

The state of freight integration in Complete Streets: a text-mining analysis of existing U.S. policy

June 29, 2026

ITE Western District Meeting

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A word of acknowledgement



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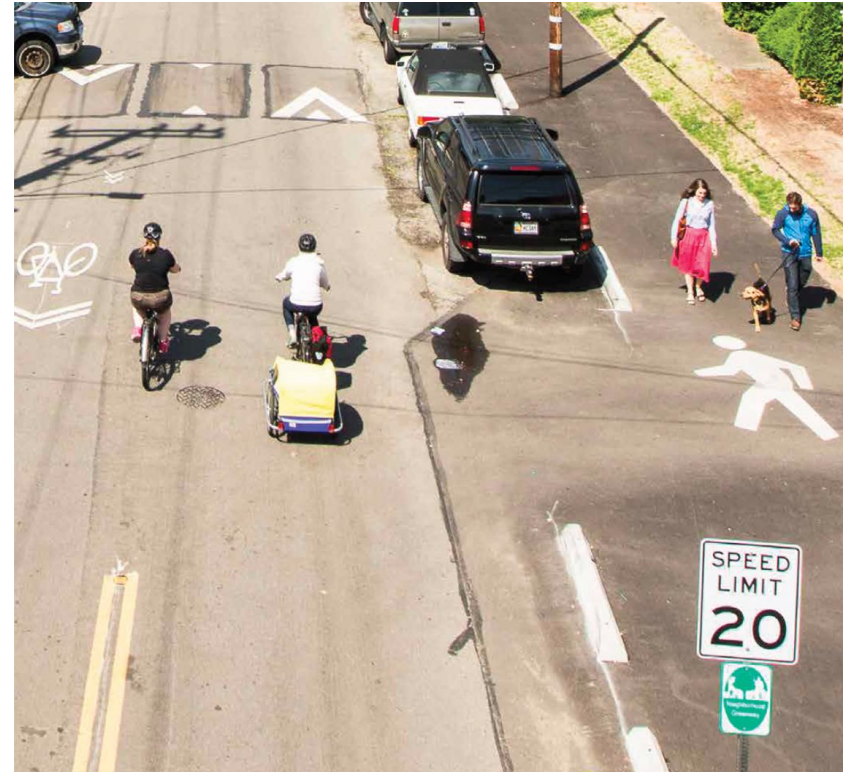


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Defining Complete Streets

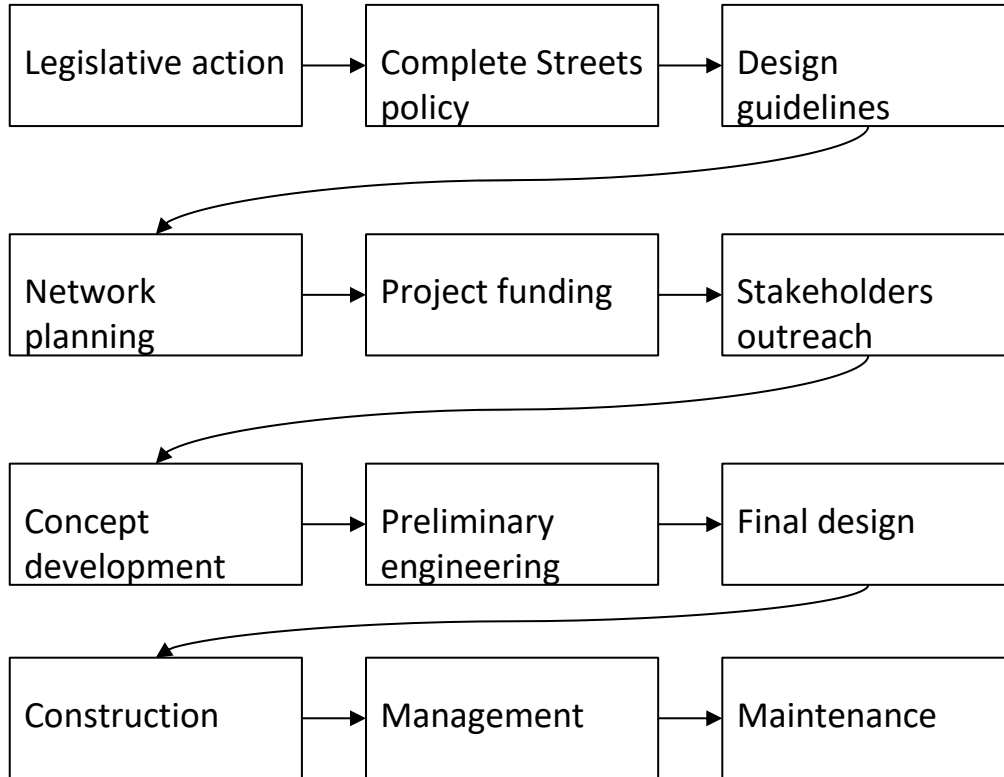
Began as a movement in early 2000s

Per the Infrastructure Investment and Jobs Act,
“The term ‘Complete Streets standards or policies’ means standards or policies that **ensure the safe and adequate accommodation of all users of the transportation system**, including pedestrians, bicyclists, public transportation users, children, older individuals, individuals with disabilities, motorists, and **freight vehicles**.”



Source:
Infrastructure Investment and Jobs Act (U.S. 117th Congress, 2021);
Moving to a Complete Streets Design Model: A Report to Congress on Opportunities and Challenges (FHWA, 2022)

Complete Streets policy and delivery



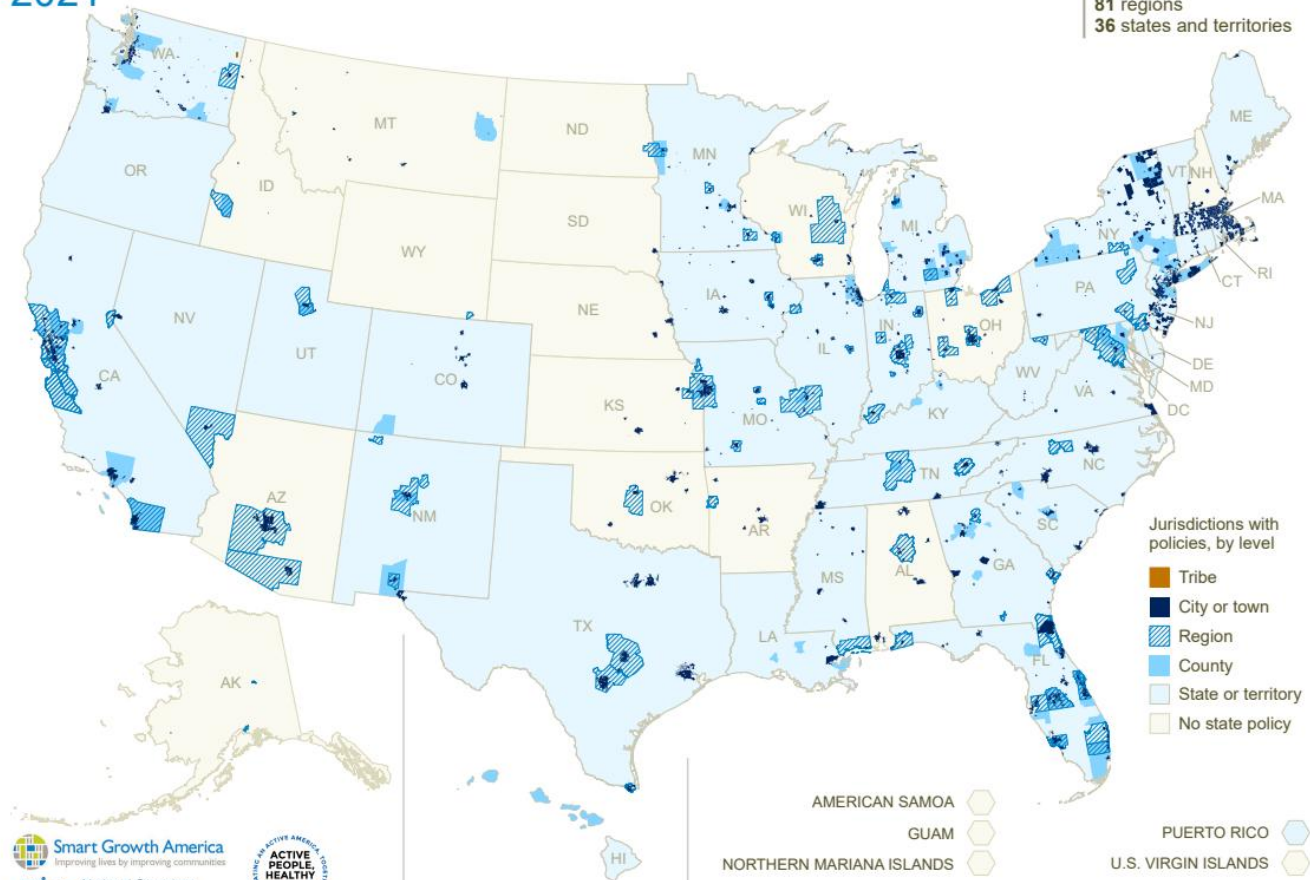
Complete Streets approach encompass all steps in policy development and capital delivery process, influencing current and future road infrastructure in the US.

Over 1,700 Complete Streets policies have been adopted across 35 State governments (Source: SGA)

Complete Streets Policy Adoption

1,533
jurisdictions
with policies

1,320 cities and towns
95 counties
1 tribe
81 regions
36 states and territories



Data source: Complete Streets Policy Inventory, as of 2022-04-14.

Complete Streets fundamentally represents a paradigm shift in transportation planning and design philosophy.

What does it look like?

Before Complete Streets

After Complete Streets

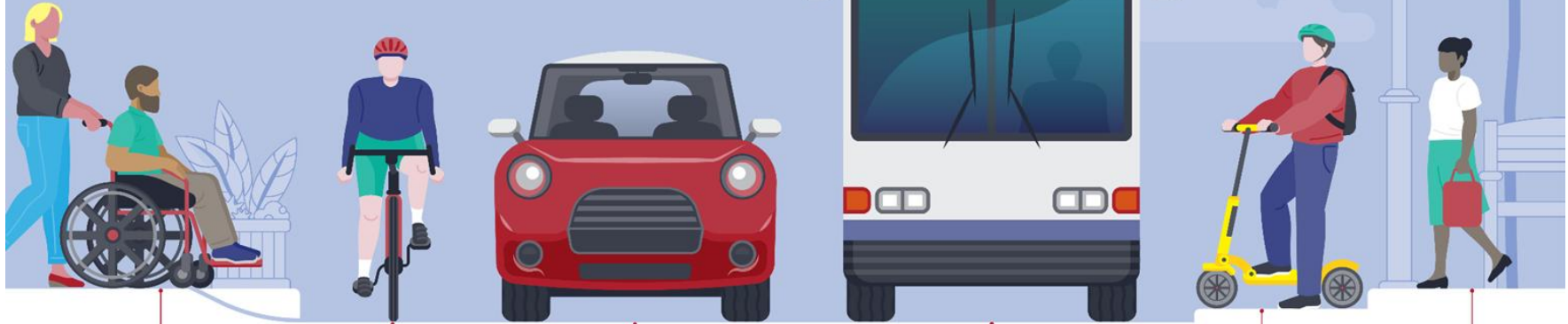


National Complete
Streets Coalition

Source: [National Complete Streets Coalition](https://www.nationalcompletestreetscoalition.org/)

WHAT ARE

COMPLETE STREETS?



**Space for
PEOPLE**

Curb ramps, crosswalks, and curb extensions to make it easy for pedestrians to cross streets and access destinations

**Space for
BIKES**

Designated connected routes and low-stress facilities that support people riding bikes, e-bikes, and scooters

**Space for
CARS**

Traffic calming measures and design cues to encourage slower speeds and driver awareness of vulnerable road users

**Space for
MASS
TRANSIT**

Bus pullouts, shelters, transit-only lanes, and signal priority to create transit-friendly roadways

**Space for
SHARED
MOBILITY**

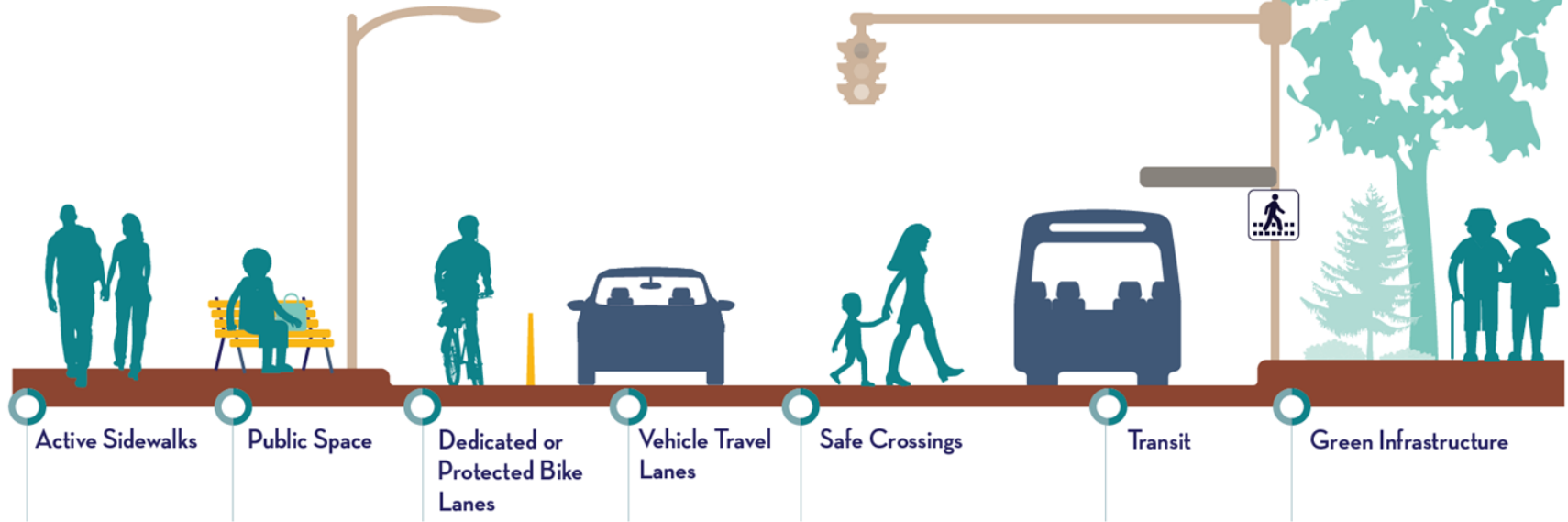
Designated curb-side space for shared bike and scooter parking that separates users from traffic, and keeps sidewalks clear and safe

**Space for
REFUGE**

Street furniture, parks, lighting, and public green spaces that promote gathering and social interaction

Source: [City of Poulsbo, WA](#)

WHAT IS A COMPLETE STREET?



Source: [City of Santa Fe, NM](#)

Where is freight?

Historically, freight has been omitted from Complete Streets planning and practice

- Few Complete Streets policies and design guides provide meaningful inclusion for freight (Conway et al., 2019)
- Meta-analyses that study Complete Streets policy and practice, analyzing the ‘completeness’, potential case studies, or outcomes (positive or negative) of implementing policies often omit freight
- “Freight” is an amalgamous term

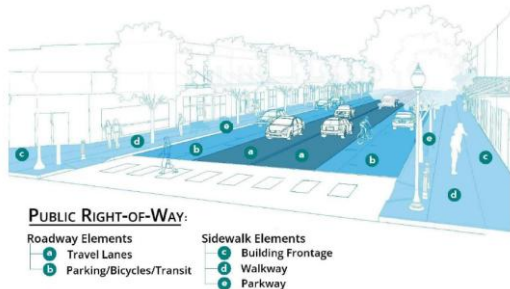
Why does this matter?

A lack of inclusion at the policy level



can lead to unsafe on-street behaviors

COMPLETE STREETS ELEMENTS



A lack of planning or design considerations given to freight operations, vehicles, or on-foot or cargo bike operators

→ **Municipality doesn't plan or design for freight operations with new street projects**



A lack of performance metrics that track whether CS is meeting the needs of [freight as] a road user

→ **Municipality doesn't update their existing CS methods or course correct via management strategies**



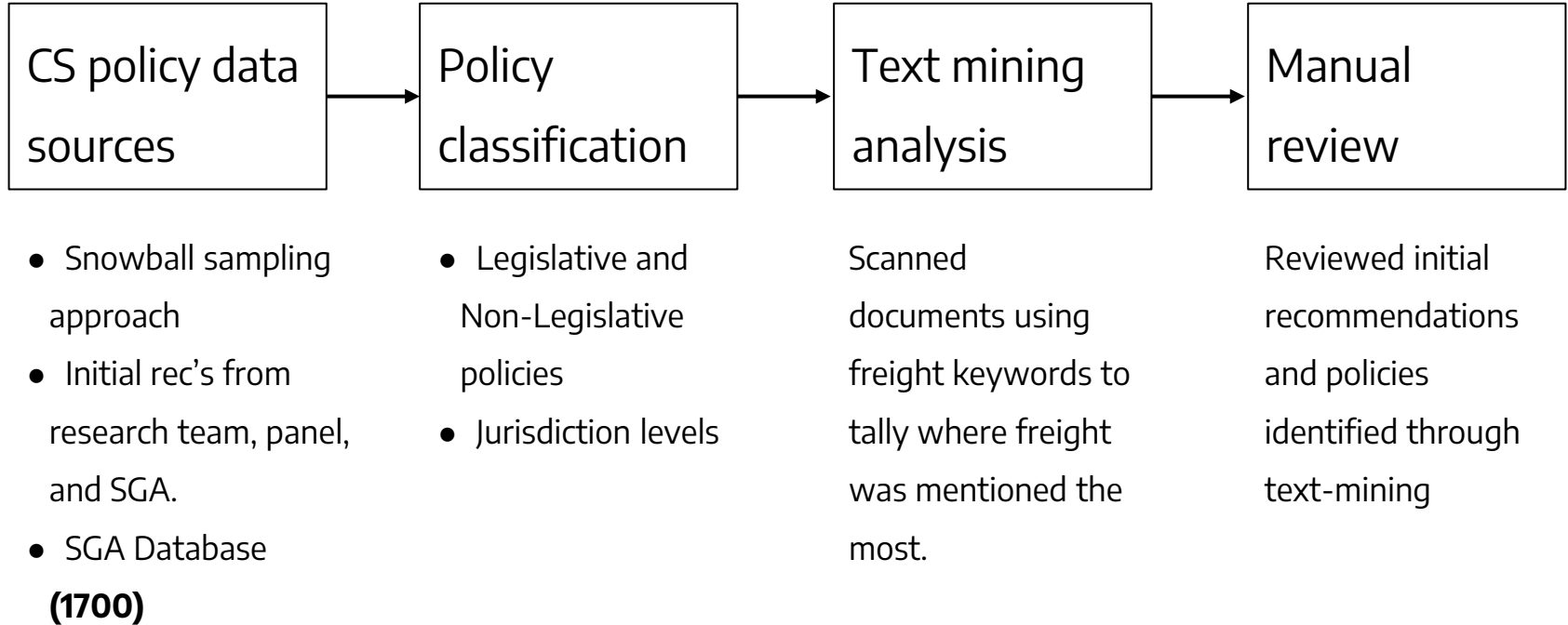
Which stem from a lack of consideration

With this in mind, a major goal of the NCHRP project was to scan Complete Streets policies to identify gaps and best practices.

This was achieved (partially) through a text-mining analysis

Methodology

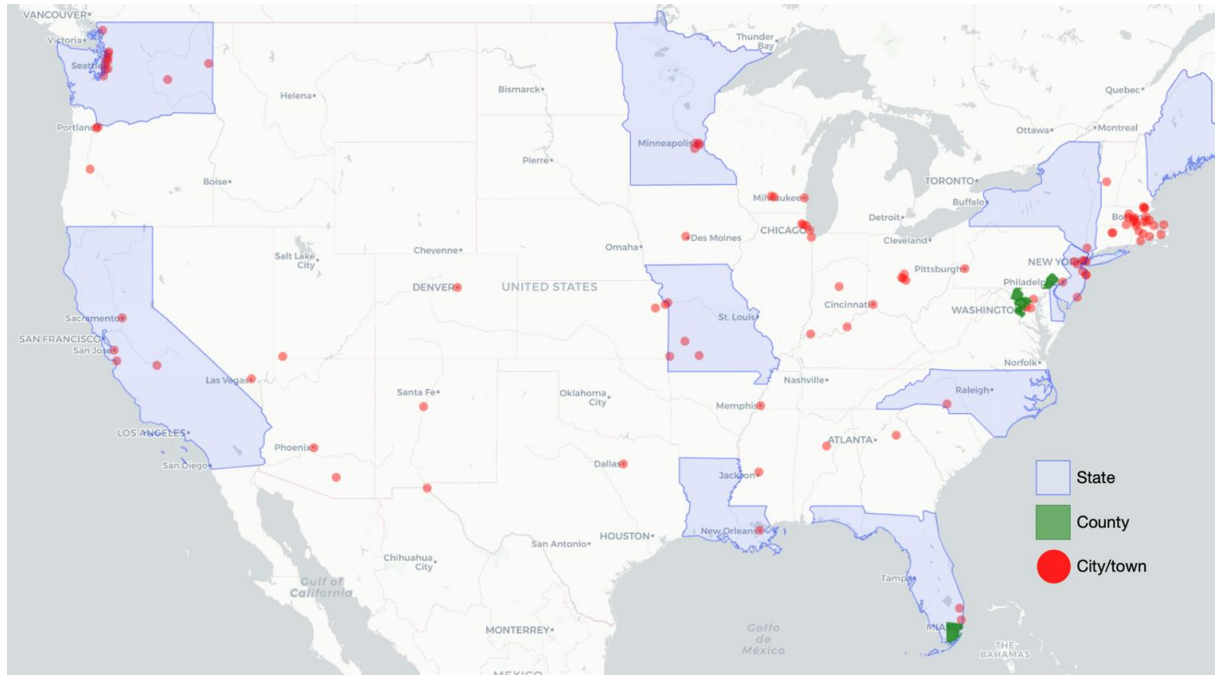
Methodology overview



A selection of freight-related keywords was used to identify and categorize policies

- Text-mining algorithm developed in R studio (coding language)
- Terminology related to vehicle types, operations and activities, and general keywords were used (e.g., freight, truck, commercial vehicle, goods movement, load/unload)
- Policies were grouped into statistical buckets (high, middle, low) for their **“mention-level”** which represents the number of keyword mentions per number of pages
- Policies were qualitatively reviewed based on mention-level results

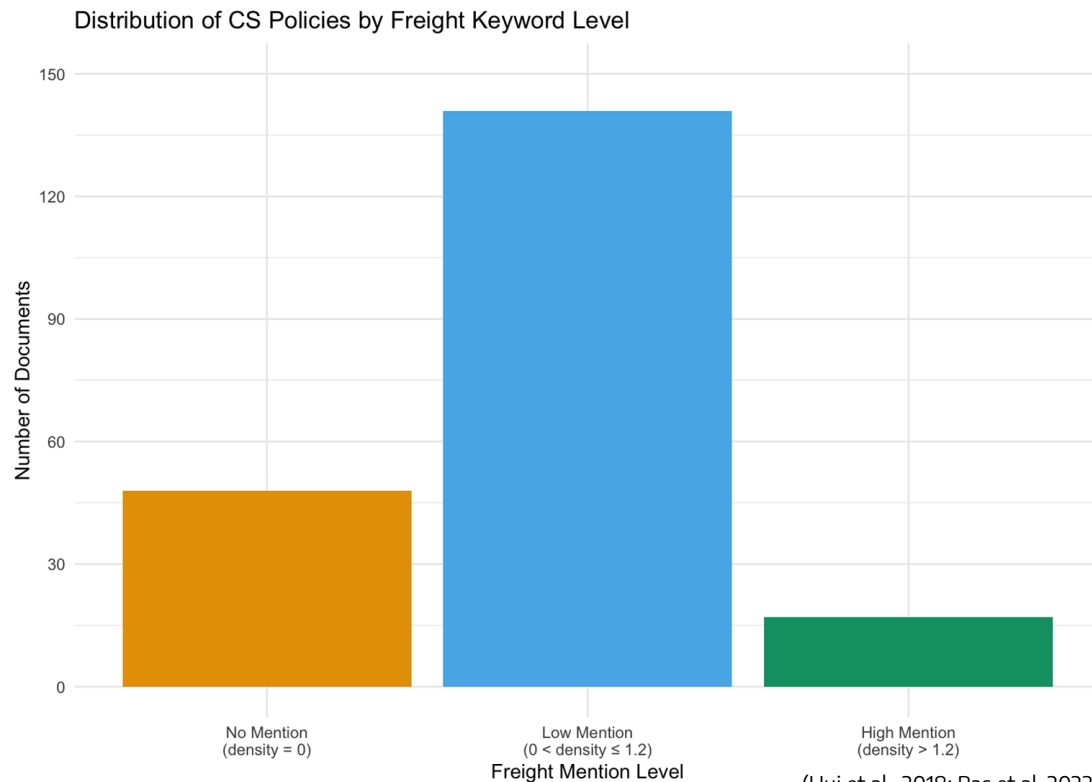
A range of policies were selected for text-mining from various levels of municipal government and transportation agencies.



A total of **250** policies were scanned and used in subsequent text-mining analysis, with a selected **100** policies chosen for further qualitative review.

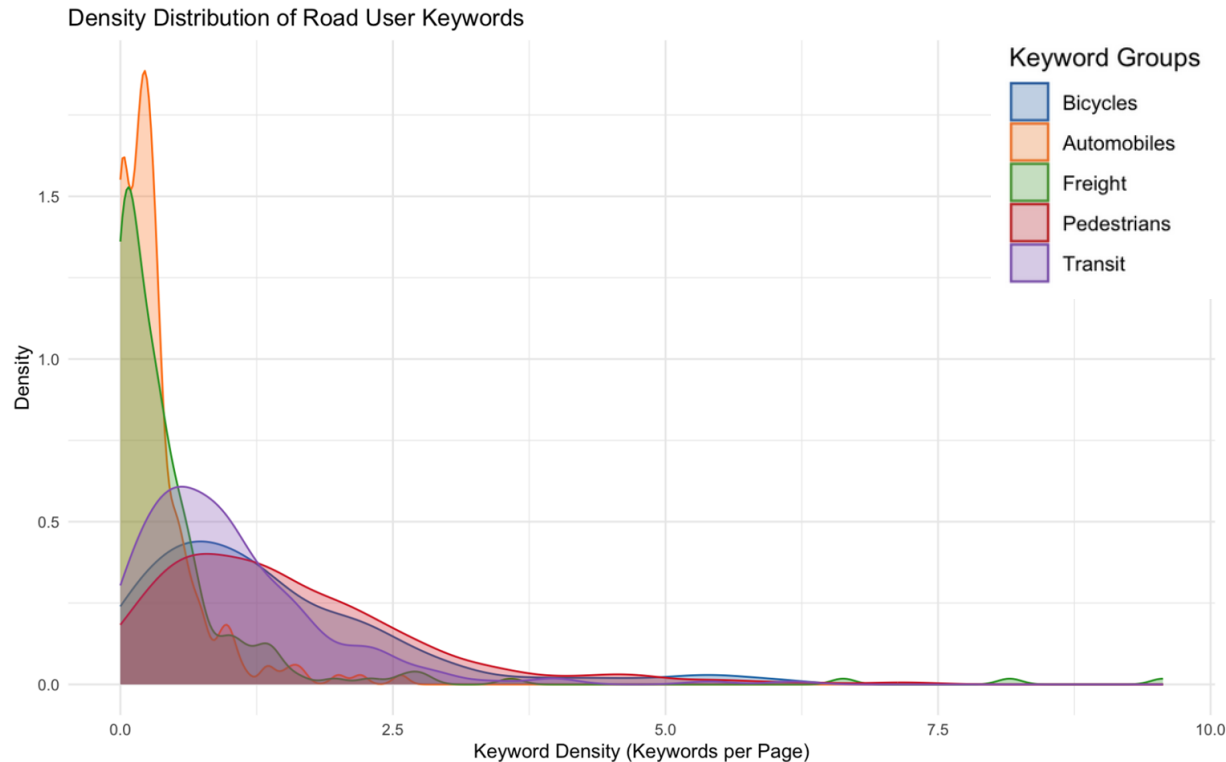
Results

R1: A systematic literature review of CS policies (n=206) revealed that freight is rarely included



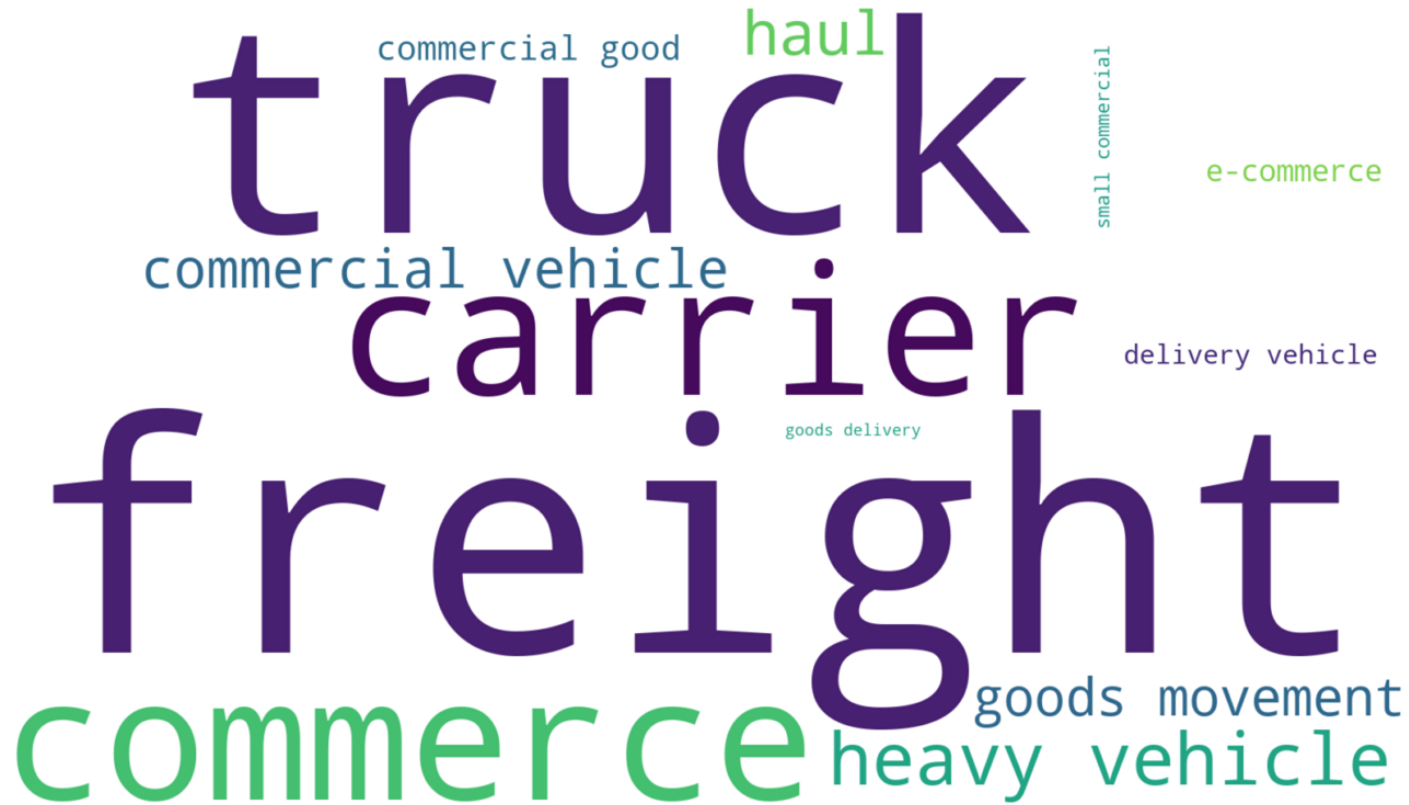
Results are consistent with previous qualitative or meta-analyses of CS policies and projects reaffirming that CS is largely aimed at supporting or vulnerable road users (pedestrians and bicyclists)¹ and doesn't typically address freight vehicles or operations².

R2: Keyword density analysis revealed that freight is mentioned less frequently than other road users in CS policy



Freight, as a user group, and in terms of describing its operations, and activities, is mentioned less frequently than other road users (if mentioned at all).

R3: Freight is also defined and described inconsistently in CS policy



Wordcloud of Freight-related Keywords across CS Policy

The results highlight a gap in many elements of CS policies across the United States

- General user inclusion and consideration
- Lack of inclusion in terms of planning and design in capital projects
- Lack of performance measures
- Lack of funding or planning support
- **Potential for unintended outcomes or conflicts between freight and other road users (often VRUs)**

While freight is integrated well in some cities and states across the US, these locations stand as exceptions from the rest.

**Stay tuned for the upcoming NCHRP
guidebook coming later this year!**

Questions?