focus of the study

(A 'subset' of commercial motor vehicles)

Vehicle Configuration

Bus (9-15 Seats, Including Driver)



Bus (16 or More Seats, Including Driver)



Single-Unit (2 Axles, 6 Tires)



Single-Unit (3 or More Axles)



Truck/Trailer (Single-Unit Truck Pulling a Trailer)



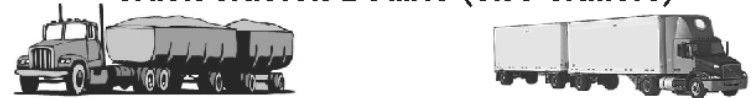
Truck Tractor (Bobtail)



Tractor/Semi Trailer (One Trailer)



Truck Tractor/Double (Two Trailers)

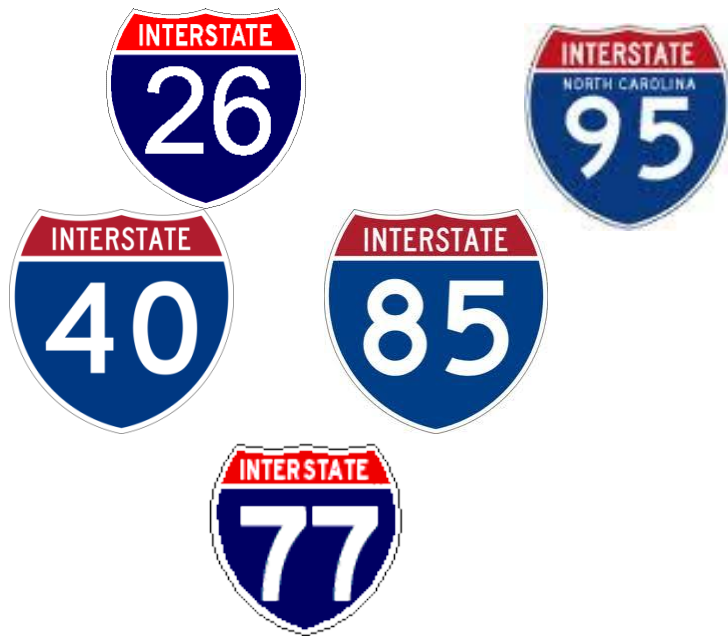


Truck Tractor/Triple (Three Trailers)



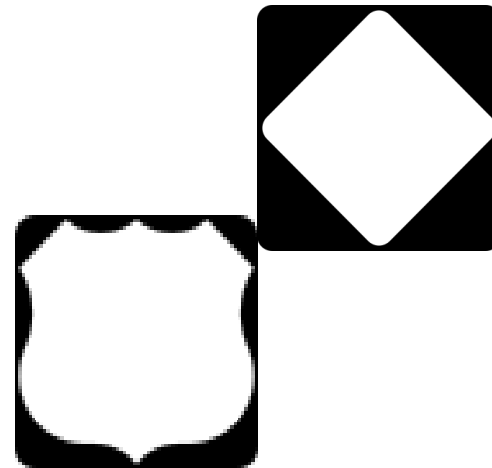
Focus on Two Major Classes of Roadways

Interstate



Non-Interstate

(US, NC, SR)



Focusing on the NC Portion of the Results

- Focus on Crash Data (TEAAS 2005-2009)



- Focus on Carrier Attributes from MCS-150

MOTOR CARRIER IDENTIFICATION REPORT
(Application for U.S. DOT Number)



ITRE
Institute for Transportation Research and Education
at North Carolina State University



R. M. Clarke Consulting

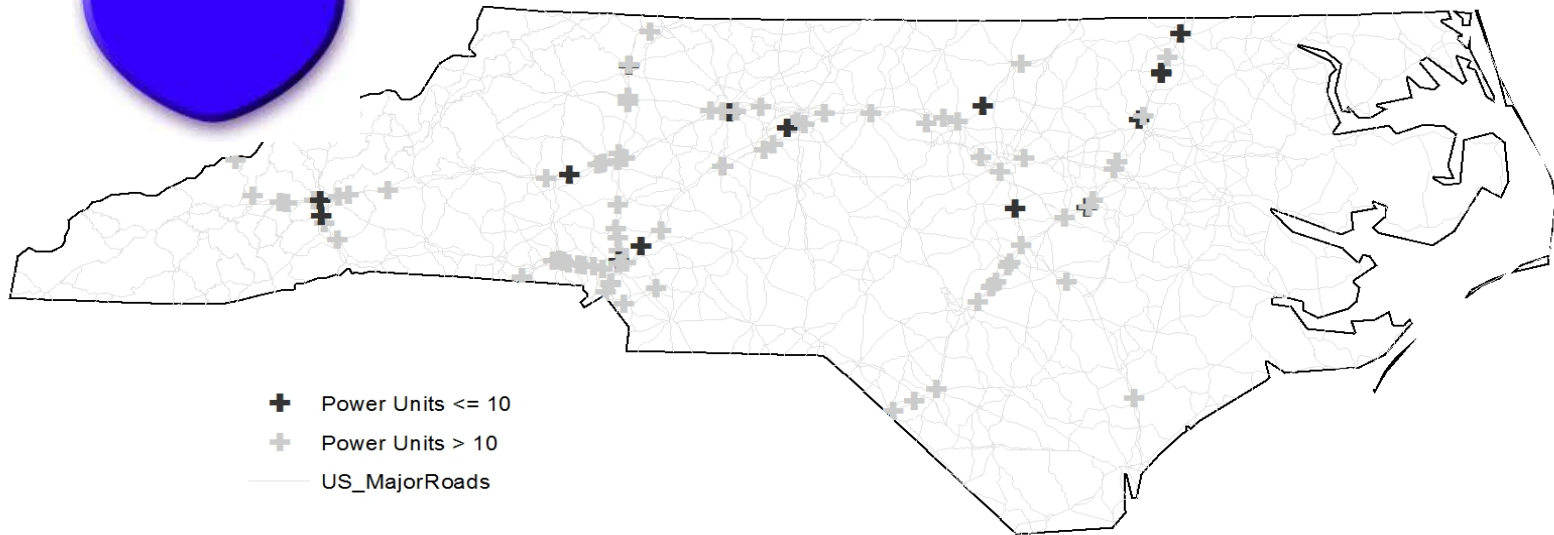
Carrier Attributes (from MCS-150) and Carrier Snapshot

- USDOT Number
- Carrier Size (# Power Units)
- Operation Classification (For Hire, Exempt, Private, etc.)
- Cargo Classification
- Domicile of Carrier

Entity Type: Carrier		
Operating Status: REGISTERED	Out of Service Date: None	
Legal Name: [REDACTED]		
DBA Name:		
Physical Address: [REDACTED]		
Phone: [REDACTED]		
Mailing Address: [REDACTED]		
USDOT Number: [REDACTED]	State Carrier ID Number:	
MC or MX Number: [REDACTED]	DUN & Number: [REDACTED]	
Power Units: 5,855	Drivers: 6,061	
MC & 150 Form Date: 09/17/2010	MC & 150 Mileage (Year): 378,994,979 (2009)	
Operation Classification:		
<input checked="" type="checkbox"/> Auth. For Hire	<input type="checkbox"/> Priv. Pass. (Non-business)	<input type="checkbox"/> State Govt
<input type="checkbox"/> Exempt For Hire	<input type="checkbox"/> Migrant	<input type="checkbox"/> Local Govt
<input type="checkbox"/> Private (Property)	<input type="checkbox"/> U.S. Mail	<input type="checkbox"/> Indian Nation
<input type="checkbox"/> Priv. Pass. (Business)	<input type="checkbox"/> Fed. Govt	
Carrier Operation:		
<input checked="" type="checkbox"/> Interstate	<input type="checkbox"/> Intrastate Only (HM)	<input type="checkbox"/> Intrastate Only (Non-HM)
Cargo Carried:		
<input checked="" type="checkbox"/> General Freight	<input checked="" type="checkbox"/> Liquids/Gases	<input checked="" type="checkbox"/> Chemicals
<input type="checkbox"/> Household Goods	<input checked="" type="checkbox"/> Intermodal Cont.	<input type="checkbox"/> Commoities Dry Bulk
<input type="checkbox"/> Metal sheets, coils, rolls	<input type="checkbox"/> Passengers	<input type="checkbox"/> Refrigerated Food
<input type="checkbox"/> Motor Vehicles	<input type="checkbox"/> Oilfield Equipment	<input checked="" type="checkbox"/> Beverages
<input type="checkbox"/> Drums/Tow away	<input type="checkbox"/> Livestock	<input checked="" type="checkbox"/> Paper Products
<input type="checkbox"/> Logs, Poles, Beams, Lumber	<input type="checkbox"/> Grain, Feed, Hay	<input type="checkbox"/> Utilities
<input checked="" type="checkbox"/> Building Materials	<input type="checkbox"/> Coal/Coke	<input checked="" type="checkbox"/> Agricultural/Farm Supplies
<input type="checkbox"/> Mobile Homes	<input type="checkbox"/> Meat	<input checked="" type="checkbox"/> Construction
<input checked="" type="checkbox"/> Machinery, Large Objects	<input type="checkbox"/> Garbage/Refuse	<input type="checkbox"/> Water/Well
<input type="checkbox"/> Fresh Produce	<input type="checkbox"/> US Mail	



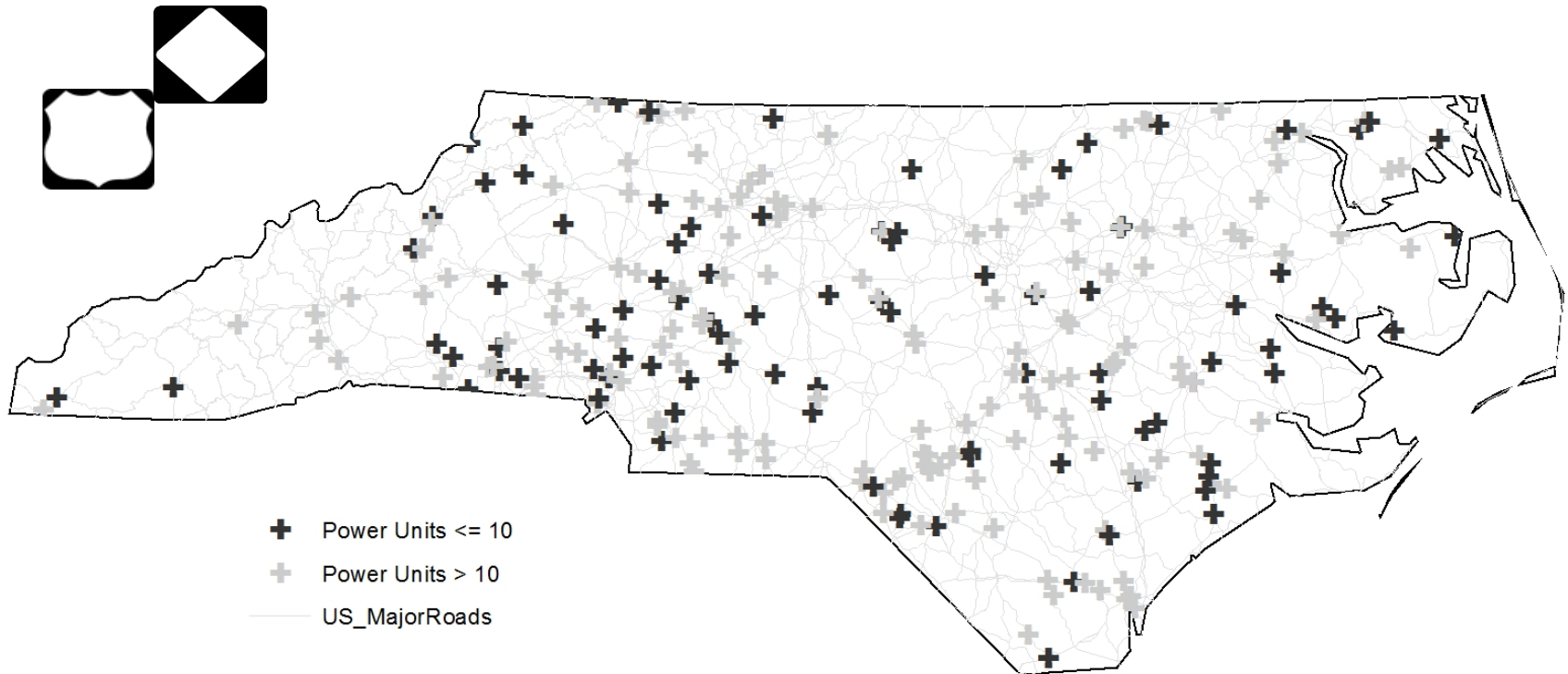
CUT Fatal Crashes on the Interstate by Carrier Size North Carolina 2005-2009



Interstate	Power Units <= 10		Power Units > 10		TOTAL	PERCENTAGE
	Total	Percentage	Total	Percentage		
I 26	1	5.6%	2	2.3%	3	2.9%
40	4	22.2%	24	27.9%	28	26.9%
I 74	0	0.0%	1	1.2%	1	1.0%
I 77	3	16.7%	12	15.1%	16	15.4%
85	5	27.8%	24	27.9%	29	27.9%
95	5	27.8%	19	22.1%	24	23.1%
I 485	0	0.0%	2	2.3%	2	1.9%
I 540	0	0.0%	1	1.2%	1	1.0%
TOTAL	18	100.0%	86	100.0%	104	100.0%



CUT Fatal Crashes on the Non-Interstate by Carrier Size North Carolina 2005-2009



CUT Fatal Crash by Non-Interstate Road Type and Power Units									
Power Units	ROAD TYPE								
	US		NC		SR		LCL		TOTAL
	TOTAL	PERCENTAGE	TOTAL	PERCENTAGE	TOTAL	PERCENTAGE	TOTAL	PERCENTAGE	
<= 10	49	52.1%	31	33.0%	8	8.5%	6	6.4%	94
> 10	81	48.5%	51	30.5%	16	9.6%	19	11.4%	167
TOTAL	130	49.8%	82	31.4%	24	9.2%	25	9.6%	261

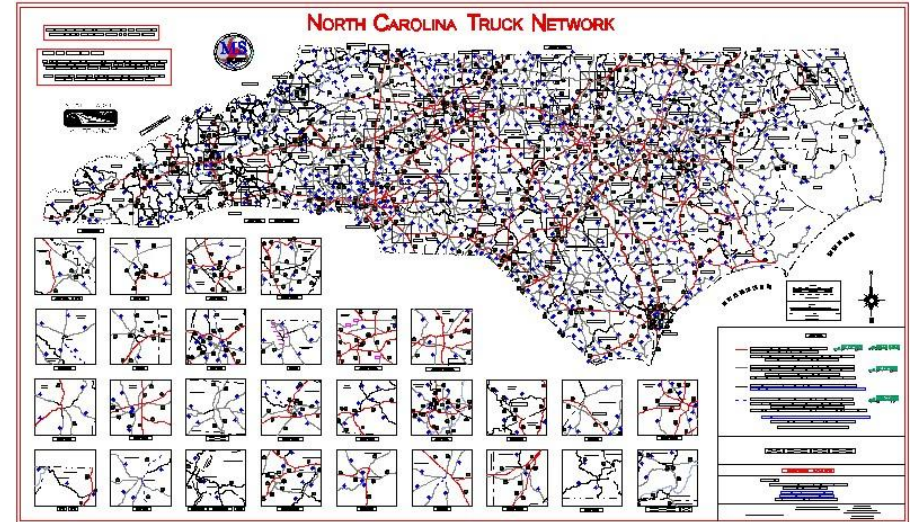


Bottom Line

- Off the Interstates
 - Fleet sizes smaller
 - More were domiciled in the state in which the crash occurred
 - More were private and exempt carriers
 - Proximity of crashes to reported business address suggest many operating environments are ‘local’
- On the Interstates
 - Fleet sizes tended to be larger
 - More likely to be a for-hire carriers located in other states

Considerations

- We recognize the continued industry pressure for '*more productive (heavier, longer combination vehicles (LCV) vehicles*)'
- Adequate STAA (network) routes (i.e., *access*) and *lack of connectivity* of routes make enforcement's job of route compliance difficult.
- Current fines for off-route operation are *insignificant* (< \$200).



ITRE

Institute for Transportation Research and Education
at North Carolina State University



VirginiaTech
**TRANSPORTATION
INSTITUTE**

R. M. Clarke Consulting

Considerations



- There is nothing to preclude *small* carriers from operating larger, heavier, more productive vehicles on non-interstate roads.
- ‘Small’ is not necessarily bad or unsafe.
- The small carrier often lacks the ‘*safety culture*’ of the larger, more established carrier.
- The population of ‘*small*’ carriers may be beyond the effective focus of many state trucking associations.



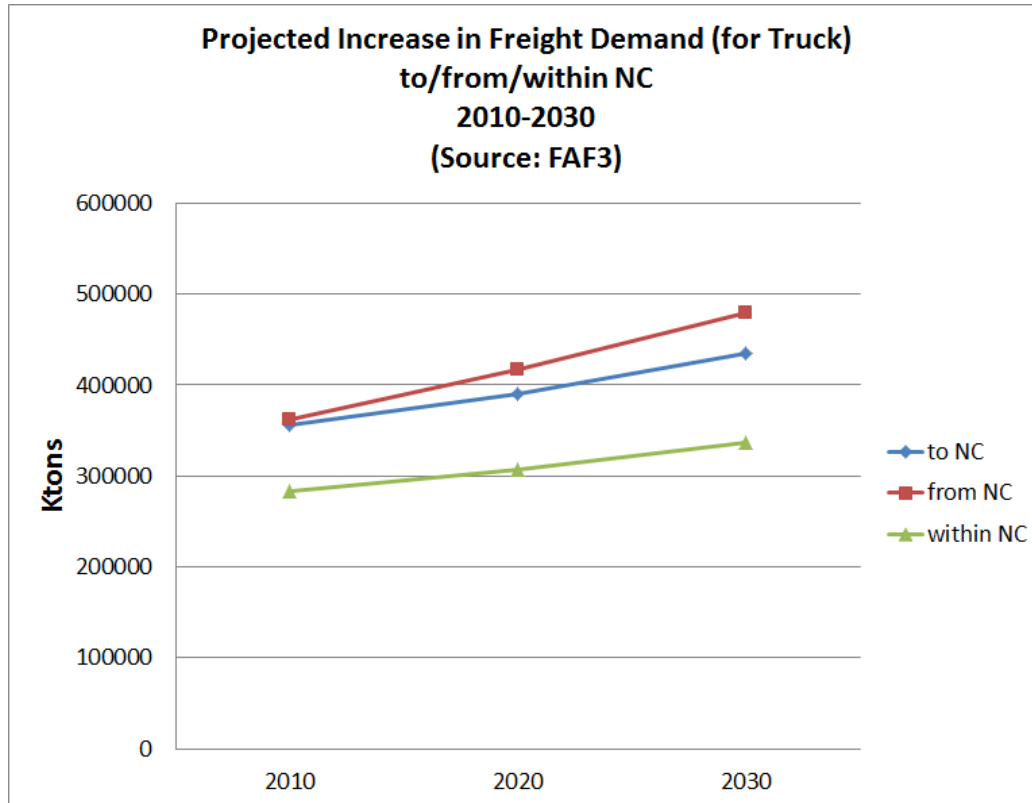
ITRE

Institute for Transportation Research and Education
at North Carolina State University



R. M. Clarke Consulting

Implications for Freight Planning



According to FAF3 estimates, close to 30% of the total tonnage to be moved by truck in NC will be defined by origins and destinations that are both 'within' the state

Much of this movement will likely take place on non-interstate roads where the data show that crashes involving combination unit trucks are more likely to involve fatalities.

Will the **non-interstate network in NC** be able to accommodate the estimated increase in truck-based freight movements in terms of an increase in the number of large trucks, types of trucks, as well as potential increases in truck size and weight?



Critical Points for Freight and Logistics Planning

- Infrastructure planning for roads and bridges **MUST** consider the needs of large commercial vehicles
- The safe and efficient movement of freight depends upon the entire network, not only the interstate portion.
- Less than total network planning will result in costly delays in delivery times and increases in the transportation cost of goods.
- Failure to accommodate the operating needs of large commercial vehicles, especially off the interstate, poses a serious highway safety problem



Are there 'research' issues that need to be addressed?

- More specific characterization of the 'rural' (non-interstate) roadway environment.
- The crash involvement of single unit trucks (SUTs) in interstate and intrastate operations
- Estimates of freight demand and current (truck) network capacity
- Demonstrated methods to improve the safety of the 'small' carrier: The New Entrant Program and 'Beyond'
- Differentiating the safety practices of those who 'operate trucks as part of the business' and those who 'are in the trucking business'



Are there 'research' issues that need to be addressed? - con't

- Interim (spot) 'improvements' required to increase network access and connectivity
- More accurate and reliable data on truck miles traveled (by class of vehicle and class of roadway)
- An evaluation of CMV enforcement practices on 'rural' roadways: Current practices and future alternatives
- CMV-involved crashes as a function of different 'rural' roadway geometries and methods of traffic control
- The integration of freight and land use planning : Applications to the Charlotte freight mobility planning process



The 'Bottom Line'

We need to integrate our traditional concerns for '*truck safety*' with the need to simultaneously increase the *productivity of 'the truck'* as a primary means for the surface transport of freight within the larger economy.

The '*truck*' will remain a critical component of the intermodal transport of freight within the global supply chain.

Focusing on truck safety alone is a necessary, but not sufficient, condition for maximizing the safe and efficient movement of freight by truck.

Productivity, without safety, is *unacceptable*

