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Identifying Underserved Areas using Administrative Child Passenger Safety Data

Findings from the National Digital Car Seat Check Form

WESTAT @ FCSM 2024

The views presented are those of the author(s) and do not represent the views of any Government Agency/Department or Westat

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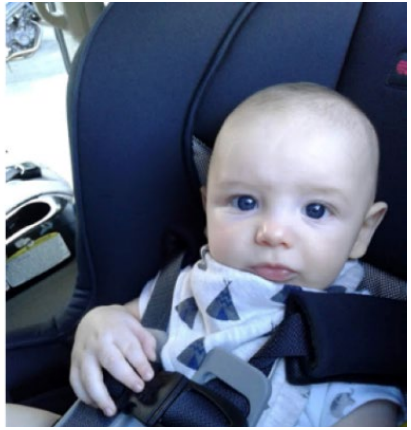
Agenda

- Child passenger safety data landscape
- National Digital Car Seat Check Form (NDCF)
- Combining NDCF (admin) and ACS data
  - Interactive maps

Child Passenger Safety | The Challenge

- **88% of child passengers under age 13 are restrained** with either a seat belt or child restraint system (CRS) (Enriquez 2021)…
- …but restrained does not mean properly restrained or safe. Studies show that **between 46%-95% of car seats are installed or used incorrectly** (Greenwell 2015, Tsai & Perel 2009)



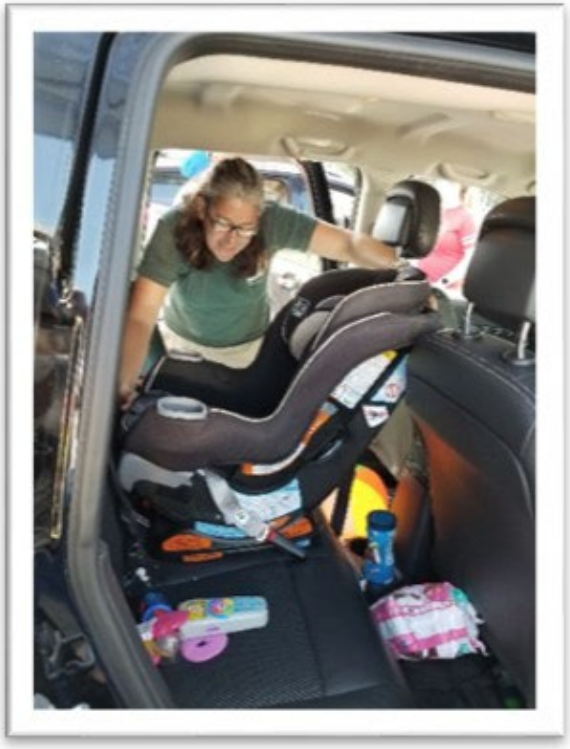
- **Correctly used child restraints reduce fatalities by 54-71%**, depending on the child's age and vehicle type (Kahane, 2015; National Center for Statistics and Analysis, 1996).

Child Passenger Safety | The Challenge

- **We need data on use, misuse, and non-use of car seats**
  - To target education for parents and caregivers
  - To allow CPS agencies to target often-limited resources to the most urgent needs
  - To shape policy and lawmaking (e.g., rear-facing until 2 years old)
  - To justify funding further research
- **Three major audiences for data and analysis:**
  - Parents and caregivers
  - CPS technicians and advocates
  - Researchers

National Digital Car Seat Check Form (NDCF)

- There are more than 35,000 certified child passenger safety technicians (CPSTs) in the United States who have historically documented all car seat checks using paper forms
- NDCF is an optional, alternative online tool with web-based or mobile apps
- Designed for users (primarily CPSTs) **and** researchers/data management
- Allows CPSTs, agencies, car seat/vehicle manufacturers, and researchers to access current administrative data on car seat use and misuse



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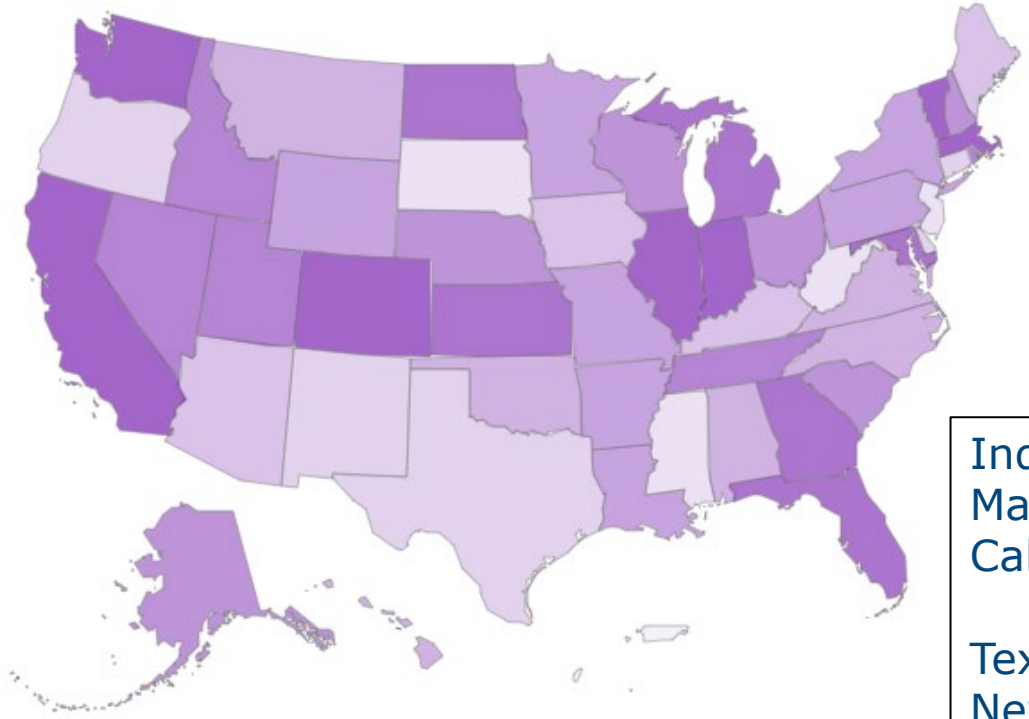
Underserved Populations:

Where are car seat checks missing children?

NDCF Coverage: Geography as of 2023



Indiana: 40,911 checks
Massachusetts: 12,572 checks
California: 12,157 checks

Texas: 441 checks
New Jersey: 76 checks
South Dakota: 10 checks

NDCF Demographic Distribution in 2023

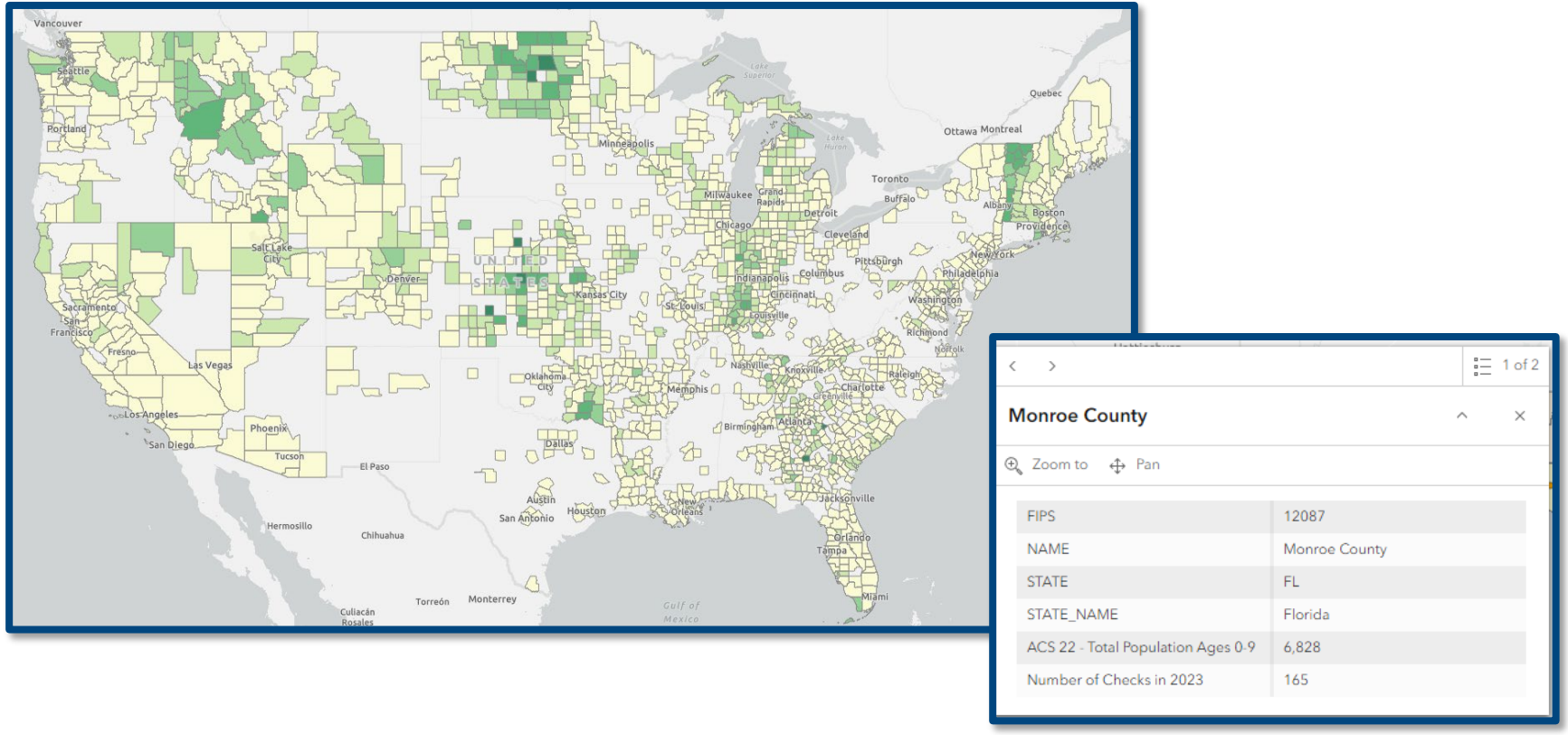
Child Age	Unborn	Infant (<1)	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9+ years	Un-known
Count	20,582	18,484	9,935	6,383	5,161	4,179	2,815	1,779	1,183	677	621	6
%	29%	26%	14%	9%	7%	6%	4%	2%	2%	1%	1%	0%

In 2023, less than 10% of checks were for children over the age of 5

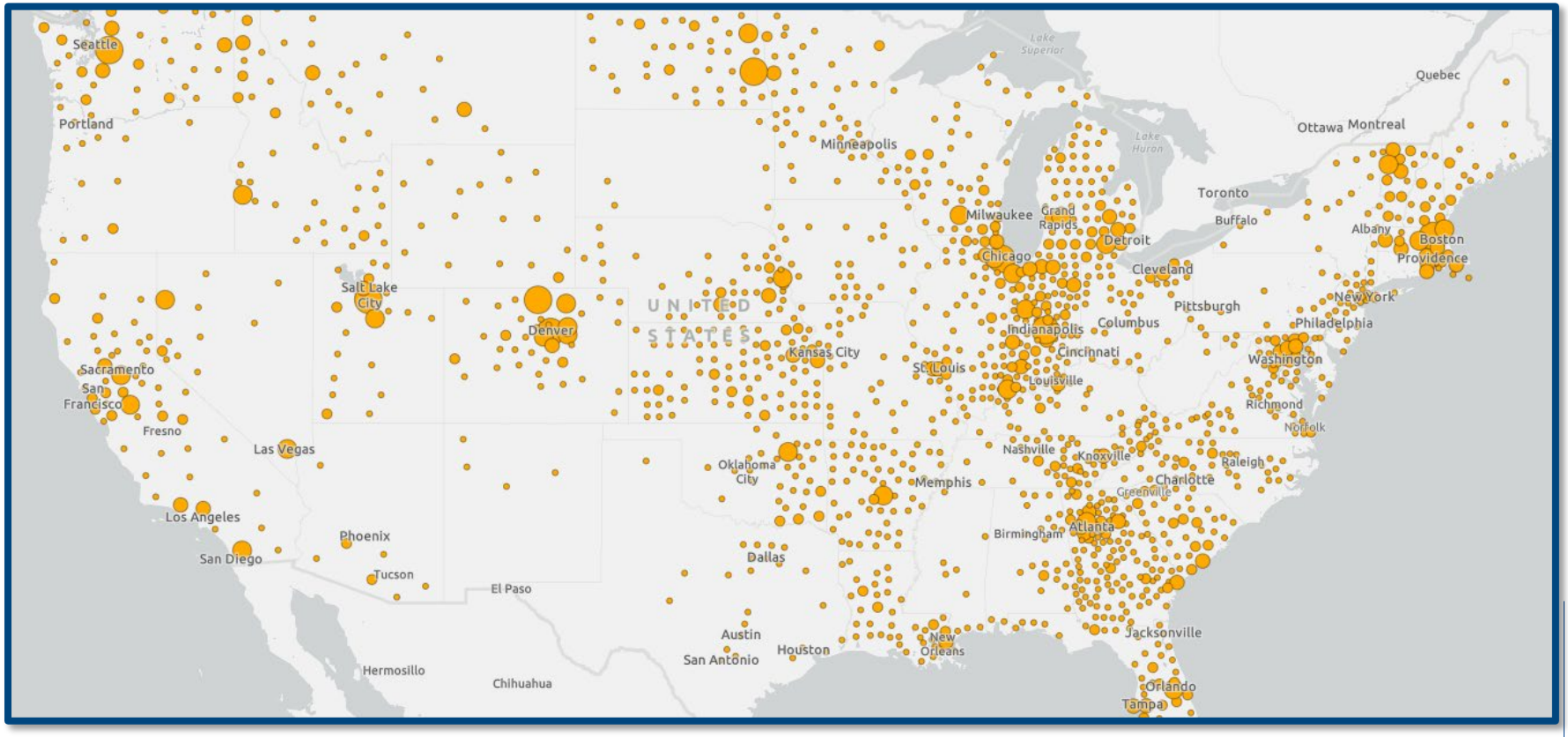
Leveraging ACS Data

- NDCF only collects caregiver ZIP code– no other identifying info due to privacy concerns
- Use a geographic overlay to map 2022 5-year ACS tract-level estimates to ZIP codes
  - Simple proportional assignment for tracts that are in multiple ZIP codes
- Variables considered:
  - Children aged 0-9
  - Non-white/minority status
  - Commute method and length
  - Poverty status
  - Education
  - Employment
  - Median household income

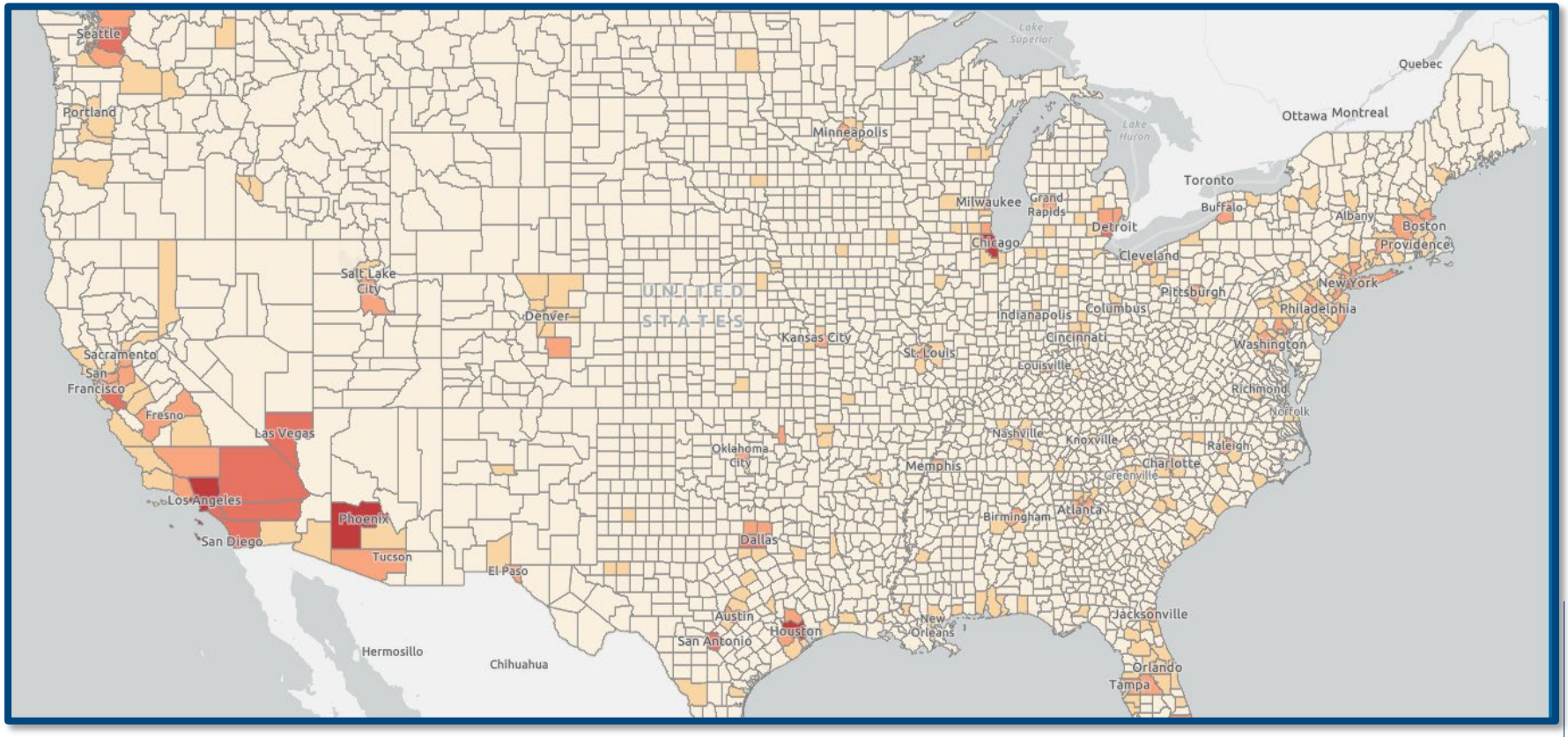
Interactive Map: NDCF Checks in 2023 per 1,000 Children, by County



Interactive Map: Number of Checks in 2023, by County



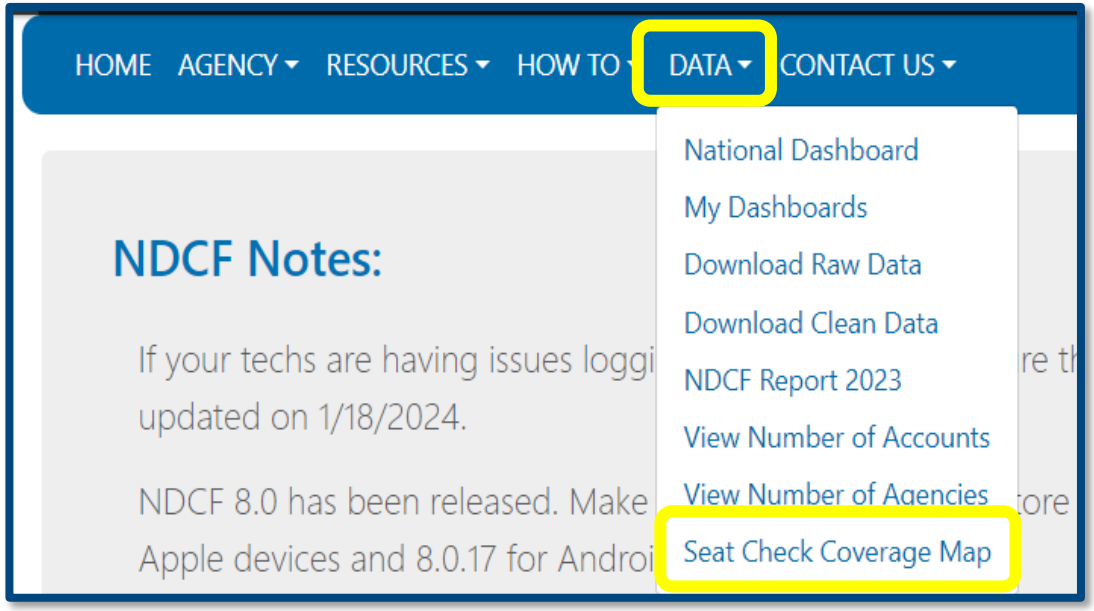
Interactive Map: Population Ages 0-9, 2022 ACS 5-year



Interactive Map: Technicians

Interactive Map: Public Access

These maps and other public NDCF dashboards available at carseatcheckform.org



Underserved Areas: Preliminary Findings

Linear regression on checks per 1,000 children in 2023, limited to the 23 states with "adequate" NDCF coverage (defined as ZIP codes including >75% of children ages 0-9 represented in dataset)

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	15.59	1.13	13.78	<0.0001
Percent non-white	-5.33	1.11	-4.79	<0.0001
Percent commuting less than 20 mins	8.91	1.59	5.61	<0.0001
Percent commuting via walking or biking	27.94	4.71	5.93	<0.0001
Urban area	-4.01	0.53	-7.53	<0.0001
Percent of population ages 0-9	-66.19	7.44	-8.90	<0.0001

Conclusions and Future Research

- The NDCF fills an important gap in child passenger safety research, providing detailed and up-to-date information on car seat misuse.
- Data as-is are not representative of child passengers nationally, but when supplemented with national survey data can be useful to examine high-level trends
- Critical to provide data that can be used by technicians and agencies "on the ground" as well as for policymaking
- As sample sizes grow and data hopefully become more representative, more detailed analyses may be possible
  - Trends in misuse
  - Geographic and/or demographic subgroups

Selected References

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Thank you

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