

Meeting begins at 1:30 pm



01

Please mute your mics

02

Please use the raise hand option to be recognized during discussion

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Please state your name and organization after being recognized

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The Q&A feature can be used to submit questions during presentations



Greater Houston Freight Committee



July 18, 2024

July 18th Agenda

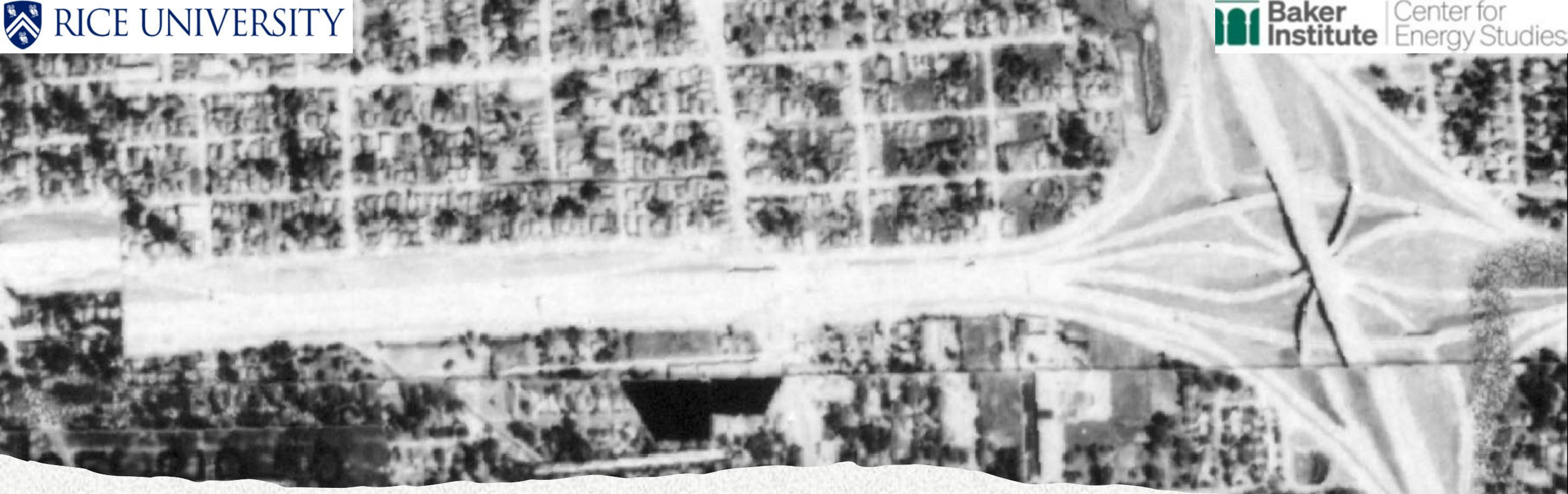
1. Opening and Welcome
2. Innovative Intersections: Freight Considerations
3. The History of Houston's Freeways and What Does It Mean for the Future
4. Union Pacific: Houston Milestones, Recent Achievements, and Future Innovations
5. Announcements
6. Adjourn

Presentations



Innovative Intersections: Freight Considerations

- Amanda Austin P.E TxDOT Design Division Roundabout & Alternative Intersection Design (RAID) Lead



The History of Houston Freeways and What It Means for the Future

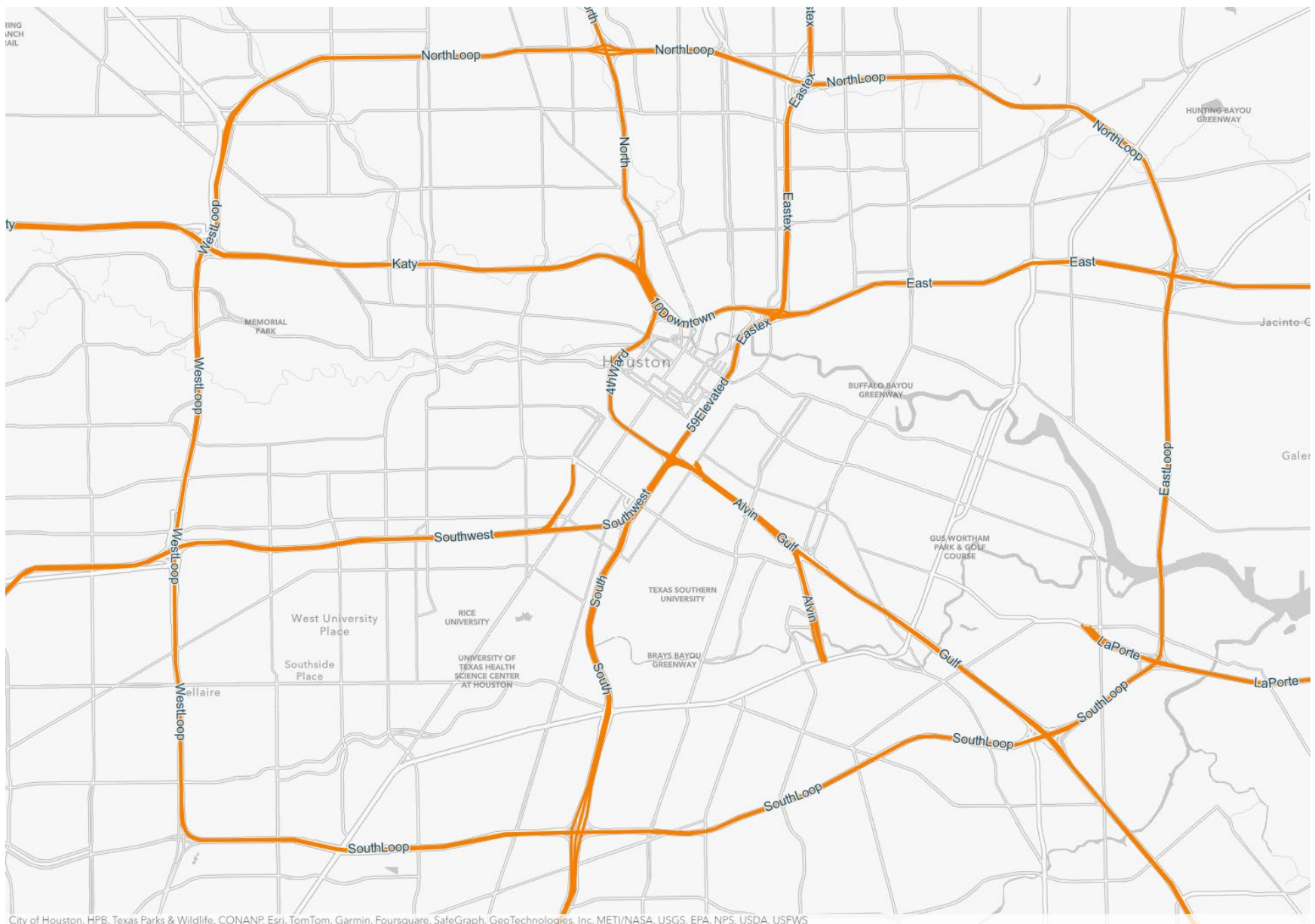
Ed Emmett

Fellow in Energy and
Transportation Policy

Baker Institute for Public Policy



Scope of the Project



City of Houston, HPB, Texas Parks & Wildlife, CONANP, Esri, TomTom, Garmin, Foursquare, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, USFWS



Highway Research Architecture

Historical Structures Ingest →

Archival Maps

Historical maps and photographs of Houston collected from multiple state and local archives, including Sanborn Fire Insurance maps, TxDOT R.O.W. maps, and historical aerial photography.

Mapping Buildings

Using ArcGIS, the Highways research team traces shapes of displaced structures.

Displaced Structures Database and Map

Buildings linked through street address to people who inhabited them at the time of highway clearance.

Displaced People Database

People linked through street address to building they inhabited at the time of displacement.

City Directory Records

Census records matched with yearly city directory records in order to correct outdated info.

Planning Maps and Historical Photography

Digitized and georeferenced by Highway team

Archived at Rice DSA

Permanent digital archive through Fondren Digital Scholarship Archive

Linked Database and Map

Databases and linked maps available on the open access *Houston Highways* project as part of the Center for Energy Studies and Spatial Studies Lab partnership. Data and map are interactive, searchable, downloadable, and sortable.

Research Outputs
Data and maps available to scholars, policy-makers, and the public. Research serves as a model for other cities.

Neighborhood Case Studies

Highways research team conducts case studies on a limited number of city blocks, finding the new addresses of families and businesses displaced

Historical People Ingest →

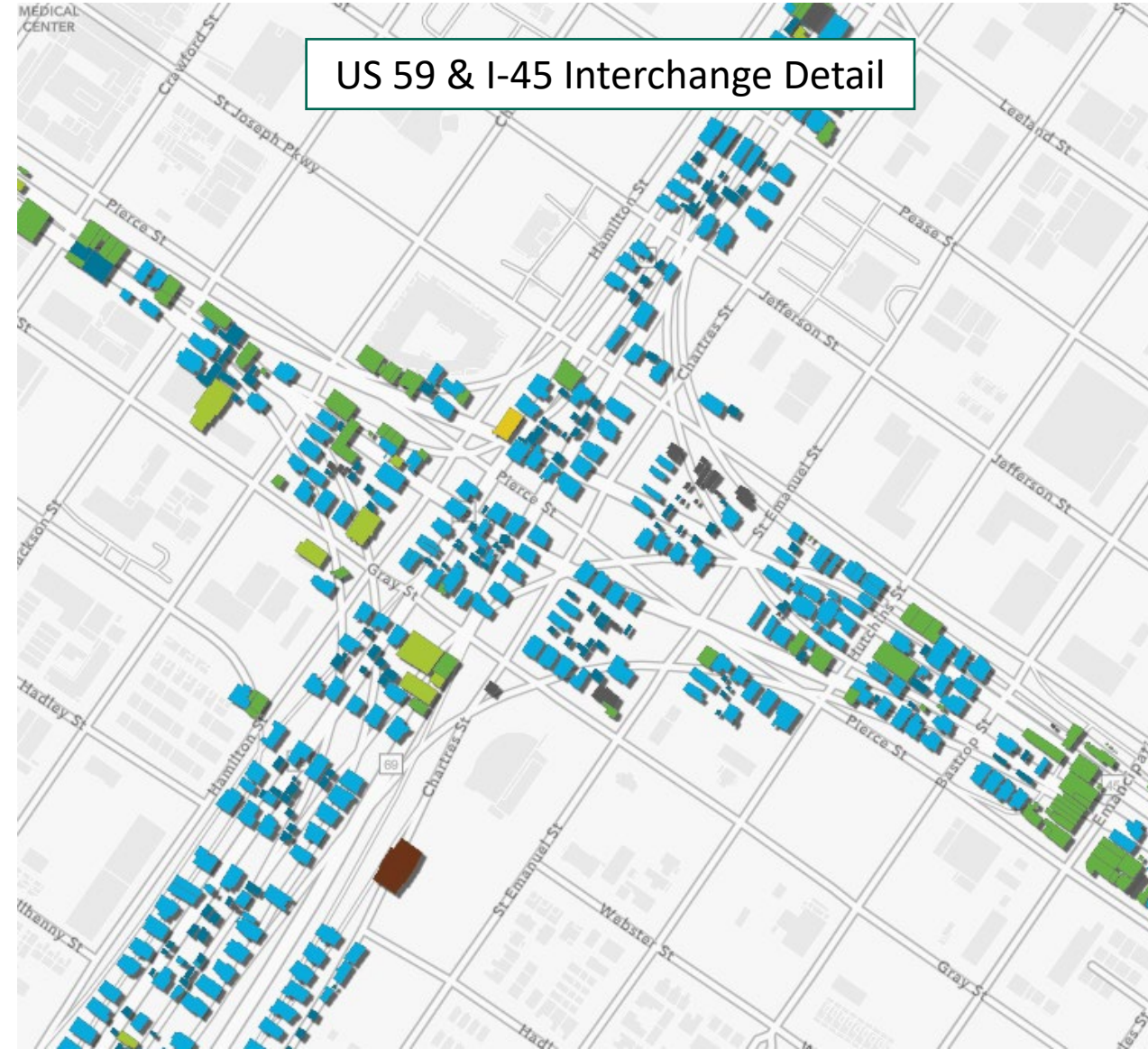
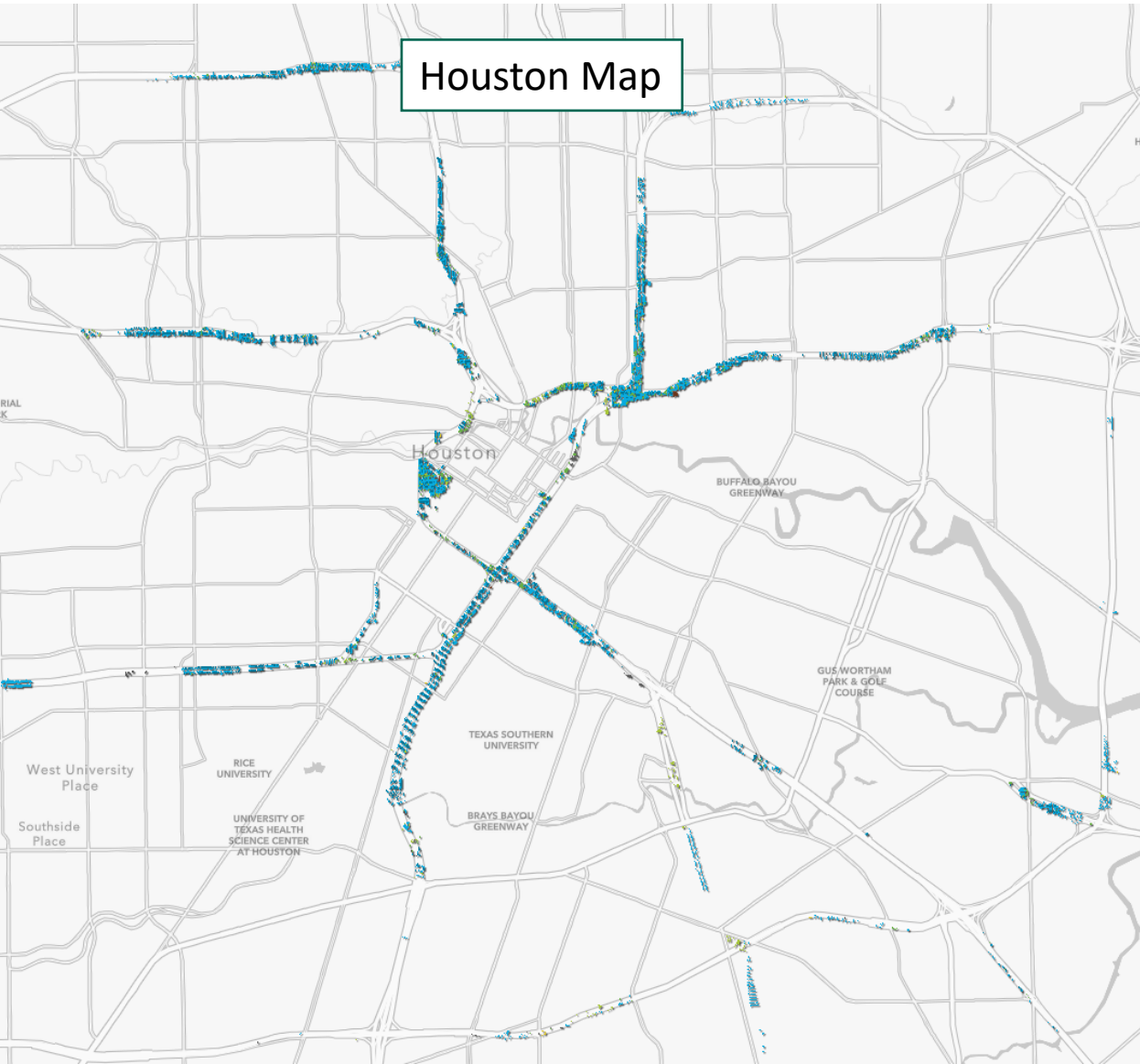
Archival Databases

Historical demographic and population records from local archives including the 1940 and 1950 US Census rolls.

Digitizing Databases

Data is scraped and cleaned from existing transcriptions of historical databaess and transcribed by OCR software and by hand.

Mapping Cleared Buildings






Demographics: Matched Census Rolls

Date and Highway		Residential Structures		People	
Source Date	Highway Section	Unmatched	Matched	Black	White
1950	4thWard	482	329	544	23
1950	East	674	610	800	362
1940	Eastex	630	634	545	734
1950	EastLoop	168	35	0	62
1940	Gulf	313	135	461	170
1940	GulfExpansion	210	114	359	20
1950	Harrisburg	167	62	2	151
1950	Katy	689	1102	241	680
1940	North	258	386	79	605
1950	NorthLoop	519	0	0	0
1950	PierceElevated	119	152	43	179
1950	South	551	1058	158	1196
1950	SouthLoop	194	31	0	68
1950	Southwest	554	414	66	409
1950	WestLoop	191	9	0	25
Combined	Grand Total	5719	5071	3298	4684
<i>Percentage</i>	<i>% of Total</i>	<i>53%</i>	<i>47%</i>	<i>41%</i>	<i>59%</i>

Key Findings

- Most freeways were aligned before Interstate Highway System
 - Disproportionate impact on minorities is complex
 - Segregated neighborhoods
 - Urban renewal
 - Timing of freeway alignments
 - Changing demographics
 - Analyze freeway by freeway, neighborhood by neighborhood
 - What were alternatives
 - Reconnecting neighborhoods is a false promise
 - Future highways and improvements will be necessary, but the process will be different
- 



[Center for Energy Studies | Baker Institute](#)

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Presentations



The History of Houston's Freeways and What Does It Mean for the Future

- Judge Ed Emmitt, Fellow in Energy and Transportation Policy, Center for Energy Studies



Innovative Intersections: Freight Considerations

Greater Houston Freight Committee



July 18, 2024

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Connecting you with Texas.

Agenda

3 | Innovative Intersections:

3 | What are they?

4 | Why are we doing them?

5 | TxDOT RAID/Innovative Intersections
Program Overview

7 | Freight Considerations

11 | Roundabouts:

11 | What are they?

12 | What makes them so safe?

14 | Other Benefits

15 | Accommodating OS/OW

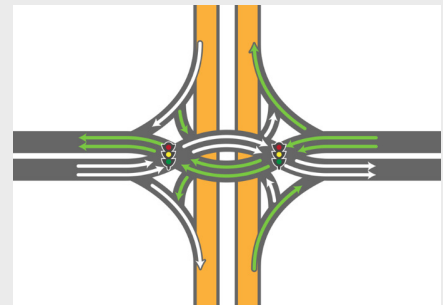
17 | Next Steps and Take-Aways

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Innovative Intersections: What are they?

- Any non-traditional intersection that reduces conflict points
- Most common:
 - Modern roundabout
 - Continuous green-T (CGT)
 - Median U-turn (MUT)
 - Restricted crossing U-turn (RCUT)
 - Displaced left-turn (DLT)
 - Diverging Diamond (DDI)
 - Single-Point Urban Interchange (SPUI)



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Innovative Intersections: Why are we doing them?

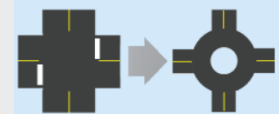
→ Why Alternative Intersections?

Reduced number and severity of conflict points = Reduced fatal and serious injury crashes

ROUNDABOUTS:

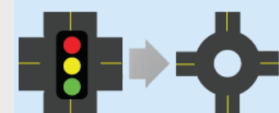
→ Lower speeds
+ reduced number and severity of conflict points
= **90%** reduction in fatalities

Two-Way Stop-Controlled Intersection to a Roundabout



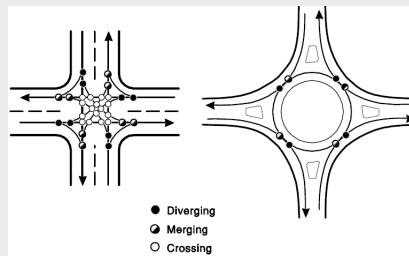
82%
Reduction in fatal and injury crashes¹

Signalized Intersection to a Roundabout



78%
Reduction in fatal and injury crashes¹

Two-Way Stop-Controlled to R-CUT:
→ **40%** reduction in injury crashes²
→ **70%** reduction in fatal crashes²

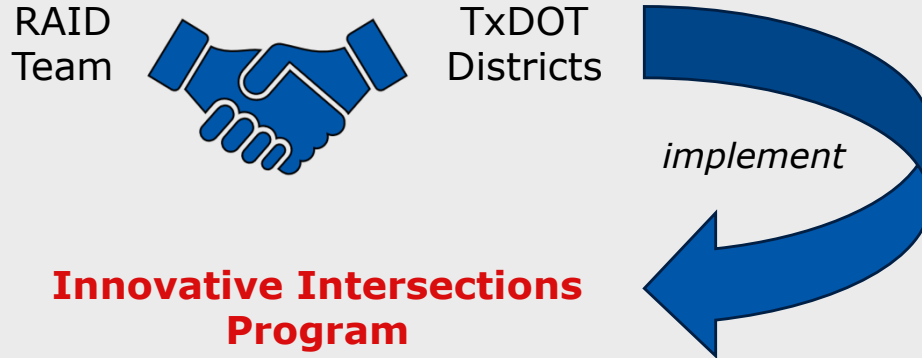


¹ (CMF ID: 211, 226) AASHTO. The Highway Safety Manual, American Association of State Highway Transportation Professionals, Washington, D.C., (2010).
² FHWA, Case Study, US Route 15 Corridor, Frederick County, MD, (July 2020), <https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-06/fhwasa14062.pdf>

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Program Overview

RAID = **R**oundabout & **A**lternative **I**ntersection **D**esign



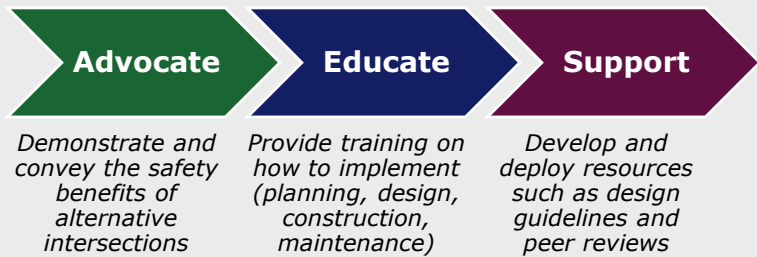
RAID/Innovative Intersections Program Overview

VISION

See an exponential increase in implementation of roundabouts and alternative intersections

See a corresponding decrease in intersection-related fatalities

MISSION



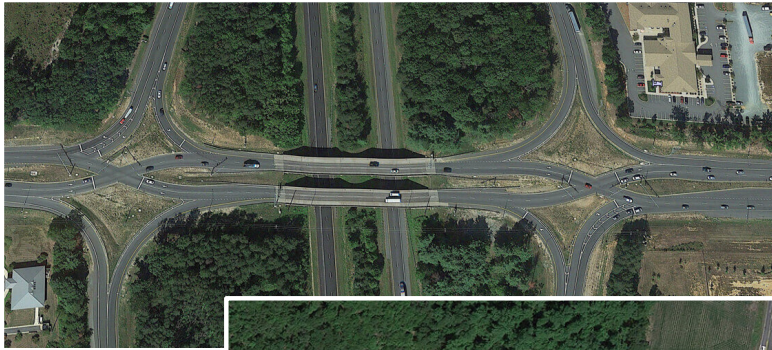
Key Accomplishments to-date:

- Formation of a Task Force
- Begun outreach, education and support
- Launched website and database
- Intersection Control Evaluation (ICE)

In-progress or upcoming:

- Info videos and fact sheets
- Training classes
- Updated guidelines
- Design Aids

Freight Considerations: Innovative Intersections



- Most innovative intersections will accommodate trucks & OS/OW as designed
- Some will need extra attention to accommodate swept path

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Freight Considerations: Innovative Intersections

- With proper design, any alternative intersection can accommodate heavy truck traffic
- Pay close attention to acceleration and deceleration lane design for U-Turn alternative intersections (MUT & RCUTs)

		U.S. Customary						
		M—Minimum Width of Median (m) for Design Vehicle						
		P	WB-40	SU-30	BUS	SU-40	WB-62	WB-67
		Length of Design Vehicle (ft)						
Type of Maneuver		19	50	30	40	40	63	68
Inner Lane to Inner Lane		30	61	63	63	76	69	69
Inner Lane to Outer Lane		18	49	51	51	64	57	57
Inner Lane to Shoulder		8	39	41	41	54	47	47

Exhibit 7-18. AASHTO-recommended minimum median widths for U-turn crossovers.

Title : Restricted crossing u-turn : informational guide. Creator(s) : Hummer, Joe;Ray, Brian;Daleiden, Andy;Jenior, Pete;Knudsen, Julia; Corporate Creator(s) : Kittelson & Associates; Published Date : 2014-08-01; Report Number : FHWA-SA-14-070; URL : <https://rosap.ntl.bts.gov/view/dot/29477>

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Freight Considerations: Roundabouts

- Big advantages for U-turns and avoiding full-stops
- Requires strategic truck aprons
- Know the design and check vehicles
- Latest design guidance recommends straddle-lane design*



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Freight Considerations: Roundabouts & Rail

- Gate placement
- Train speeds
- Frequency

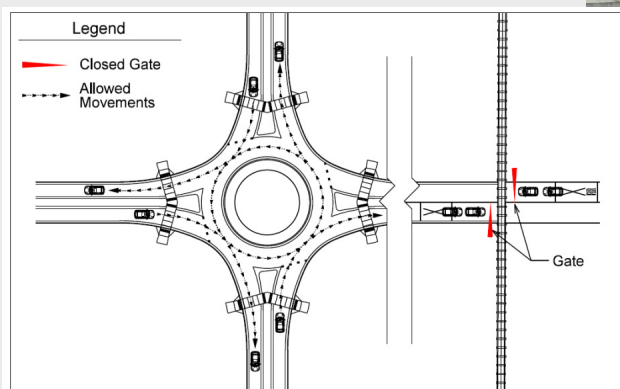


Figure 6-1. Gated closures exclusively at railroad crossing



- Distance to Rail
- Use of queue-cutter signals
- Escape lane an option to avoid a queue

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Roundabouts: What are they?

- Generally circular shape with counter-clockwise traffic flow
- Yield-at-entry
- Slow speed environment

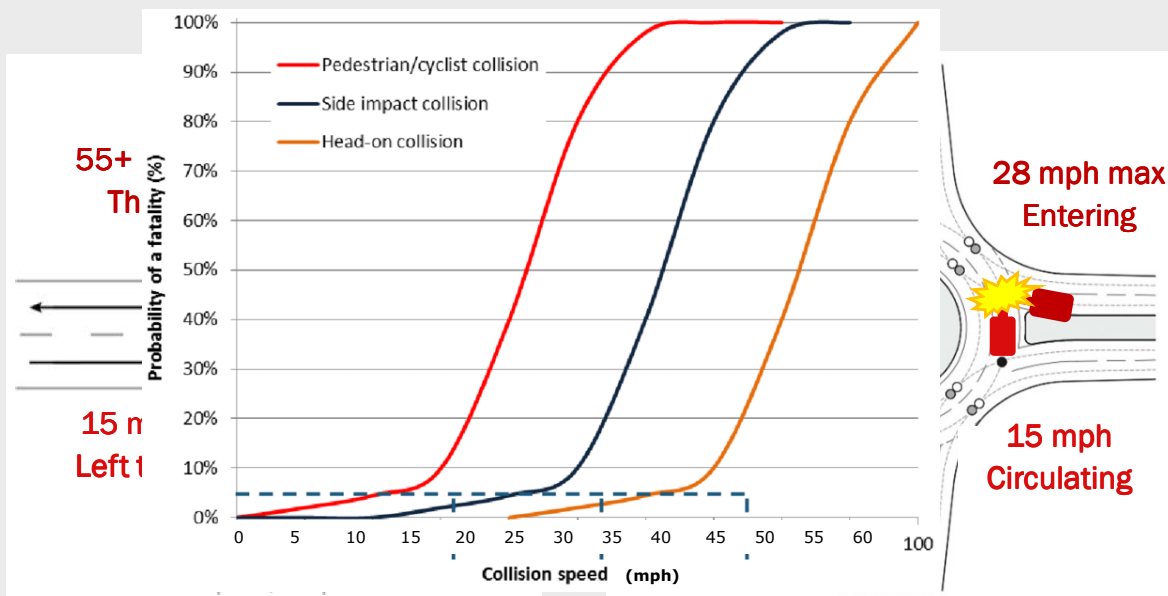
What is NOT a modern roundabout?

- High entering or circulating speeds (30 mph +)
- Circulating traffic yields to entering traffic
- Requires or allows changing lanes within the circle



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Roundabouts: What makes them so safe?



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Roundabouts: What makes them so safe?

- Reduced number & severity of conflict points + low speeds = forgiving with driver error
 - *"I don't have a problem with roundabouts – it's all the other drivers that don't know what they're doing!"*
- FHWA Study of 19 high-speed rural intersections converted TWSC to roundabouts¹
 - 62% reduction in all crashes
 - 85% reduction in injury crashes
 - **100% reduction in fatal crashes**

People: How much faith do you have in the human race?

Me:



¹ Isebrands, H., & Hallmark, S. (2012). Statistical Analysis and Development of Crash Prediction Model for Roundabouts on High-Speed Rural Roadways. Transportation Research Record, 2312(1), 3-13. <https://doi.org/10.3141/2312-01>

Roundabouts: Other benefits

Operations



Yield-on-entry best utilizes intersection space and reduces overall intersection delay



Reduced fuel consumption & less emissions

Maintenance/Long-term cost benefits

Reduced costs over time compared to a signal

Resiliency

Continues to function in a power outage

Multimodal Benefits*



Slower speeds + shorter crossings

Enhanced crossings at multi-lanes



Truck aprons + overall diameter allows for trucks of all sizes

*Pay extra attention to design and outreach to maximize benefits



Roundabouts: Accommodating OS/OW

- Proper design paired with well-placed truck aprons can allow for even oversize/overweight (OSOW) vehicles

Exhibit 10.3. Common inscribed circle diameter ranges.

Roundabout Configuration	Typical AASHTO Design Vehicle	Common ICD Range ^e
Mini-roundabout	SU-30	45 ft to 90 ft (14 m to 27 m)
Compact roundabout	BUS-40	65 ft to 120 ft (20 m to 37 m)
	WB-40 WB-62 or WB-67 ^b	
Single-lane roundabout (non-traversable central island)	BUS-40	90 ft to 120 ft (27 m to 37 m)
	WB-40	100 ft to 130 ft (30 m to 40 m)
Multilane roundabout (2 lanes circulating) ^f	WB-62 or WB-67	120 ft to 180 ft (37 m to 55 m)
	WB-40	135 ft to 160 ft (41 m to 49 m)
Multilane roundabout (3 lanes circulating) ^f	WB-62 or WB-67	140 ft to 180 ft (43 m to 55 m)
	WB-62 or WB-67	190 ft to 240 ft (58 m to 73 m)



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Roundabouts: Accommodating OS/OW

➤ Truck Example: Granite Falls Alternate Route

- Single-lane roundabout (150' ICD) on a state route in Washington state
- New facility truck route (bypassing a local small town)
- 112' long OSOW truck making a U-turn

https://vimeo.com/188731661?embedded=true&source=video_title&owner=54086178



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Next Steps and Take-Aways

- Well-designed, successful innovative intersections will benefit all users
- The RAID team is looking for ways to partner:
 - Outreach
 - Education
 - Improve designs

See an exponential increase in implementation of roundabouts and alternative intersections
 See a corresponding decrease in intersection-related fatalities

→ Why Alternative Intersections?
Reduced number and severity of conflict points = *Reduced fatal and serious injury crashes*



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Questions?



Contact: innovative.intersections@txdot.gov

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Presentations



Union Pacific: Houston Milestones, Recent Achievements, and Future Innovations

- Tyson Moeller, President of Texas City Port & Terminal Railway Company, and Union Pacific

Announcements

Upcoming Meetings

- Future GHFC Meetings - October 17, 2024
- Regional Air Quality Committee – July 25, 2024
- Transportation Policy Council – July 26, 2024
- Transportation Advisory Committee – August 15, 2024
- Safety Committee – August 27, 2024
- Texas Freight Advisory Committee Meeting - Fort Worth Area – July 24, 2024

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