

The Case for a Pan-American Manufacturing Ecosystem

Today's event presented by Resilinc





Bindiya Vakil
CEO & Co-founder
Resilinc



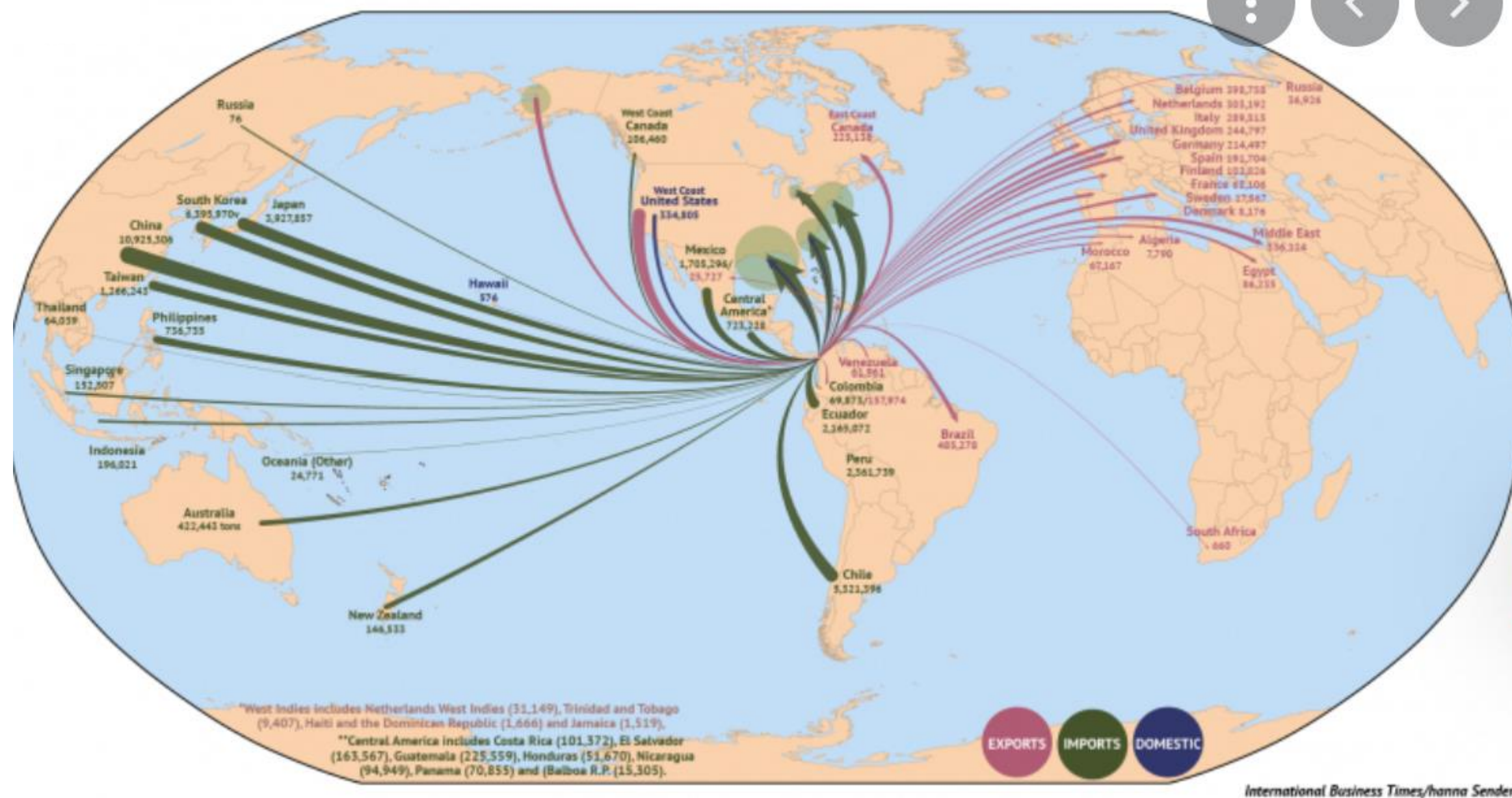
Tom Linton
Senior advisor at
McKinsey, ex-CSCO Flex



Prof. Dale Rogers
Supply Chain Department
Arizona State University

OUR PANEL

U.S. TRADE ROUTED THROUGH THE PANAMA CANAL



- Single points of failure
- Long transit times
- Carbon footprint of ocean

GLOBAL SHIPPING ROUTES



- Transit times of weeks
- Long port delays
- Cash tied up in inventory

The supply chain imperative

Resilience

Sustainability

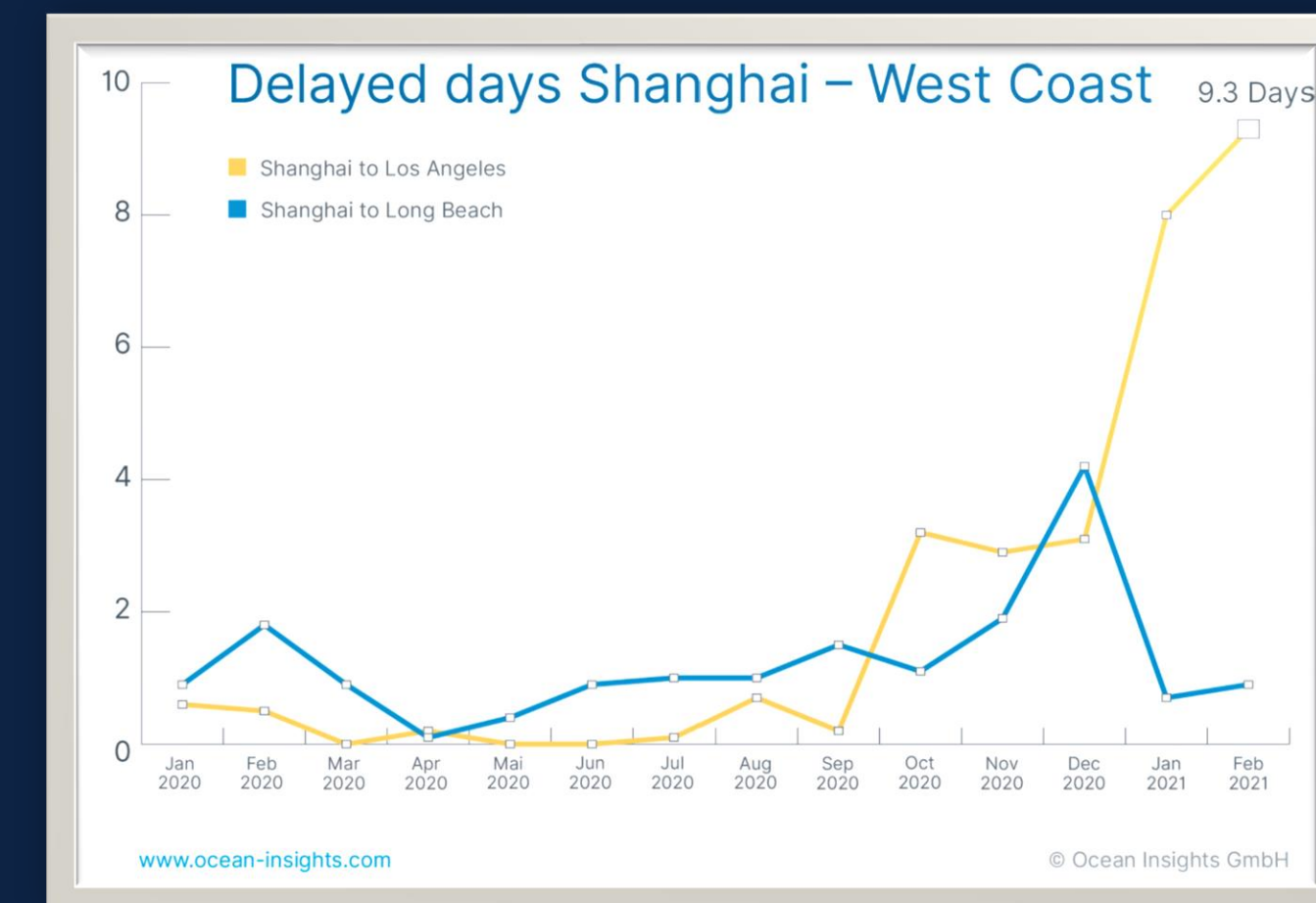
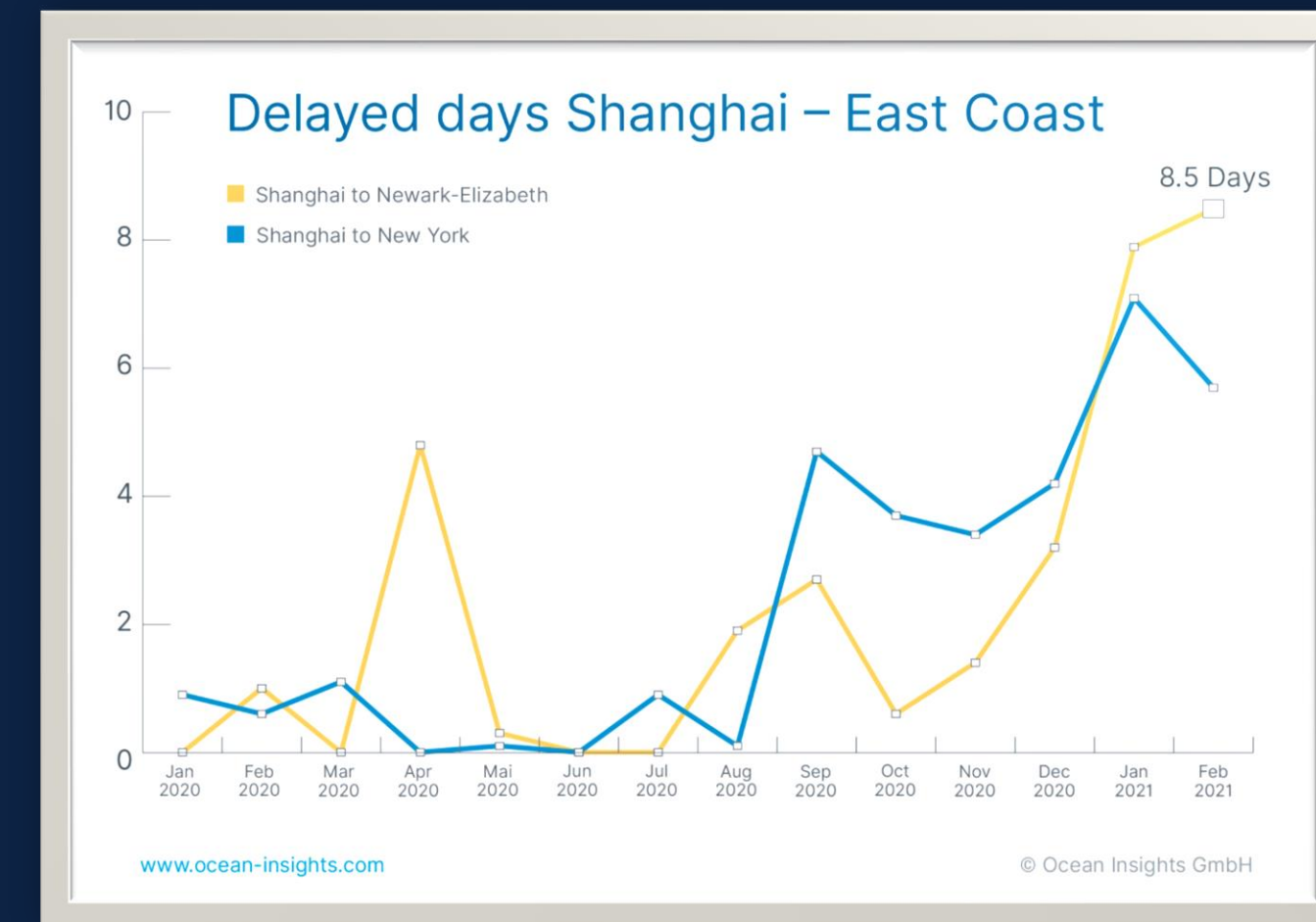
Flexibility and Agility

Cost savings

Labor availability

Climate Readiness (water)

Cash and Inventory reduction



The Pan-American Land Transportation Network

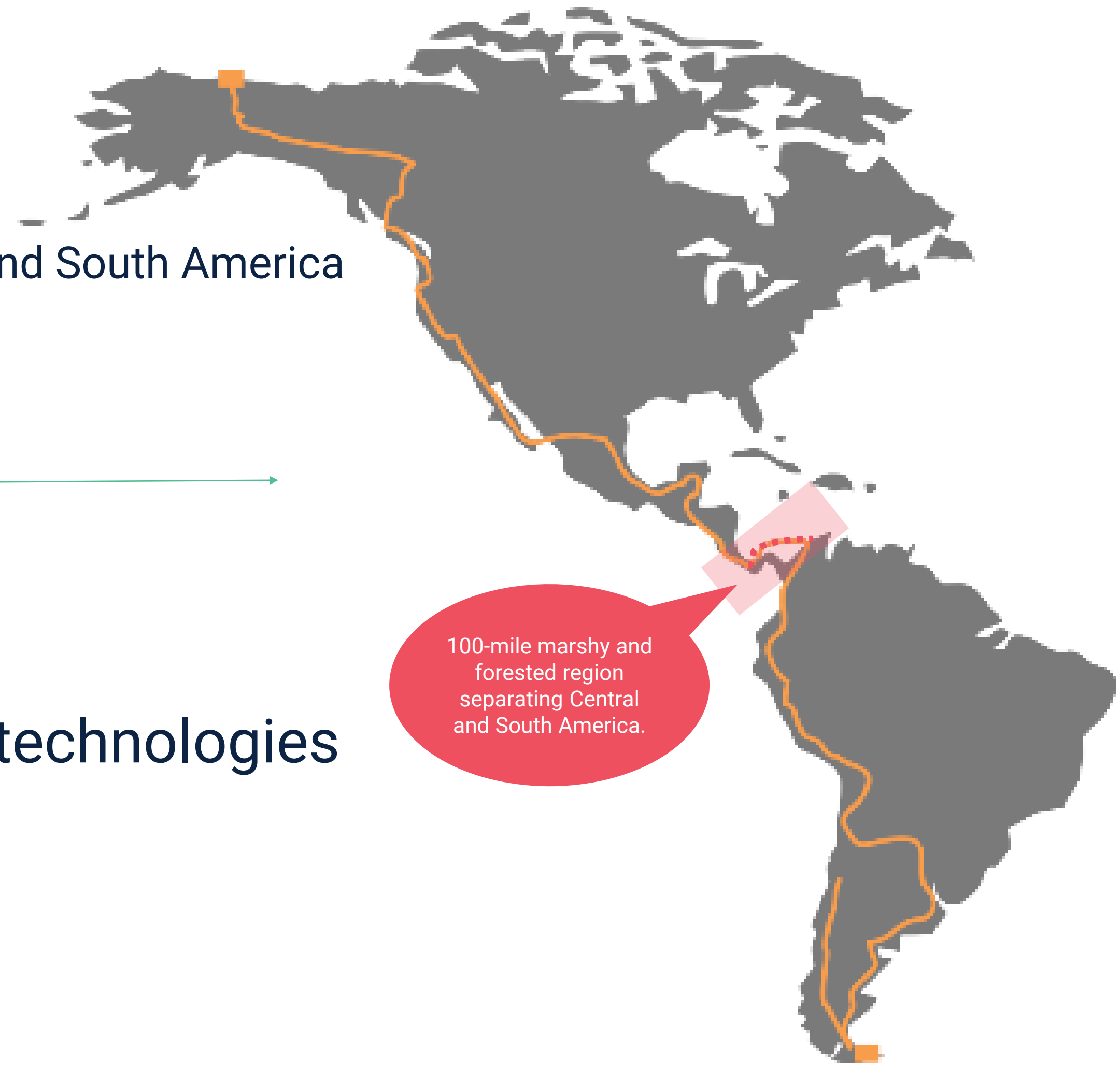
- Starts in Prudhoe Bay, Alaska
- Ends in Ushuaia (Tierra de Fuego), Argentina
- 19,000-mile network of roads throughout North, Central and South America
- Only major break is the Darién Gap

- **Near term:**

- Expand and upgrade current roads
- Bridge Darién Gap → latest tunnelling technologies

- **Medium to long term:**

- Modern rail transportation network



1

Modernizing the North and Central American Highway



Source: Wikipedia

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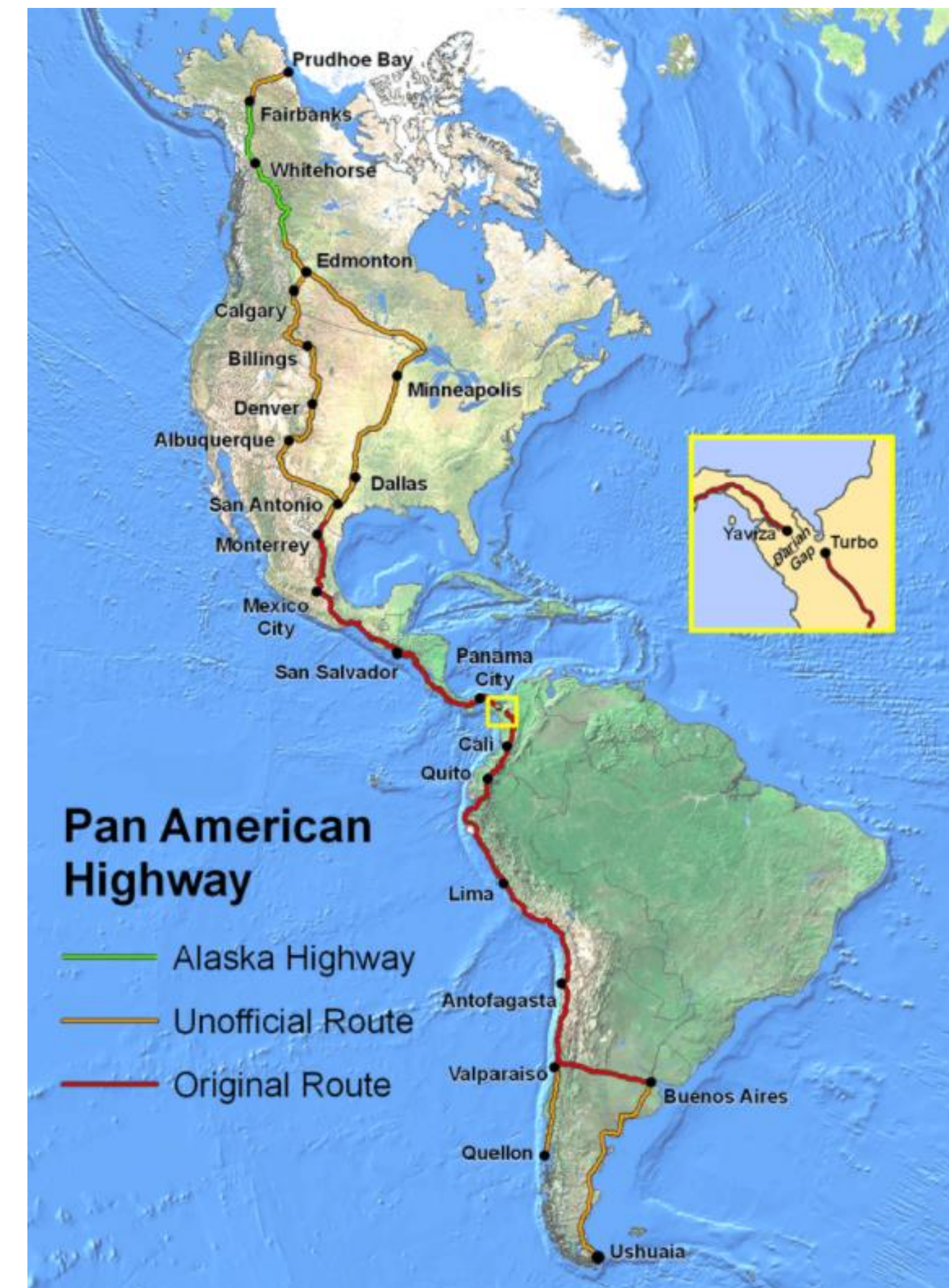
2

Bridging the Darien Gap



3

Connecting the Continents



Source: Brilliant Maps.com

The supply chain imperative

Resilience
Sustainability
Flexibility and Agility
Cost savings
Labor availability
Climate Readiness (water)
Cash and Inventory reduction

The strategic imperative

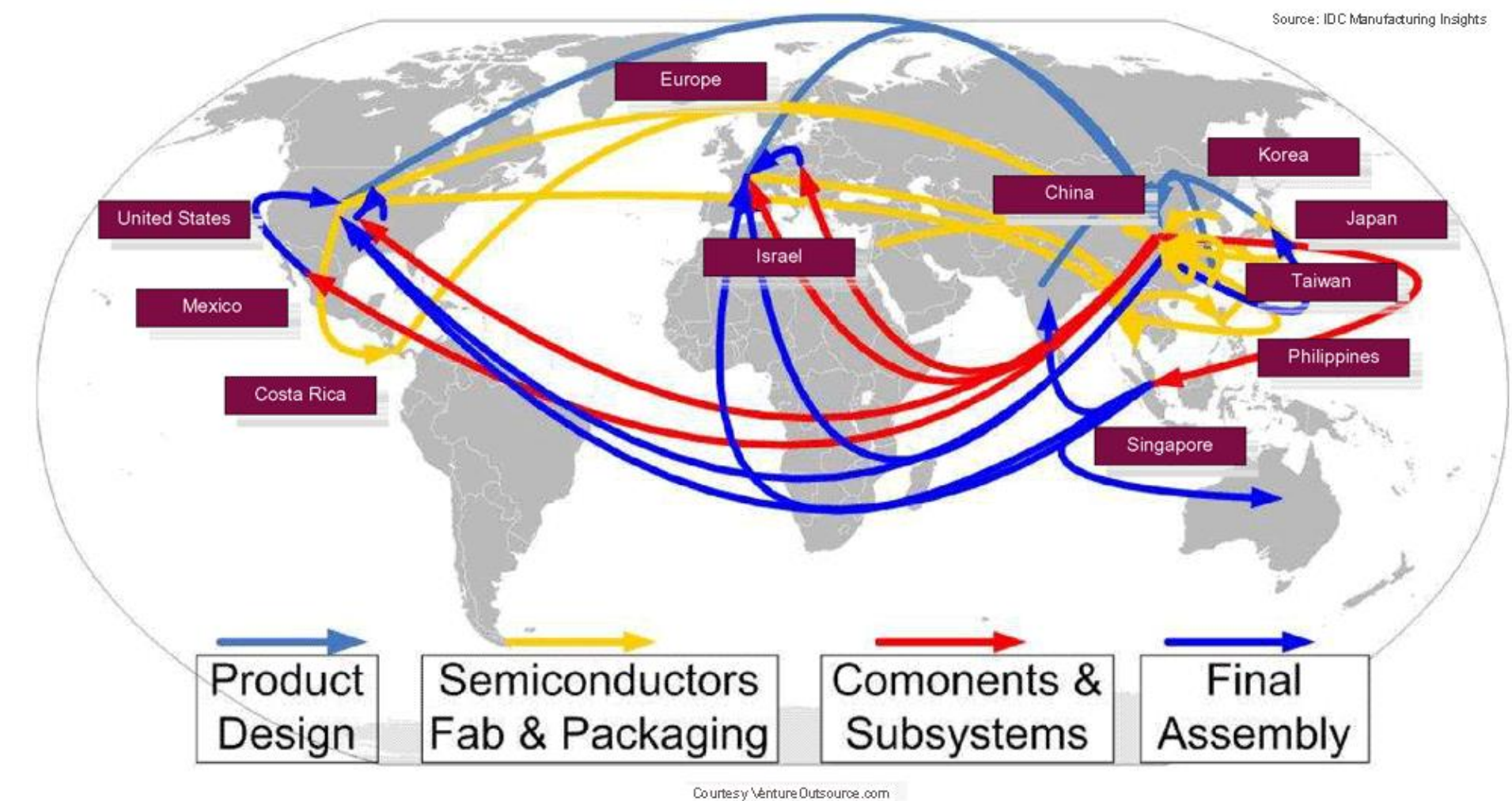
National security
Immigration
Geopolitical value
Reduced dependence on China
Improved relations with neighbors
Alignment of interests
Counter narcotics trade

Reshoring Semiconductor Manufacturing

Added complexity

Added back-and-forth

Added air transportation costs



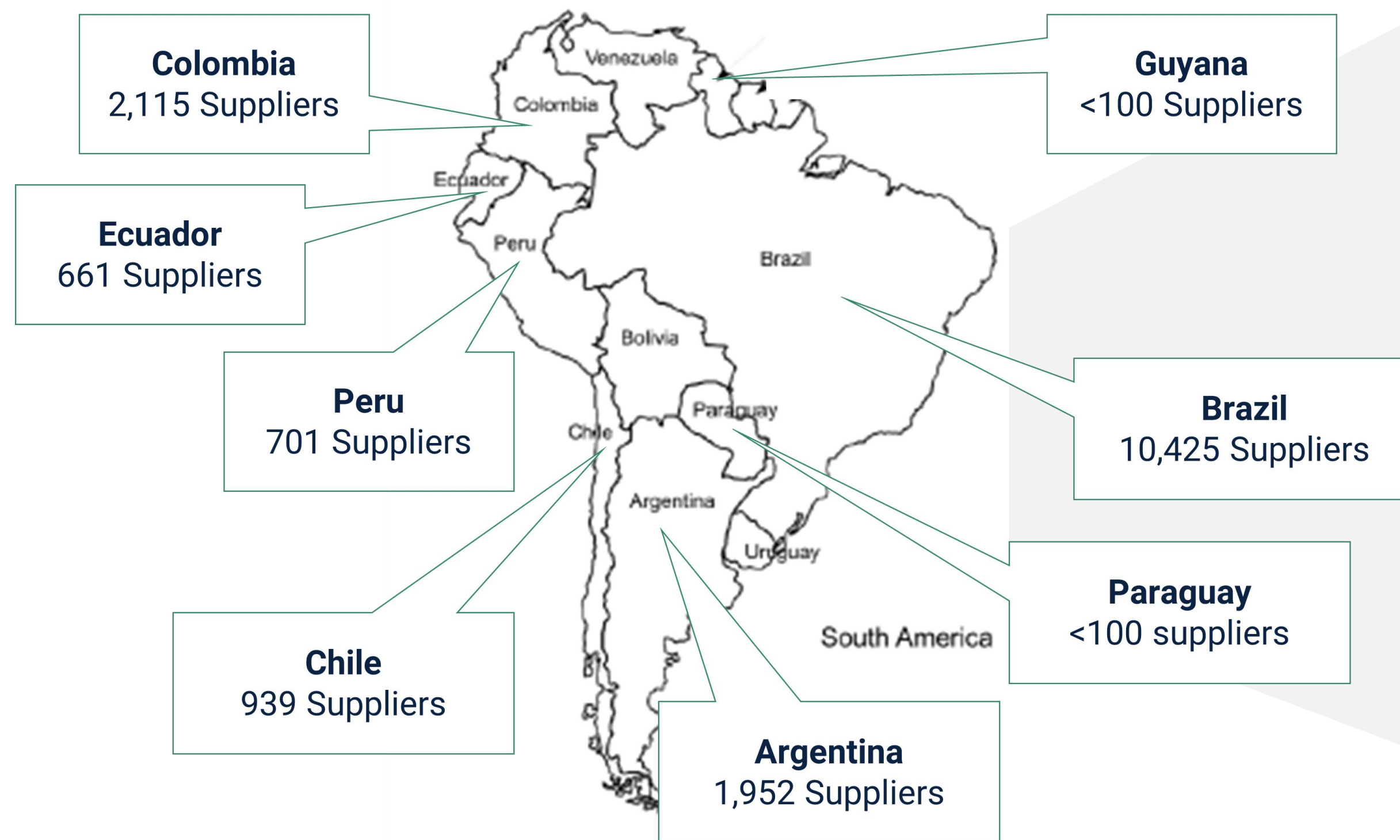
Source: IDC Manufacturing Insights and VentureOutsource.com

Near-shore entire ecosystem supporting North American consumers

A thriving ecosystem of suppliers critical to key industries

Auto, steel, chemicals, electronics, pharmaceuticals, apparel and footwear, and appliances

>17,000 suppliers with sites in South America



Top part & product categories mapped to S. America

Lithium, copper, iron, silver, zinc, tin, lead, manganese, bauxite

Drugs & Pharmaceuticals Manufacturing

Acids, Organic: Hydroxyacetic, Oleic, Stearic

Mineral Oil, Petrolatum

Chemical Raw Materials and intermediates

Various Compounds

Sheeting, Plastics (Reinforced)

Fastening, Packaging, Strapping, Equipment

Computers, Batteries And Electronics Hardware

Electronic Components, Replacement Parts, And Accessories

Adapters, Clips, Connectors

Spectrophotometers, Atomic Absorption

Power Supplies, Surge Protectors, Uninterruptible Power Supp

Switching, Networking, electronic equipment

Direct Access Storage Devices & Controllers

Amplifiers And Preamplifiers (Not For Sound Systems Or Tv An

Memory, Processors

Transformers, Circuit Breakers, Power & thermal parts, coil, chokes

Passives: Caps, Resistors

Cables, Computer, Pre-made: Printer, Terminal, Disk

Apparel, Footwear, Sub-contractors

Stoppers, Rubber And Synthetic products

Short Wheelbase, Automotive assembly

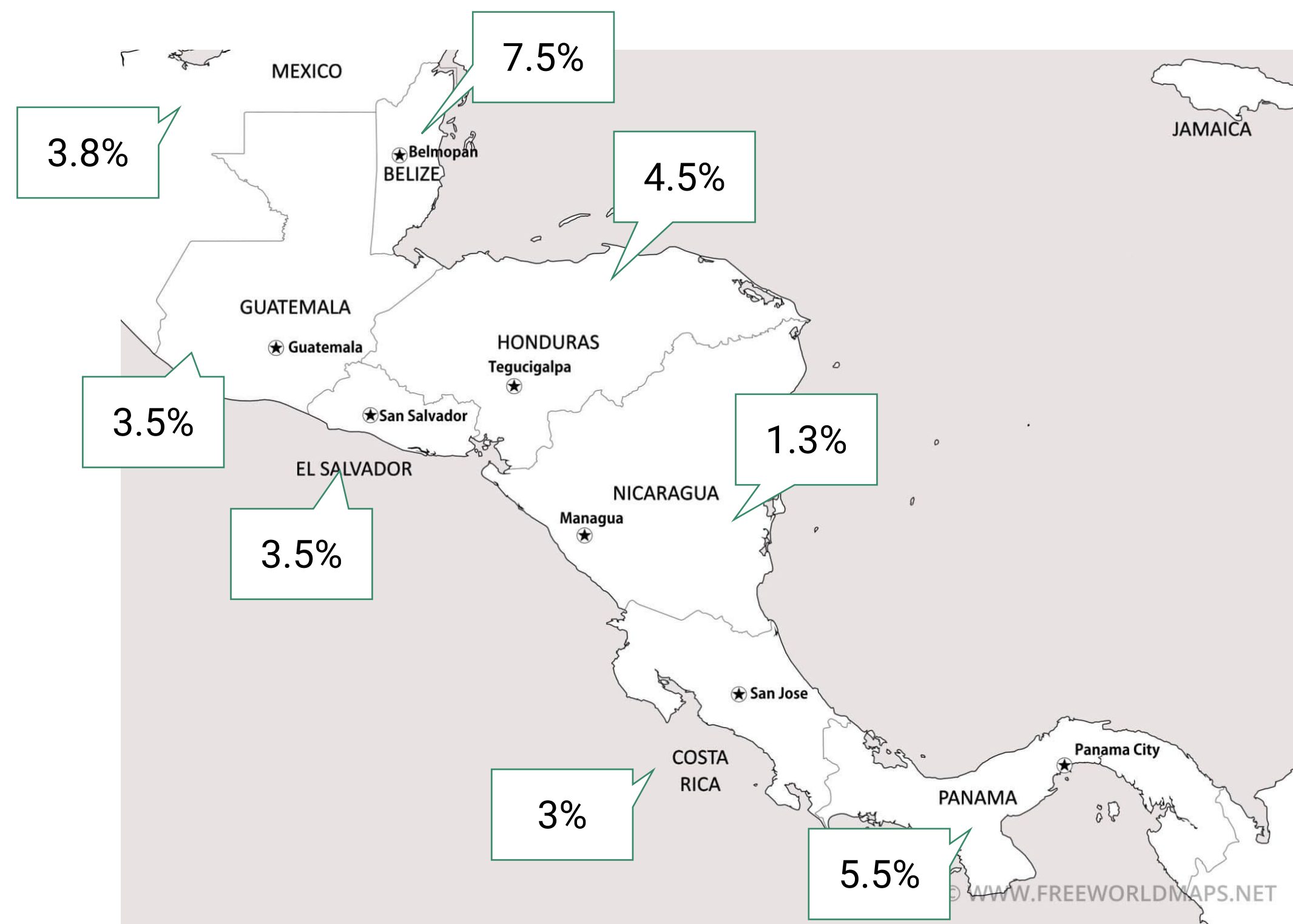
Tires And Tubes, Industrial products

Food, food packaging, ingredients, processing

Source: Resilinc Supply Chain Mapping Network

Central American Countries

GDP Growth Rates



Top Exports: Bananas, coffee, cotton, sugar

Advanced Manufacturing: Medical devices in Costa Rica

General manufacturing: Apparel, food and related

Median age: 26-28 years

Unemployment: 4%-8%

Poverty Rate: 7-66% (Honduras)

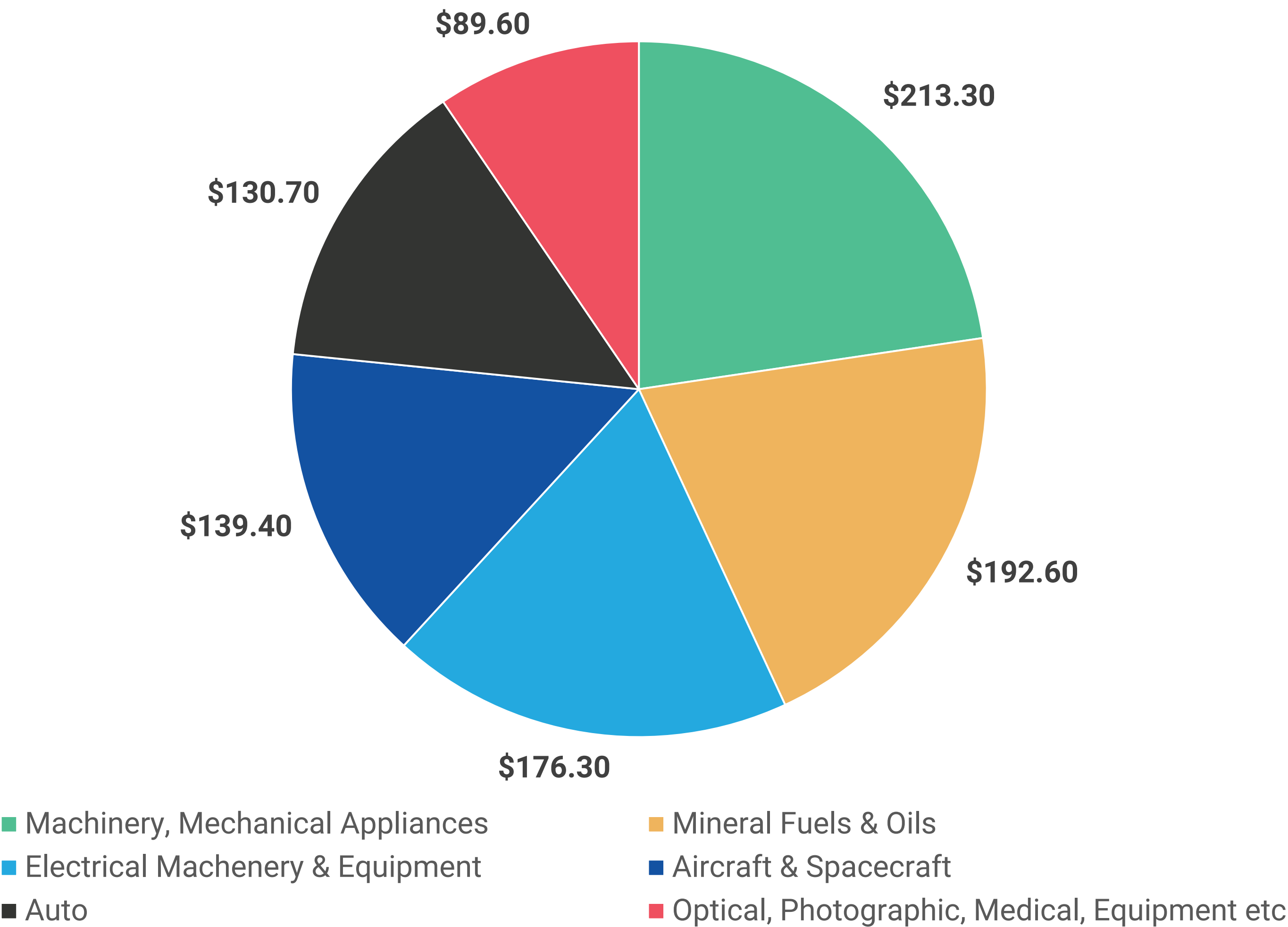
Resources:

Nickel, iron ore, fish, timber, oil, water

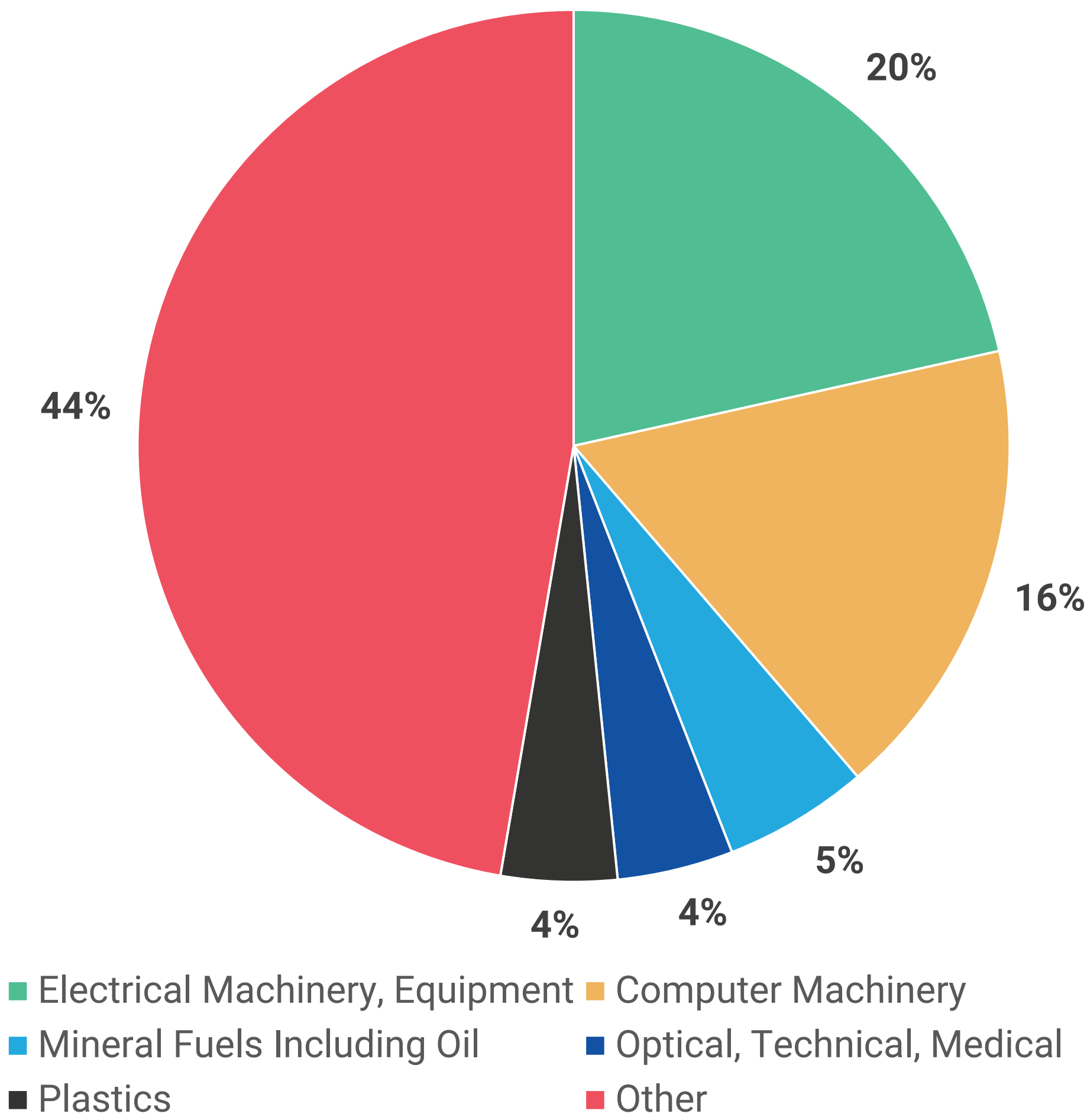
Percent of GDP on Infrastructure: ~2%

Top Export Commodities by Location

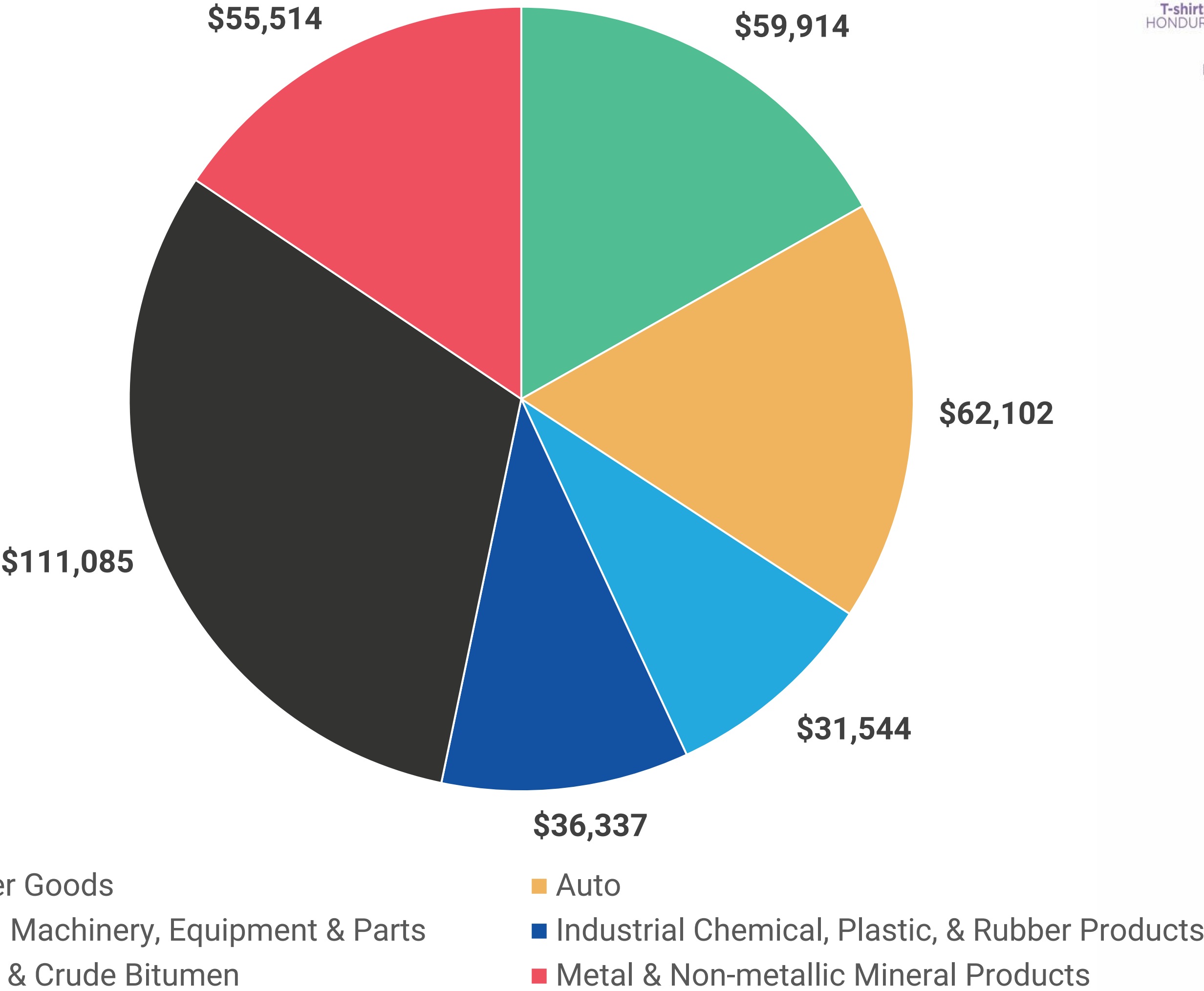
US Top Export Commodities 2020 in Billion USD



Mexico Top Export Commodities 2020



Canada Top Export Commodities 2020 in Million \$



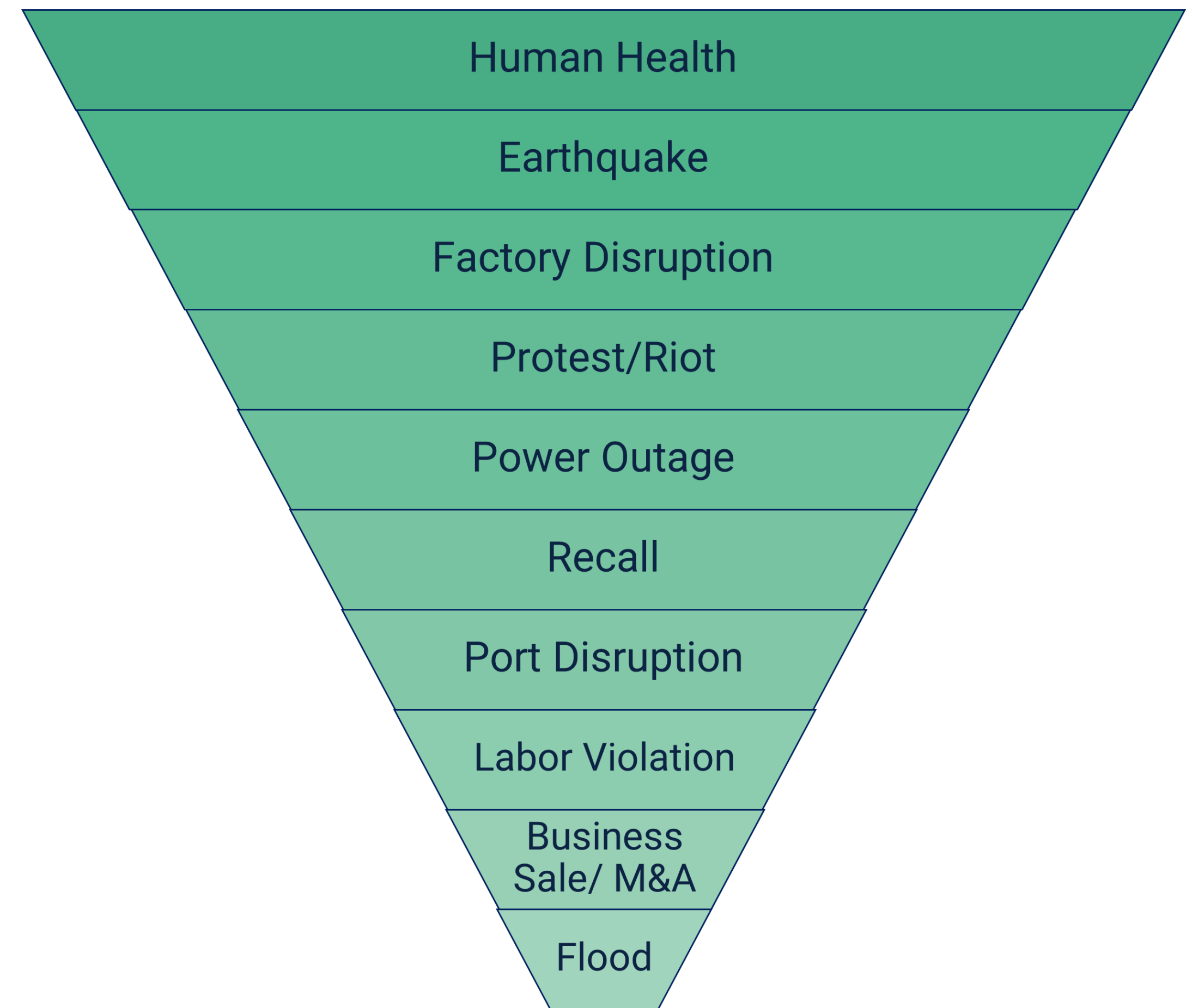
- Consumer Goods
- Industrial Machinery, Equipment & Parts
- Crude Oil & Crude Bitumen
- Auto
- Industrial Chemical, Plastic, & Rubber Products
- Metal & Non-metallic Mineral Products

Central and South America's Top Export Commodities



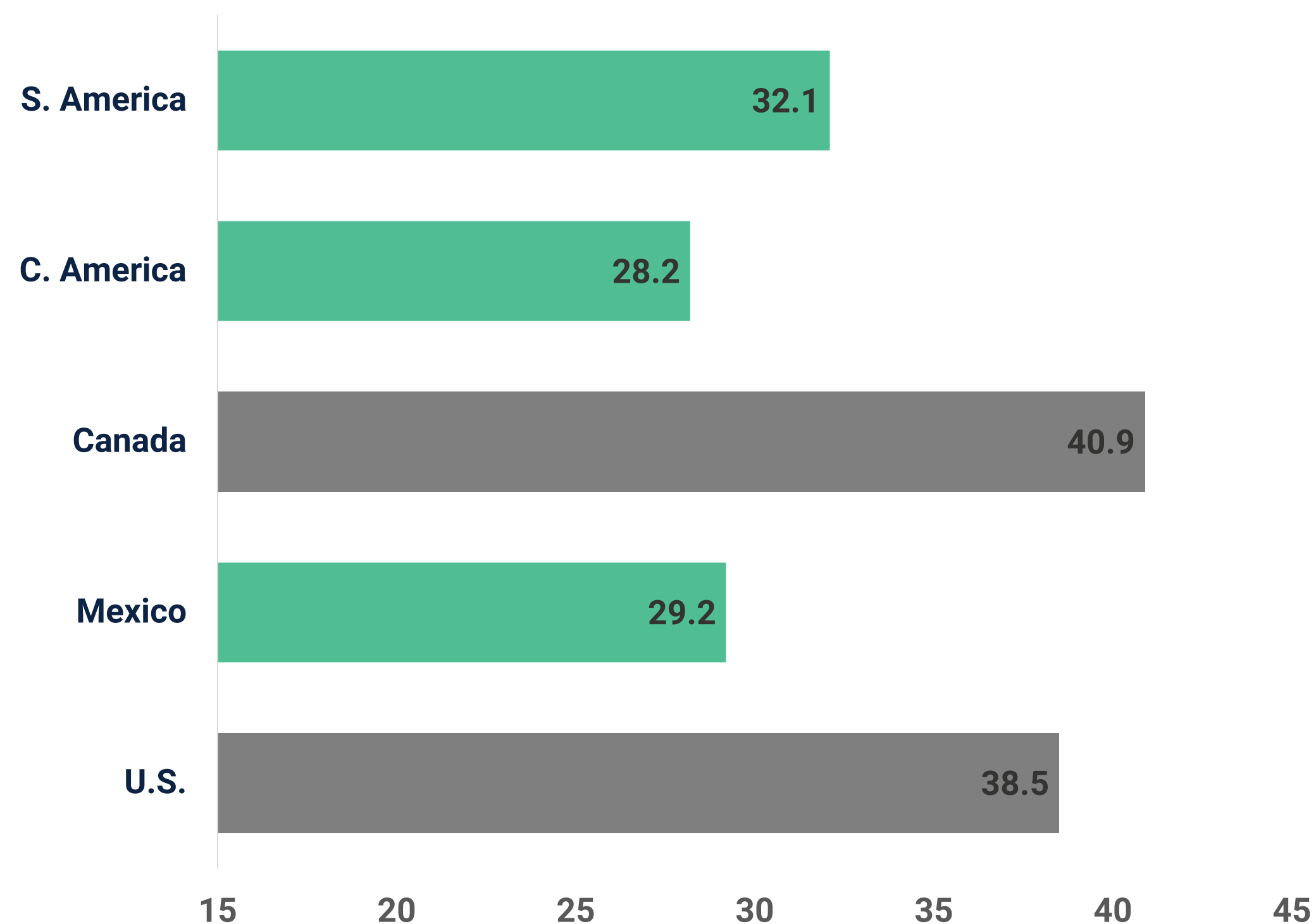
Disruptions in South and Central America

Source: Resilinc EventWatch Data Service

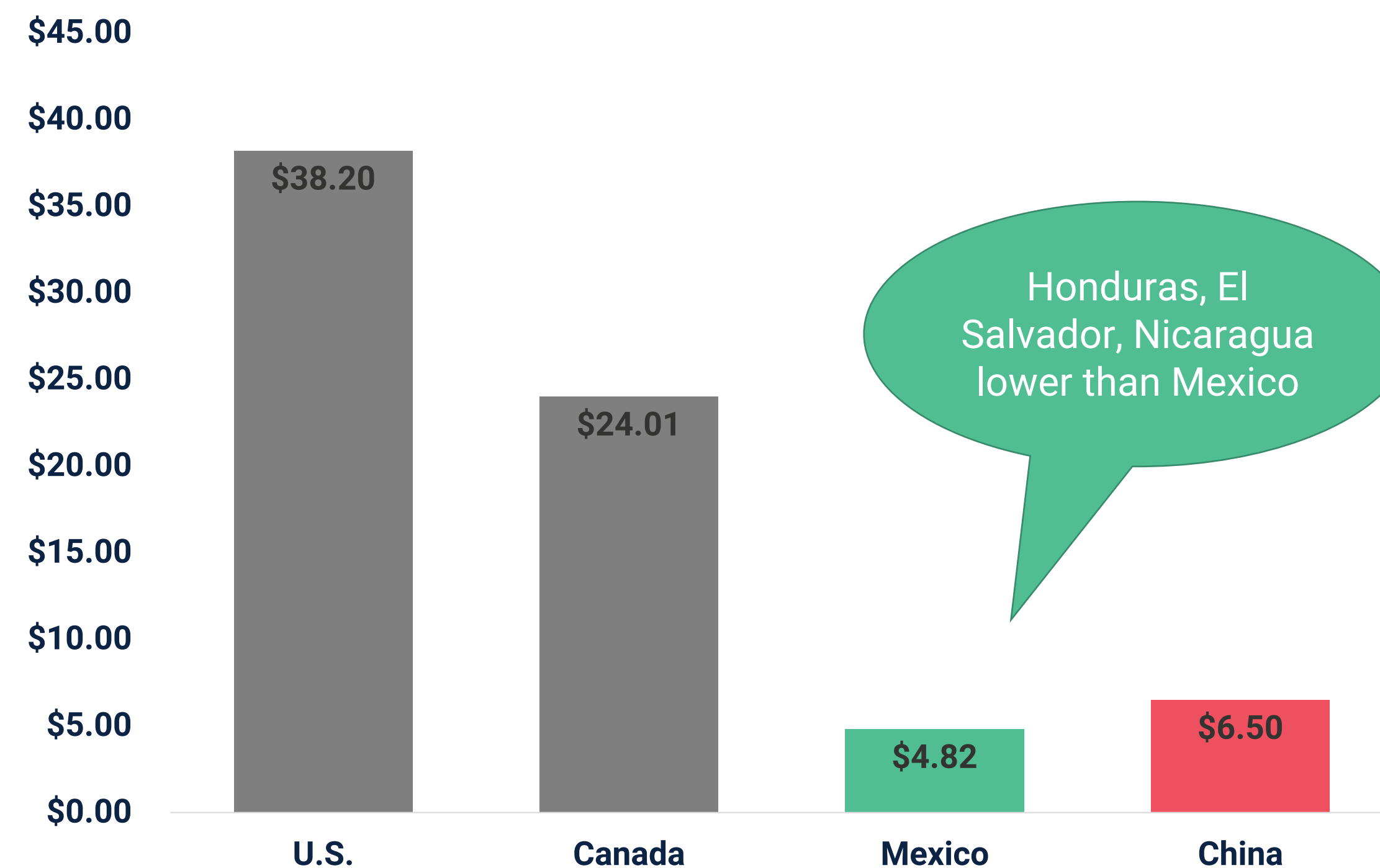


Demographics and Socio-economic characteristics

Median Age



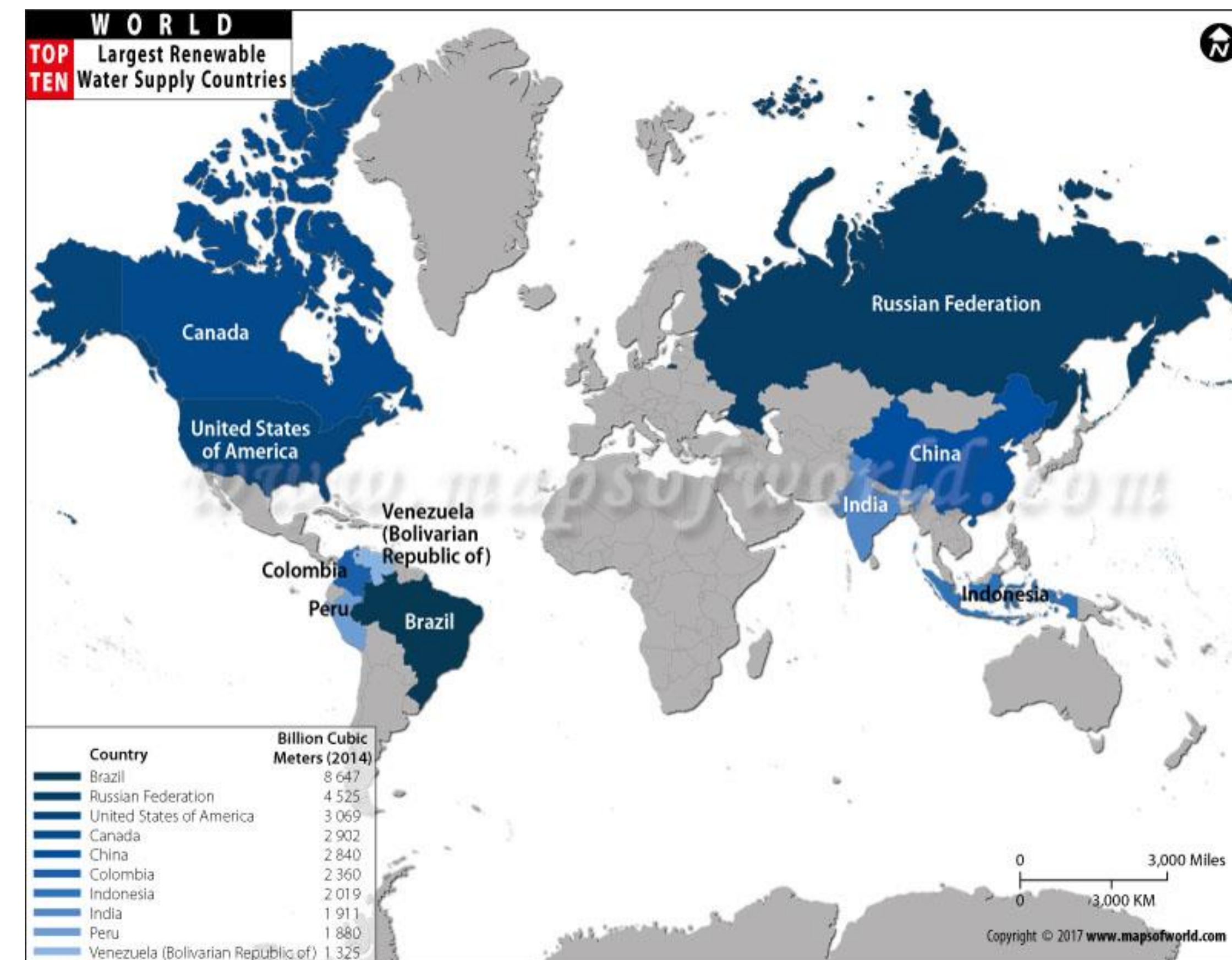
Manufacturing Labor Costs Per Hour



Renewable Water: Critical resource for manufacturing

5 of the top 10 countries with freshwater resources

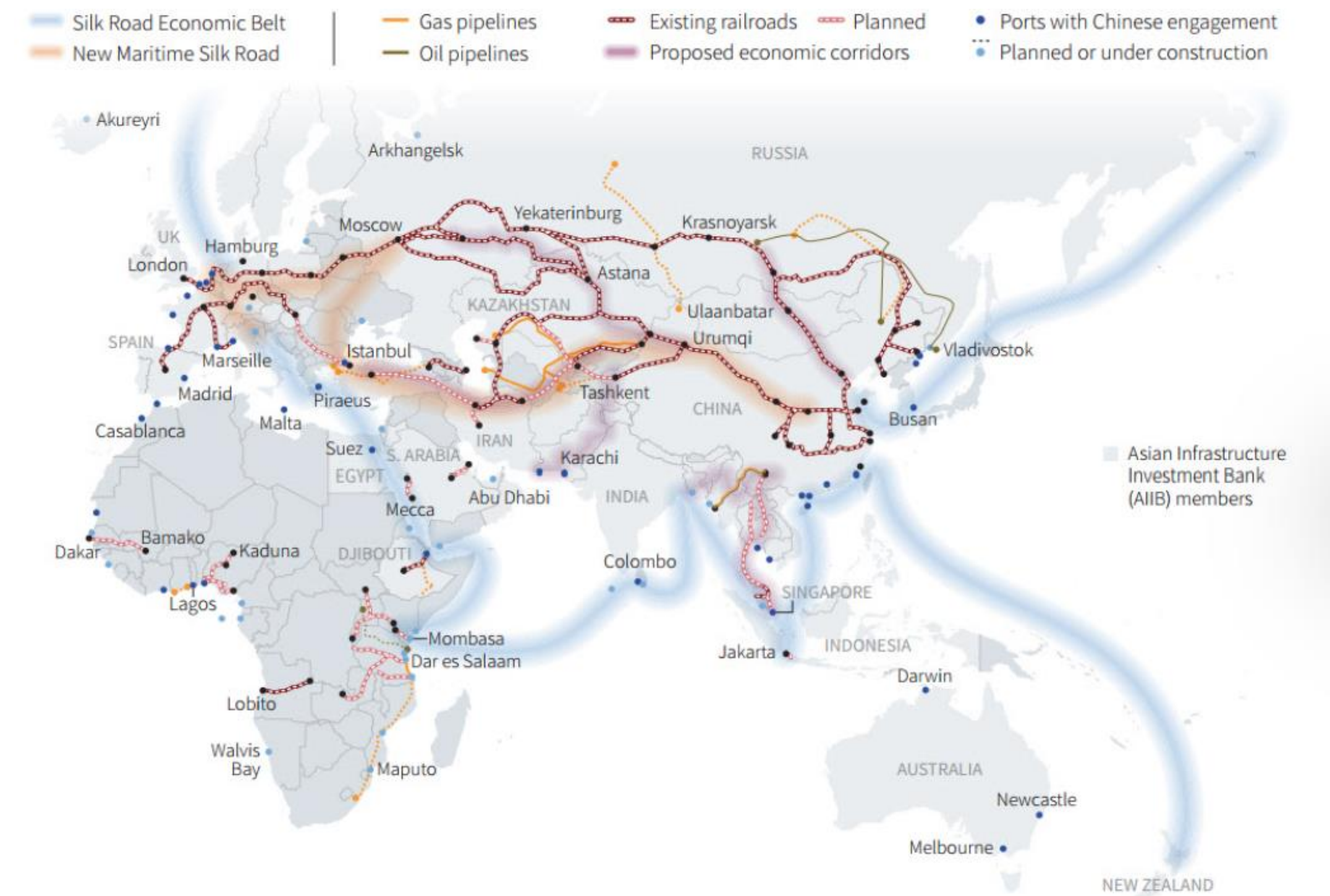
Country	Fresh Water (Cubic Kilometers)
Brazil 62% of power generated is hydroelectric	8,233
Russia	4,508
United States	3,069
Canada 60% of power generated is hydroelectric	2,902
China	2,840
Colombia 70% of power generated is hydroelectric	2,132
European Union	2,057
Indonesia	2,019
Peru 70% of power generated is hydroelectric	1,913



Final Thoughts

- Challenges to overcome
- How to monetize
- Working together across nations and industries
- Public – private collaboration
- Learning from incumbents (food, apparel)

Projects under China's Belt and Road Initiative



Source: Mercator Institute for China Studies.

C. Inton, 23/04/2018

REUTERS

Questions...

Melissa to intro

Melissa to intro

Bindiya to intro,
Tom – speed - cash implications
Dale – impact of delays

Bindiya to intro
Focus is on pain points – not
benefits

Introduce concept

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The supply chain imperative

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Labor availability
Climate Readiness (water)
Cash and Inventory reduction

Delayed days Shanghai - East Coast
Delayed days Shanghai - West Coast

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Near term:

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Medium to long term:

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Connecting to Central
America

Why do this...

Data

Data

Data

1 Modernizing the North and Central American Highway

2 Bridging the Darién Gap

3 Connecting the Continents

Pan American Highway

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The supply chain imperative

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The strategic imperative

National security
Immigration
Geopolitical value
Reduced dependence on China
Improved relations with neighbors
Alignment of interests
Counter narcotics trade

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A thriving ecosystem of suppliers critical to key industries

Auto, steel, chemicals, electronics, pharmaceuticals, apparel and footwear, and appliances

>17,000 suppliers with sites in South America

Colombia: 2,115 Suppliers
Ecuador: 661 Suppliers
Peru: 701 Suppliers
Chile: 939 Suppliers
Argentina: 1,952 Suppliers
Brazil: 10,423 Suppliers
Paraguay: >100 Suppliers

Top part & product categories mapped to S. America

Source: Resilinc Supply Chain Mapping Network

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Top Export Commodities by Location

US Top Export Commodities 2020 in Billion USD

Mexico Top Export Commodities 2020

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Canada Top Export Commodities 2020 in Million \$

Central and South America's Top Export Commodities

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Disruptions in South and Central America

Source: Resilinc EventWatch Data Service

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Demographics and Socio-economic characteristics

Median Age

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Final Thoughts

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Projects under China's Belt and Road Initiative

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Questions...

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Data

Dale

Tom

Bindiya then Tom, then
Dale

Back to Melissa for Q&A