



NORTH CAROLINA

Department of Transportation



The Supply Chain for Economic Development

Dana Magliola
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NCDOT Supply Chain SME
November 16, 2021

THANK YOU!



Introduction

Dana Magliola

- Program Manager, Freight & Logistics, NCDOT Rail Division
- NCDOT Supply Chain SME
- Maritime, freight forwarding, applied research background
- *Connecting transportation strategy, planning and investment to commerce and industry*



If you have questions, please feel free to jump in.

Objectives

- To strengthen the supply chain, freight, and logistics expertise and capabilities of the business development and industry recruiting professionals in the North Carolina Economic Development Association
- To introduce key supply chain concepts, current issues, best practices, trends and future developments in the sector

Agenda

- Holy Supply Chain, Batman!
- Beyond Manufacturing: Agriculture, Energy, Finance
- North Carolina, Supply Chain Powerhouse:
Organizations + Resources for Supply Chain Development
- eCommerce Revolution & Change Agents in the Supply Chain
- Buzzwords, Part 2: Maritime Edition



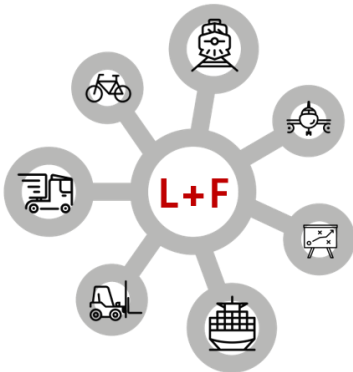
Holy Supply Chain, Batman!

Holy Supply Chain, Batman!

- Supply and Demand Mayhem:
Rate volatility and record profits
- Truck driver shortage, COVID issues
- Intermodal boom!
- California congestion & confusion
plus retail stockouts and panic...
just in time for the holidays

- The supply chain is so hot right now.





Beyond Manufacturing: Agriculture, Energy, Finance

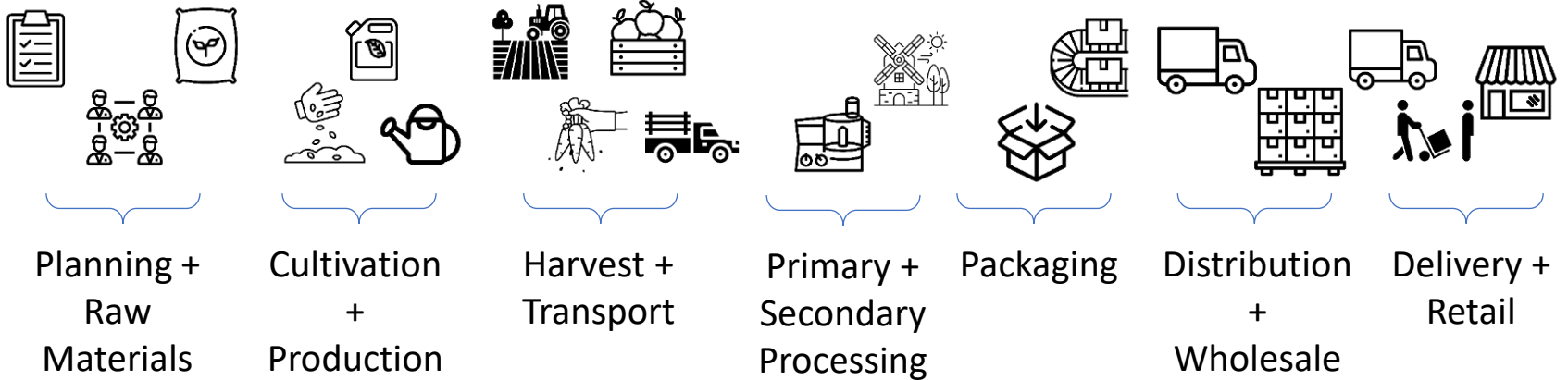
Agriculture

Defining the agricultural supply chain:

- Think manufacturing, but with food
- Value-add (value-chain)
- Every scale of agriculture has a supply chain
- Every kind of agriculture has a supply chain (traditional, livestock, organic)
- Support ecosystem (machinery, transportation, paper, finance, real estate)
- Foundational to economic development; value added agriculture as industrial development



Agriculture



Agriculture: think manufacturing, but with food

Agriculture

Major issues facing the agricultural supply chain:

- IP / seed provenance
- Demand fluctuation (COVID)
- Shifting global consumption + consumer trends
- GMO/organic
- Climate change crisis
- Food security + waste
- Consolidation + scale economics
- Political uncertainty



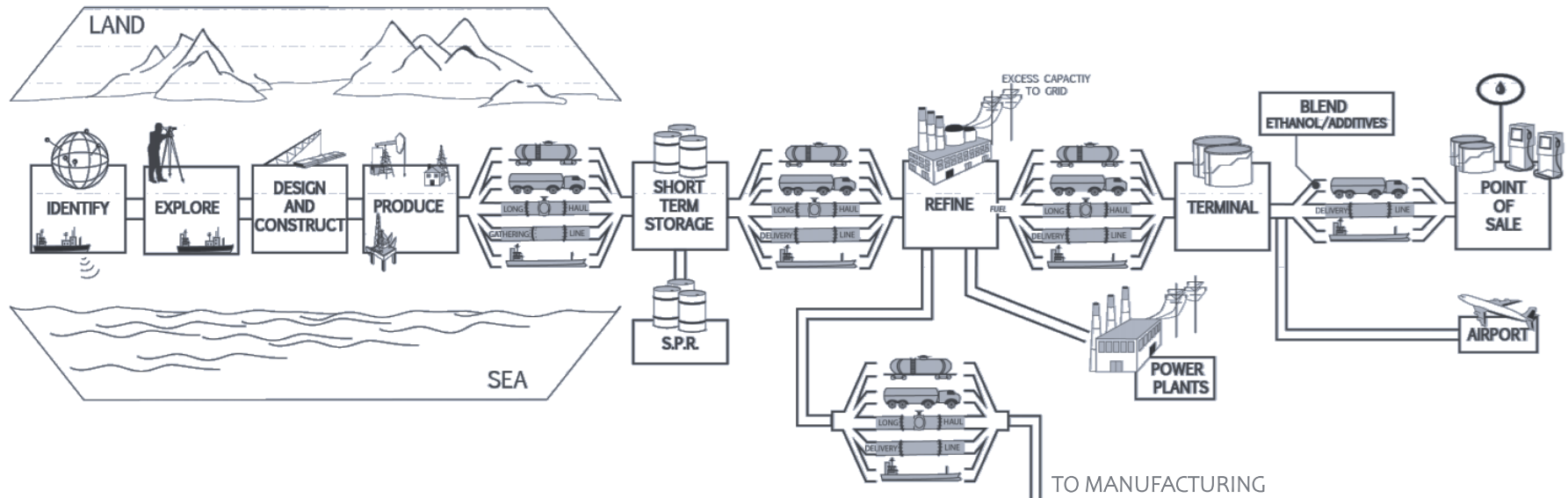
Agriculture

Innovation in the agricultural supply chain:

- Smart farming
- Application of technologies
- Digital
- UAS / drones
- Big data analytics
- Automation



Energy



Energy supply chain is a collection of other supply chains:

- Exploration + extraction industry
- Storage + transportation
- Refineries + processing plants
- Distribution + transportation

Energy

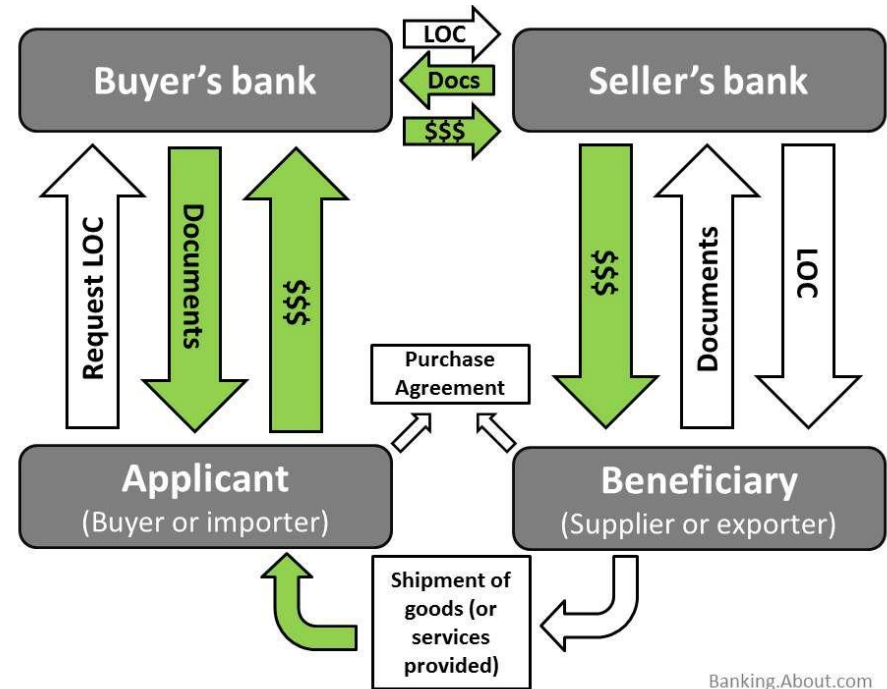
Major issues in energy supply chain:

- Shift in consumption
- Renewable / green power
 - BLADES/SMART Power, more
 - Popular + political demand
 - Environmental concerns
 - Climate change crisis
- Large scale network disruption
- Reliance on contracted labor
- Cybersecurity



Finance

- Banks heavily involved in global trade (letters of credit); risk mitigation
- Blockchain's origins in fintech applied to supply chain
- Commodity risk management (hedging)

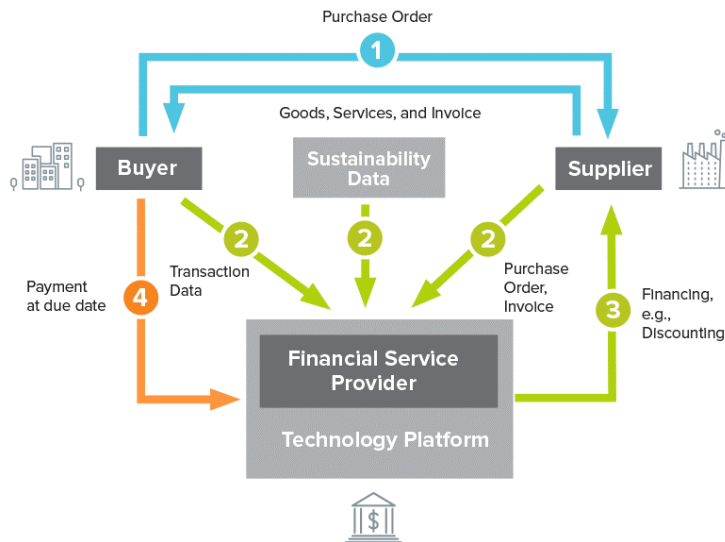


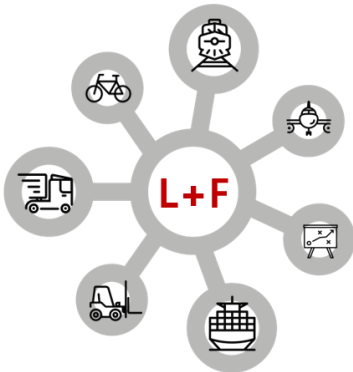
Caterpillar factory, Sanford, NC

Finance

Supply chain finance:

- Leverages buyer's short-term credit; lengthens payment terms; offers the option for sellers to collect earlier
- Improve cash flow, liquidity (working capital!)
- Some use payment terms as incentive
- Sustainability now a factor in supply chain finance (contract management, supplier management; quality, risk mitigation)





North Carolina, Supply Chain Powerhouse:
*Organizations + Resources for Supply Chain
Development*

Resources - Academic

Academic

- UNC-Wilmington
- NC State University
- Appalachian State
- North Carolina A&T
- East Carolina
- UNC-Charlotte
- UNC-Pembroke
- NC Wesleyan
- Wake Tech
- Central Piedmont
- *And more...*

NC STATE Poole College of Management
Supply Chain Resource Cooperative



Resources – Professional Organizations

Professional Organizations

- APICS + Supply Chain Council = Assoc. for Supply Chain Management
- CSCMP: Council for Supply Chain Management Professionals
- ISM: Institute for Supply Management
- MHI: Material Handling Institute



Resources – Workforce Development

Workforce Development

- NC MEP / NC State IES
- NC Works
- North Carolina
Manufacturing Institute
- Mechatronics
- Robotics

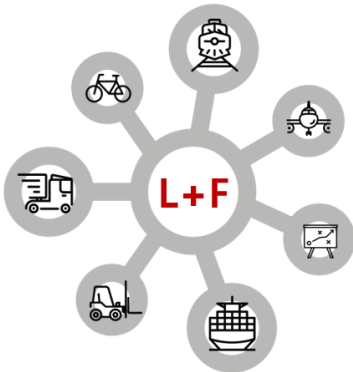


Resources - Publications

Publications

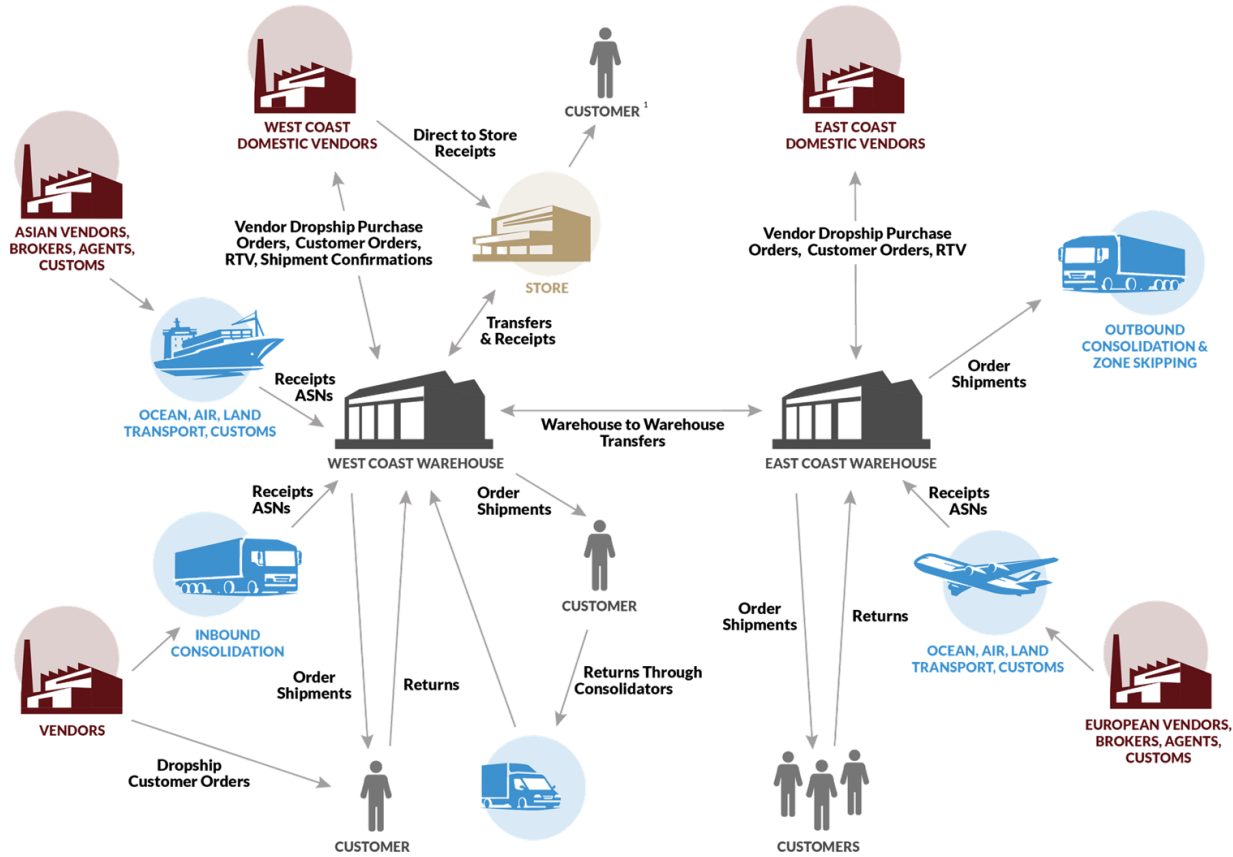
- MH+L
- Logistics Management
- Modern Materials Handling
- Supply + Demand Chain Executive
- Supply Chain Brain
- SCM Review
- JOC
- Gartner
- AJOT
- Freightwaves
- Transport Topics

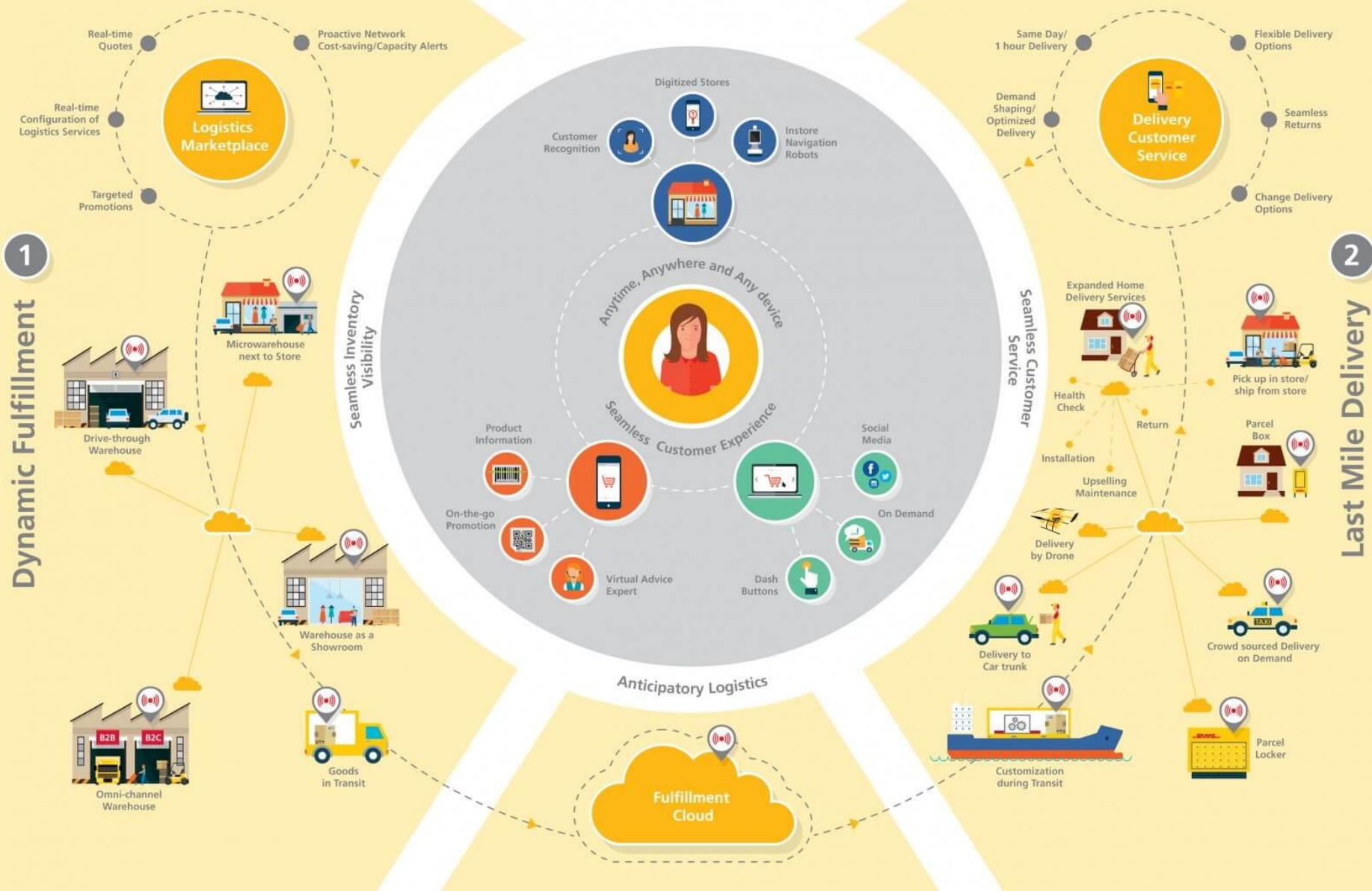




eCommerce Revolution & Change Agents in the Supply Chain

Supply Chain Context

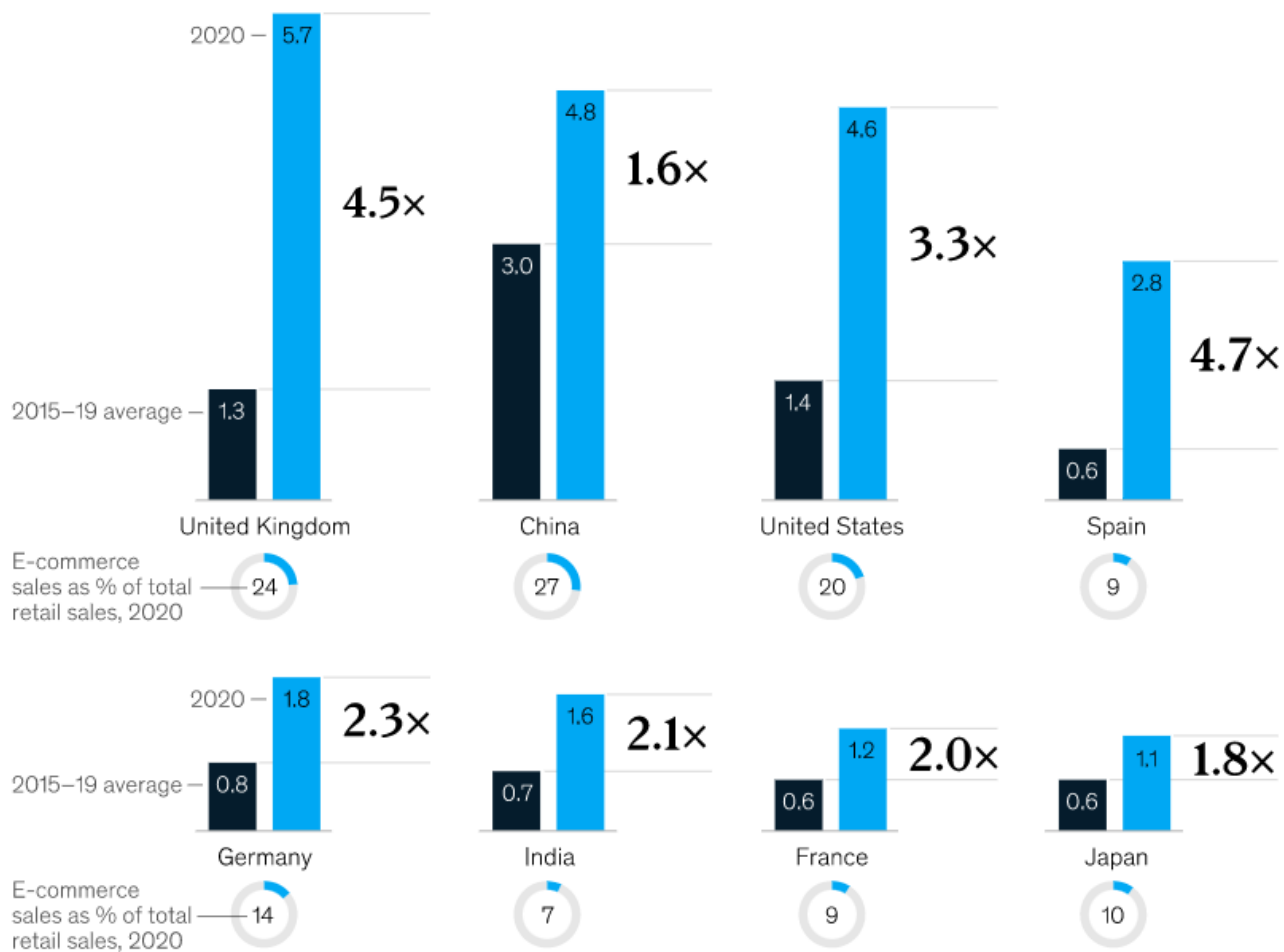




The future (now) is omnichannel.

Growth in eCommerce

Year-over-year growth of e-commerce as share of total retail sales, percentage points



Source: Retailing by Euromonitor International, 2021; McKinsey Global Institute analysis

Change Agents: Technology + Innovation

- Since 2012 more than 40 states (and D.C.) have introduced, or enacted legislation related to ACVs
- Executive orders also drive some states' policy



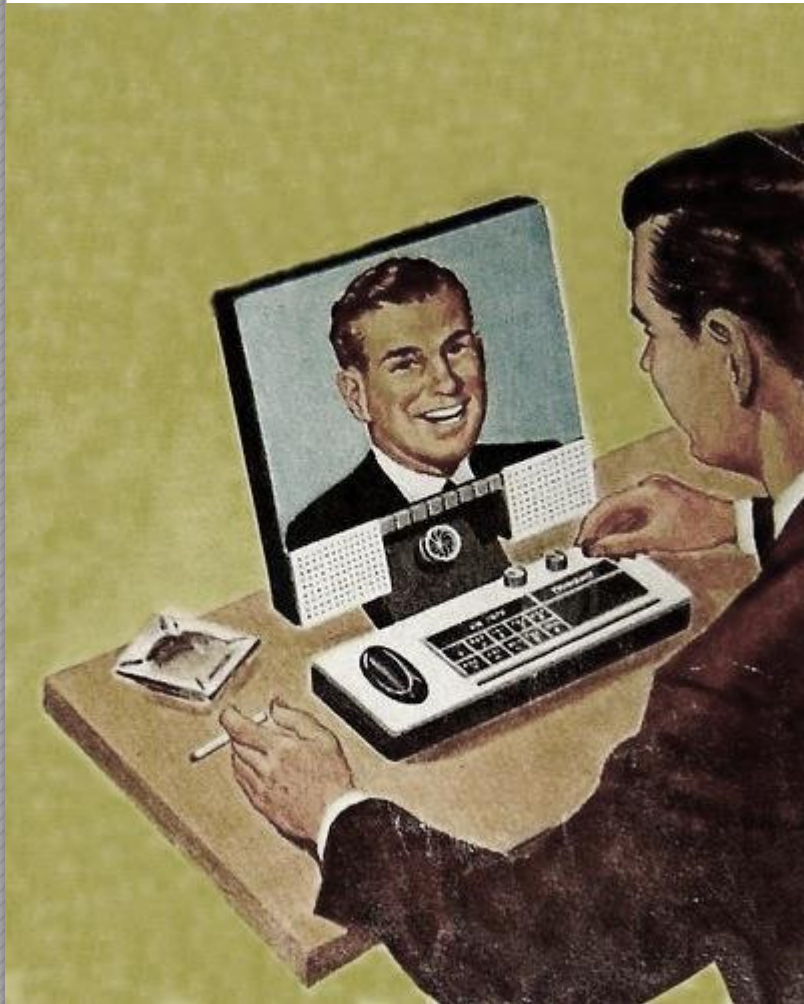
Change Agents: Technology + Climate Change

- Electrification + battery technology improvements
- *Green* energy: wind-power, on shore and off-shore
- Policy driven: EO80, 218
- Market driven: \$\$\$



Das Neue Universum 83, Klaus Burgle (1966)

Change Agents: Shifting Market Dynamics



- Working pattern changes accelerated by COVID
- Workforce challenges in manufacturing, trucking/transportation
- Increasing supply chain visibility through IOT, blockchain
- Manufacturing 4.0 + automation
- Supply chain, IP cybersecurity concerns



Buzzwords, Part 2: Maritime Edition

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- Bill of Lading
- Waybill
- Consignee
- Beneficial Cargo Owner (BCO)
- Ocean Carriers
- Integrators (FedEx, UPS)
- Freight Forwarder
- Customs Broker
- Incoterms
- Cross Docking + Transloading
- Bonded Warehouse



Buzzwords, Part 2: Maritime Edition

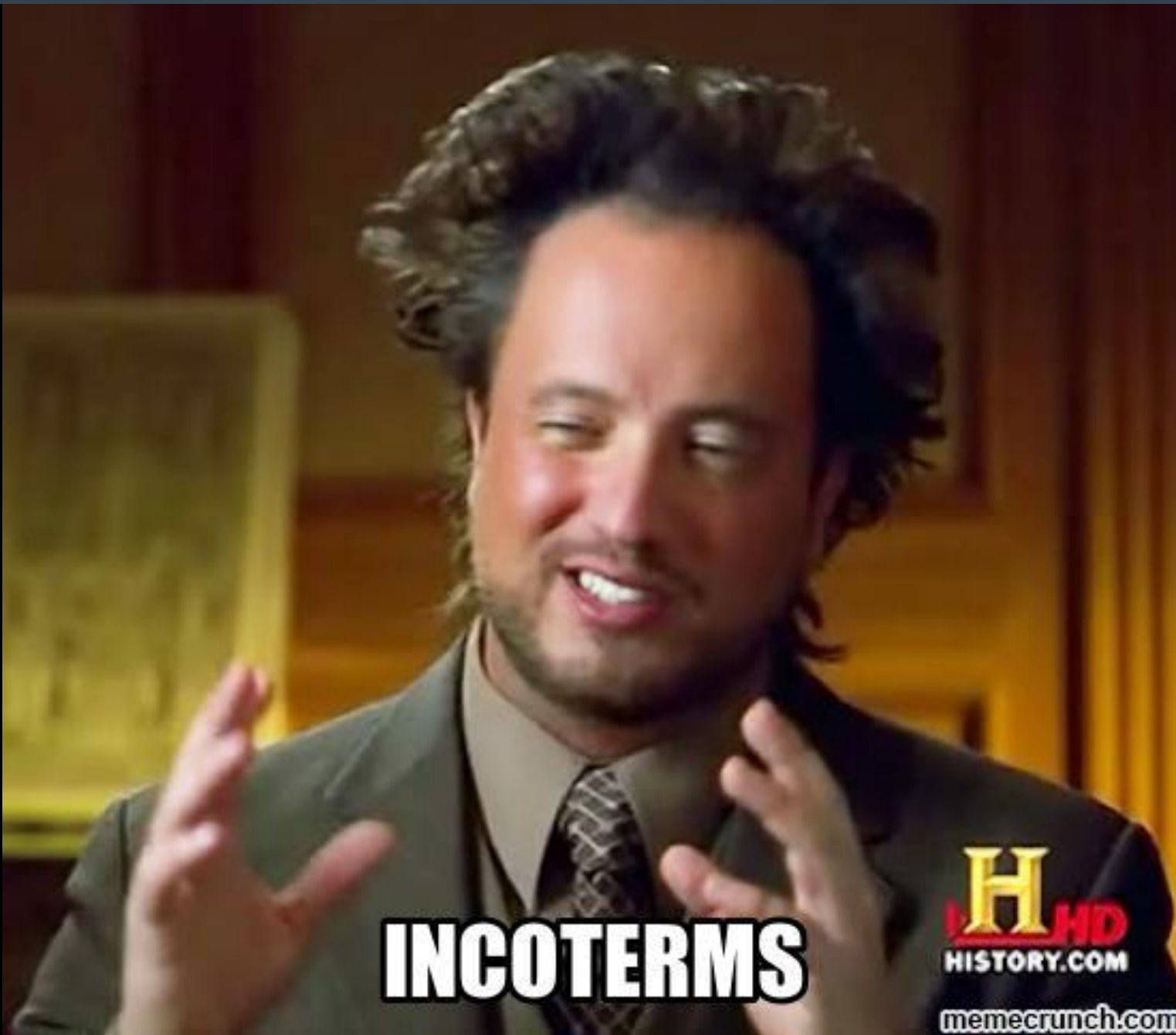
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- NVOCC
- Customs Broker

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Shipper's Name and Address Sender: International Operations Center Bentleybourne 4th Fl 100 Bentleys Road Bentley NSW 2161 Tel: +61 2 9330 1000		Shipper's Account Number		Not Negotiable Air Waybill Issued by: ETHIAD AIRWAYS NEW AIRPORT ROAD ABU DHABI, 35566, UNITED ARAB EMIRATES		
Consignee's Name and Address INTERNATIONAL CARGO EXPRESS PTY LIMITED c/o Air Menzies International Qantas Drive Bensham QLD 4009 AU TE: +61 736081777		Consignee's Account Number		Copies 1, 2 and 3 of this Air Waybill are originals and have the same validity. It is agreed that the goods described herein are accepted in apparent good order and condition (except as noted) for carriage SUBJECT TO THE CONDITIONS OF CONTRACT ON THE REVERSE HEREOF. ALL GOODS MUST BE CARRIED BY AIR OTHER MEANS INCLUDING ROAD OR RAIL THROUGH INTERMEDIATE STOPPING PLACES WHICH THE CARRIER DEEMES APPROPRIATE. THE SHIPPER'S ATTENTION IS DRAWN TO THE NOTICE CONCERNING CARRIER'S LIMITATION OF LIABILITY. Shipper may increase such limitation of liability by declaring a higher value for carriage and paying a supplemental charge if required.		
Issuing Office's Agent's Name and City D-68229 MANNHEIM / GERMANY		Account No.		Accounting Information ++ SBY ++		
Agent's IATA Code 23-47		Account No.		Reference Number		
Airport of Departure (Addr. of First Carrier) and Requested Routing FRANKFURT AM MAIN		Optional Stopping Information		Declared Value for Carriage		
To: By First Carrier AUH EY BNE EY		By: Currency EUR PPI X		Declared Value for Customs NVD NCV		
Origin of Goods BRISBANE		Requested Routing EY002/08 EY484/09		XXX		
Handling Information		MRH 180E3201		SC1 X		
No. of Pieces	Gross Weight	Rate Class	Chargeable Weight	Rate	Total	Nature and Quantity of Goods (Net Dimensions in Volume)
1	460.0K	Q	460.0	2.75	1265.00	Consolidation as per attached list DIMS 315x135x26 CM x 1 VOL 1.11 M3
1	460.0				1265.00	
Paid		Value of Goods		Other Charges		
1265.00		1265.00				
Total Other Charges Due Agent		Total Other Charges Due Carrier		Total Freight		Shipper certifies that the particulars on the face hereof are correct and that insofar as any part of the consignment consists of dangerous goods, such part is properly described by name and is in proper condition for carriage by air according to the applicable International Dangerous Goods Regulations. AS AGENT OF THE SHIPPER Signature of Shipper or its Agent
Total Collected		Total Charges in Desc. Currency		06-Sep-19		
1265.00		AS AGENT OF THE CARRIER: ETHIAD AIRWAYS MANNHEIM		Signature of Issuing Office or its Agent ANNETTE UTTER		
Fair Carrier's use only at destination		Charges at Destination		Total Collect Charges		

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Buzzwords, Part 2: Maritime Edition

- Bonded warehouse
- Cross-docking
- Transload



Know Your Mode Redux: Maritime

Kinds of Maritime Shipping

- Containerized
- Bulk, break-bulk
- Tanker
- Barge (bulk, container)
- RoRo
- Out-of-gauge; project cargo



Maritime

Port of Wilmington

- Container, bulk, breakbulk services
- 6 Post-Panamax cranes
- On-dock rail connecting to CSX network
- 5,000+ container gate moves per week
- 320,000+ TEU annual throughput
- 4 million+ tons of general cargo annually
- 1,000 ship calls per year
- Highest productivity on US East Coast
- FY20 container volume up 4% over FY19
- FY20 refrigerated container record:
25,600 TEU, up 13% YOY



The Port of Wilmington on the Cape Fear River

Maritime

Port of Morehead City

- Bulk, breakbulk services
- 1M sq. ft. of covered storage
- Rail access to Norfolk Southern network
- RoRo access on terminal
- Heavy-duty gantry crane
- Rail + conveyor to shiploader for bulk
- 9 berths, over 5,300 ft. wharf frontage
- \$3.8B worth of goods move through annually



The Port of Morehead City

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bit.ly/NCDOTsupplychain

NCDOT Connect Resources:
bit.ly/FreightConnectNC

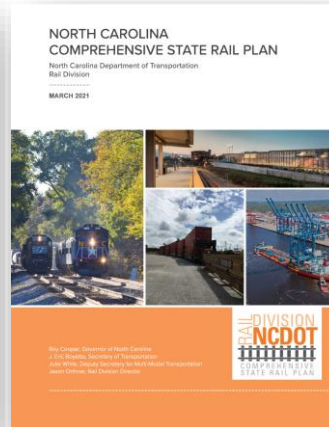
Resources



NC Ports Strategic Plan 2021



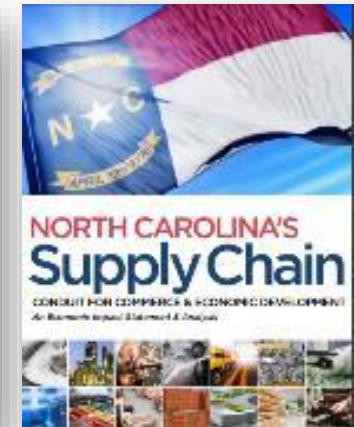
NC Ports Economic Impact Study 2018



NCDOT State Rail Plan Expected 2021



NCDOT State of Aviation 2021



NC Supply Chain Economic Impact Study 2016