Crash Analysis Studio – Session 10 Transcript

Introductory Trailer

Chuck Marohn: I want to give you two scenarios. Scenario number one a plane crashes. Scenario number two, two cars collide. In scenario number one, we pull out all the stops – we bring in the NTSB, we try to figure out exactly what went wrong. Scenario number two – we send out the cops, we sweep up the mess, and we go on our way.

John Pattison: If we, collectively – everyone on this call and the broader Strong Towns movement – if we do this right, we're going to save thousands of lives.

Edward Erfurt: Mayors and local council members want to do the right thing. They have the ability to solve it. We're going to help provide those tools for them.

Session

Tony Harris: All right, I see that we have attendees filing in slowly here, but I'm going to go ahead and get us started. So, hello everyone. Welcome to the Strong Towns Crash Analysis studio. We are glad that you're here. My name is Tony Harris and I'm the Action Team coordinator at Strong Towns and in a moment, I will introduce you to the rest of our expert panel. But first I'd like to talk about why we're here today.

Last year over 40,000 people died in automobile crashes in the United States alone. Hundreds of thousands more suffered traumatic injuries and despite the best efforts of public safety officials, these numbers have been increasing and they affect all our lives. There is a prevalent misconception that car crashes are caused solely by the mistakes the drivers make. Looking at your phone, changing the radio, drinking alcohol, speeding. When a crash occurs, the North American response is to send out law enforcement and insurance agencies to a sign blame. We ask questions like, "Who made them a sake that caused this crash?" and "Who should we blame?"

The reality is that crashes are caused by multiple factors, not just driver error. When a traumatic crash occurs, we need to identify all the contributing factors and learn all we can so that we can reduce the number of traumatic injuries and deaths in our communities. So, what you're going to see now is a Crash Analysis Studio. Drawing from the best practices of the medical profession, we've convened a panel to review a crash that happened in Huntsville, Alabama. During this crash, a driver struck a cyclist at a busy intersection and the cyclist lost their life at the scene of the collision. So today I'll start by introducing you to our panel, then review the facts of the crash and with our guests we'll assess the design factors that contributed to the collision. Our goal is not to assign blame. Our objective is to learn as much as possible about what happened and identify the many factors that contributed to this unfortunate event.

So, before we get into the details and speak with our experts, we need to begin with the fact that this tragedy resulted in the death of Joshua Gurley. Please take a moment of silence with me to honor and acknowledge him and the loss of his life. Thank you.

So, I'm now going to introduce our expert panel for today. First we have Melany Allison. Melany is Toole Design's Civil Engineering Practice Director, based in Pittsburgh, PA. Melany is a project manager and civil engineer with more than three decades of experience in civil infrastructure projects, primarily in the northeastern United States. Her experience includes working with state departments of transportation, local governments, developers, and metropolitan planning organizations. She guides the design of safer, people-centered streets in a wide variety of contexts. Melany holds a Master of Science in Civil and Infrastructure Engineering from George Mason University. This is Melany's second studio with us as a civil engineering expert. Welcome, Melany!

And then next up we have Ben Payment. Ben is a native originally from South Huntsville who moved away for college and a couple jobs before returning over 10 years ago and has been

advocating for bicycles and bicycle infrastructure in Huntsville ever since. He's been a member of the Huntsville Bicycle Advisory and Safety Committee since 2016; he is a co-founder and board member of the Huntsville Urban Bike Share Co-op. and past board member to the Land Trust of North Alabama who has partnered with the City of Huntsville to build greenways and green links. Ben is also the founder of the very-popular, slow-cycle, group Bikes & Brews which encourages cycling downtown through group rides to fun coffee shops and breweries.

And then next we have Dario Gonzalez who is a traffic engineer living in Huntsville and working on projects throughout Alabama and nearby states. His work encompasses many tasks related to sustainable infrastructure design, roadway safety and the efficient movement of goods and people. He advocates for greater accessibility, safe travel for pedestrians and bicyclists and wants his girls to be able to explore the city by bicycle.

And then finally we have Edward Erfurt. Edward is the Director of Community Action at Strong Towns. He's a trained architect and urban designer with over 20 years of public sector and private sector experience. And Edward has a skilled eye when it comes to evaluating the safety issues posed by intersections roads and streets like the ones that we will be looking at today.

So now I'm going to walk us through the details of this crash in Huntsville. I'm just going to share my screen. Okay, perfect. So I would like to start with what we know. Can everybody see the PowerPoint that I've shared?
Melany Alliston: Yes, we've got it. Thank you.

Tony Harris: Great. Thank you. So we know that Joshua Gurley, who was 37 at the time, was cycling across University Drive. He was going southbound toward Julia Street when he was struck by westbound vehicle in the intersection. The crash occurred at 4:41 pm on June 7, 2021. And as we said, Gurley died on the scene shortly thereafter. We know that it was a hot day with scattered clouds, but no rain in Huntsville. So our nominator Larry Mason, he confirmed that the speed limit on University Drive is 45 miles per hour. As we said, the motorist was headed

west on University approaching Julia street when they hit Gurley. Now the crash report states that Gurley failed to obey traffic signs or signals at the time of the collision. And that there was no evidence to support filing charges when the crash happened.

So here you can see a map with the crash location marked by the red pin. And then what we've done here is we've zoomed in to show a close-up on the intersection. I've illustrated Gurley's alleged path of travel in yellow, as you can see up there. And then the motorist is depicted in orange in that lane and we've outlined the crash location in red.

So based on the diagram and the crash report, we believe that Gurley was traveling from near the Economy Inn parking lot. And that he made a diagonal cross toward the east side of the intersection where he was hit. It looks like in the diagram that he was hit in the lane closest to the center turn lane, though this was not confirmed. I do want to emphasize that in the report, it stated that the motorist was unable to react in time to Gurley passing in front of the vehicle. And from what I was able to gather from the report, no impairment tests were conducted.

So, when we look at the site conditions, we see the University Drive has seven lanes total. Six of them are through traffic lanes, so three are eastbound and three are westbound. And then the center lane is dedicated to left turns in both directions at this particular intersection. Now we also see that all four legs of the intersection are signalized. And there's one marked crosswalk on the west side of the intersection that goes across the University Drive. So our nominator Larry and some of his colleagues pulled together some visuals for us that I want to kind of walk us through briefly.

This first one here is the west side of University where we believe that Joshua's diagonal cross toward the east side began. And this next photo is from the east side of University. The crash would have taken place in one of the westbound lanes on the far right hand side here that's closer to Olive Garden. And I went ahead and outlined that in red.

And then in the interest of making sure we're clear on the collision location. We're going to look at these next two photos. So on this slide, we are looking directly at the westbound lanes where the crash would have occurred. Our vantage point is from the south side of the intersection looking north. And then in this photo, the opposite is true. So our vantage point is looking south at Julia Street and we'd be looking at the lanes where the collision occurred here.

And then next we have a shot kind of looking west across University Drive. So this would have been nearby where the motorist would have been located coming into the intersection. And I also wanted to note you can see the pedestrian push button for crossing here. And this next photo we've included to illustrate what the west side of the intersection looks like where that one crosswalk is. And this photo, our vantage point, we're standing north and we're looking south. And crossing here takes you into a grassy area on the other side as opposed to a sidewalk or a refuge area. Now this next photo here is a still image that I pulled from a video Larry submitted for us. I just wanted to point out that even though we're looking at an area that's a little bit east of the crash location, we can see that there's a pedestrian crossing university, amidst traffic with no crosswalk. And next I want to look at the dimensions of the intersection. So we see on the right hand side here the six through traffic lanes. Each of them were recorded to be 12 feet wide and the center turn lane is indicated to be 16 feet wide. So this makes the distance across those lanes 88 feet. And then Larry our nominator also noted that the sidewalks were four feet wide at the time of information-gathering. So looking at the full intersection, we see those four foot sidewalks and then also five foot planters on either side of the lanes that are illustrated here. So that extends the full width to 106 feet.

A little bit more on site conditions. We're looking at kind of a suburban development pattern here with a mixture of property types. And that is primarily residential and commercial. There's proximity to state routes 53 and 431 as well as highway 565. The University of Alabama in Huntsville is nearby as is the Clearview Cancer Institute medical complex. apartment buildings and communities as well as numerous hotels and inns. So I'm going to move us over to the map of the surrounding area. Just zoomed out a little bit to illustrate a few of those things that I just

spoke about. Of course you can see these major roadways are in yellow. And I did want to note that housing and land uses kind of along this corridor are linked to and interact with the university to some extent.

And then another note about infrastructure modifications. There have been some infrastructure modifications at this site between November 2020 and November 2022. Though to my knowledge the roadway has remained unchanged from what we've depicted in this presentation. So the Eastbound bus stop and shelter that were on the southeast corner of university in Julia they've been removed during this time span. Also during this time span a pedestrian curb ramp with tactile paths was added on the north side of the East crossing. And we know that the City Public Works Department would have been charged as responsible for the shelter and ramp modifications.

And Larry and some of our colleagues here managed to pull together a speed study for us. They conducted the study during weekday afternoon hours with clear weather. So those would be under conditions that were fairly similar to when the crash occurred. And we found that on University Drive, 61% of the 543 cars tracked were traveling over the 45 mile per hour speed limit. 4% of drivers were traveling at 55 miles per hour or more. And then according to our calculations we found that 85% of drivers were traveling at or below 52 miles per hour. So, I'm going to stop sharing here. And I'd like to turn to our panel now if we could. Melany if we could start with you just kind of based on the information we've gone over today and what you've read up until this point. What contributing factors do you see at work here? And again, if you have Google Street view up and available feel free to screen share if there's anything you'd like to point out.

Melany Alliston: Yeah, I'm going to actually go ahead and do that. I want to kind of step back a little bit and step back from the intersection. So I have marked in Google Earth here. Can you also see my screen? The Eastbound and Westbound stopping site distance. So the spot where a driver would need to Be able to see somebody in the crosswalk. Be able to see the traffic light

when they're approaching that intersection. And so this for 45 mile an hour posted speed it is 360 feet back from the stop bar. I would also note that the traffic light that the driver in this particular case was using is an additional 120 feet to the west of the stop bar. So the driver actually needs to be able to tell that light is red or green is red to stop about 480 feet from the actual stop bar. So I just want to drop into that kind of stopping site distance spot here and I'll apologize for the sea sickness. Here's we scroll around but you can see it's really hard to see that traffic signal. Also keep in mind that the time of day that this would happen would happen the sun would have been shining from west to east. And so it would be backlighting that traffic signal making it even harder to see. And what you see here if you can see where my pointer is, that's the bus stop on the right there. There's actually a pedestrian at that bus stop right now in this view. And you know you can see how very hard it is to see them. And so it would be difficult to see them starting across the street from that far back. I want to then just drop in quickly to a point that's half of the stopping site distance. And again, look at that bus stop. The near crosswalk is where that first black car is kind of in the middle. And the the far crosswalk is up under the traffic signal light. You cannot discern the crosswalk stripe thing. So on there again, that pedestrian is still standing up at the bus stop there and is very hard to see in this view.

And so you know, understanding site distances and improving visibility. I think visibility with all this roadside clutter with signs and wires and poles is one of the contributing factors. You know, if the prevailing speed of traffic was higher, that stopping site distance needs to be even further back. And so I think that's kind of a big contributor to this. The other thing that I wanted to point out. I don't turn this back around, but you know, we talked a little bit about the cyclist making kind of a diagonal maneuver across the intersection. Well, if you think about a cyclist that's coming west to east along through here. And that cyclist knows that there's no refuge for them on the south side of the intersection here. Of course, they're going to go across, you know, toward the east side. Because there's no place for them to get out of traffic once that light turns green. There's no place. Even when the light has turn green on the side street, they're in the path of turning vehicles. And so there's no refuge there. And there's no refuge in

the middle of the road. I know that there's a short stretch of curb in here. But it's not wide enough to qualify as ADA compliant refuge for someone to stop in the middle and take another look around. The other thing to think about zooming out from east to west, sight distance points in this intersection is approaching this intersection. There's 10 driveways. This short segment of curb on the west side prevents left turning there. But there's nothing preventing left turns from those driveways. So there's an awful lot of stuff going on around this intersection for that driver to take in. And as you can see too from the condition of the flex posts that were on that curb, that wherever there's a driveway, the flex posts are gone, meaning that people are probably, you know, still using that space to turn left anyway, and driving right over that curb. So, you know, those are some of the things that I noticed.

The other thing with pedestrian push buttons too, they're on the back sides of the poles. They're not reachable from the landings of the curb ramps as they should be. And so, you know, chances are that cyclists probably did not use that push button before they went across. And similarly, pedestrians, if they can't find it, they're not going to use it. And, you know, the push buttons also serve sight impaired pedestrians who can't find it. So, so that's my two cents.

Tony Harris: Great. Thank you. Yeah. The, um, the lines of sight and stopping distance - just some stuff is always very interesting to me, to take into account as you're thinking about the different, the different parties involved in the crash. Great. Ben, would you like to go next?

Ben Payment: Yeah, sure. I, um, I really appreciate Melany's insight and I hadn't considered the stopping distance, but I think she really hit on a particular sailing point, which is the setting sun being a large contributing factor, you know, given that at 4:30 this time of year or the sun is getting quite low in the sky in the central time zone on the eastern edge of the central time zone. And so, I'm sure that that added to the to the chaos of the scene. I also, as you were introducing it Tony, wanted to note that this is a US highway in and of itself. So, this is US highway 72. I don't think that came across. So, it is, you know, a hoard or that has federal old dollars and state dollars and stuff that have, you know, co-mingled and then of course, those

dollars usually have funding restrictions attached to them, which is probably why some of those improvements, and I'm going to share my screen, kind of talk through some of the changes and talk about where they came from as I understand.

And so, if you guys are seeing my screen now, this is the Google Street view and historically, right, you can look at the bottom and see that we're looking at April of 2019, then by October of 2021, if you guys recall, the crash was in, maybe I have that wrong, but the crash was in October, not in October of 2021, but it was in mid-21. So, I guess my sightlines on the sun are a little different, but it's still very, very germane to talk about how those sightlines impact and the setting sun or at least low in the sky, really do impact your eyes. But in 2019, the state came through and added several of these curbs along the center of University Drive and then a lot more actually half a mile to the west and even a mile last, and they worked to close off several of the intersections, right, so you're looking at the closer here in the background, several of the driveway and entrance is so, so I think that that points to the fact that the state recognized that this was a problem area, right, there are literally just too many conflict points, right, so the state was already trying to address some of those things, but as I looked at it and back out, I'm going to pull back to, I'm not as savvy at driving the tools as Melany was, but if we look back and look at some of these entrances, there's a lot more they could have done, and I don't know who makes the call what entrances need to be at close, this is the one that I was showing you guys just recently in the other view, but there are plenty of other candidates where, why do we need both of these two? Why did only this one get closed and several of these other redundant driveways passed stay open, especially here on Julia Street at the incident? Why does this business need both the primary and arterial access points, right? So why weren't more of those removed? And who was doing that analysis?

So I think that that's another great point that Melany had on is there's just too many conflict points, and then of course the cyclist that she mentioned going east to west, there's no sidewalk infrastructure at all on the south side of the road, as I understand it, this was actually a city employee and was going to work, so they were actually trying to commute to work, don't

know exactly where they're coming from, perhaps some of the long-term hotels stays in the area, but there is a overarching problem with infrastructure where this is a Huntsville GIS database, which is really nice, and it shows, I've got turned on the bike routes, speed limits, and land use by zone, but what I think it really shows is the lack of east-west corridor, right? Everything in terms of these neighborhoods sort of funnel onto Highway 72, and there aren't connections east-west through these communities particularly well, and so what you're doing is you're forcing all the modes of transportation to this main highway infrastructure and as we saw in the other screen, right? There's not a place for pedestrians and bicycles, right? And so you're forcing all users to use really infrastructure that it's designed for cars, and that ultimately is the problem, right? It is a very car-centric piece of infrastructure, and it's not serving all of the needs and all the people there. So I guess those are a couple of big thoughts that I had.

Tony Harris: That's great, that's really helpful. I appreciate that you highlighted some of the historical work that's been done and then also pointed to, you know, there's so these redundant driveways or exits or entrances that was really helpful for me to understand and looking at the east-west connections to, and the corridor. Thank you. Dario, would you like to go next?

Dario Gonzalez: Yeah. Okay, so I'm going to try to share this screen also. I may fail in doing this… but then, yeah. So I think you can probably see that.

Tony Harris: Yeah, I can see it.

Dario Gonzalez: Okay, so I wanted to talk about a couple of things. First of all, yeah, Ben's right, that there is no sidewalk on the southern side, I guess, western and southern side of US 72, which is also called University Boulevard. So that explains the diagonal path. There's no reason for someone to try to bicycle over here when they have to get over that curb and then ride on, I guess, the grass there, you know, and you know, hop over these curbs wherever they're going. So that does explain that diagonal path. The other thing I wanted to show is that this is, this is

seven lanes here. So you can, this is between 90 and about 90 feet, you know, that a person would have to cross. With the pedestrian signal, I think it set to about 26 or 23 seconds, which is pretty good, but as Melany pointed out, there's a photo, this sign here, which I guess is regulated by MUTCD and the size of it, is not really very visible. So if you're from a loyalty intersection and you walk it, you know, and you realize, I mean, once you realize that there's a push button available, therefore you, you can hit it, sure. But as you're first approaching coming down this way, it's pretty unlikely that you're likely going to notice that there's a push button signal available for you as a pedestrian. It just doesn't, it just doesn't make any sense. I mean, it's fairly easy to increase signage, but then that does also add to the clutter and the visibility issues for drivers. But honestly, I think drivers should just be moving probably a little bit more slowly, especially since you do have the many accesses really all the way to place. Just as Ben said, there's no reason. I mean, this really cries out for access control here and here in all of the place.

One other thing that we haven't talked about is the future of this corridor, where the Hunsville is pushing forward with bus rapid transit on this corridor. And one of the reasons is because this corridor here, besides having residences back here and over here, it's also connecting the downtown area with a lot of other residential stuff going on over here. So bus rapid transit is coming to this corridor. And I'm not sure how that's going to shake out. I like the idea of more buses here because I think vehicles will have to slow down because they're going to have less throughways, for themselves, for their cars. But I'm not sure that the city is going to embrace that or it's going to fight that, honestly. And I'm not sure about the spacing of their bus stops. I don't know if a bus stop will be placed here again. I think it's currently over here. I'm really glad to hear that over here. I don't know if the city is going to promote more bus stops or fewer since the buses are really meant to operate as an express bus as I imagine. But I would like that to be used to somehow slow down this traffic even though it's just going to be really for the peak hours. I don't, I'd like to see this corridor narrow a little bit. If there are going to be buses on the corridor, maybe those could be used to narrow the corridor itself in some way.

Tony Harris: Great. Thank you. That's really helpful to be thinking about buses and transit as it moves through this area in this corridor in particular. Yeah. Yeah. Okay. Edward, would you like to share with us anything about factors? I think you're on mute still.

Edward Erfurt: Yeah. I really appreciate it. Melany's perspective from the car and what you would see from that car experience and understanding the distance and what the sight lines would be and the choices of driver would be making on this road. The design clearly with the multiple lanes, the number of lanes here are equal or greater than most of the federal highways, the interstate traffic that's running through the community. So we can see the environment here, the only thing that really is slowing drivers down is that anybody making that right turn in or out of any of those drivers along the corridor.

If I'm a pedestrian or cyclist coming to this intersection, there's some interesting things that I noticed that would contribute to why somebody would cross it in the area that isn't designated for them. As we come to the intersection, you can't see the sidewalk here because of drainage. You have to actually go out of your way uphill and across this cross slope. If I was a cyclist, I would or even a pedestrian, I would probably step over this if I was able. And if I look at the time of right around that crash, we would see this as the conditions are. Again, if I'm a cyclist on the side of the street, on the sidewalk, I'm not given the opportunity to actually ramp off of the street. So I'm going to come up and around and out and probably at that point look at diagonally across the intersection. Or I'm going to come to this next driveway. And there's not where the cross walk is at the time. There was no ramping there and I would probably likely make the decision to go diagonally across the street headed to where at the time was a bus stop. And if I even went a little bit further, you could see that there's even yet another driveway that's done in the cross walk that would get me out to that point. So the conditions here, there's nothing in here with all these driveways from a cyclist perspective that would lead me in as a pedestrian, I would be looking at those alternate routes.

I know that there are contributing factors here, that we can see that there's been work done. We should acknowledge that. But again, the way these connect in, it's in such isolation, it's not even fully complete. So I'm not going to speak to where the push button needs to be at the signage for it, other than the fact that you can't get to the push button. So work has been done to improve this crossing here. One, I can't get to it. And then even if I'm here unless I'm coming by bus, there's nowhere to go that is a receiver for that. So when we're looking at these, these roadways really understand the experience of the, all the users coming to this intersection. And because the road is so wide and we've seen this in many crashes, as adults, we would make decisions. We're always calculating that the timing. I'm not sure how long it would take for this to switch to allow for pedestrian crossing. If I didn't know the push button was there. So this was the intersection that was something that required an action to get the reaction for the crossing. And this is an intersection I would be traveling in many times. If that walk is naturally going to turn over, it would be familiar for me to cross this regardless of the pedestrian signaling. I would be looking for a break in traffic where I could get across this street. There's just as we talked about the drivers coming down with all of these driveways, the cyclists and pedestrian also have many, many choices and lots of influences that there's clutter, and noise that impacts making a fully informed decision. The number of driveways that are located here, some are actually worse than others. When we're looking at these various improvements, right here at the Olive Garden, the two of these and even looking at where the society, if somebody is taking a right turn out of here, how dangerous that would be and how they might and even see the traffic light, they would be exiting the Olive Garden with no acknowledgement. No way to actually see what the light is at that location.

Again, all of these locations are places that pedestrians and cyclists have to cross. And the sooner that I could get across this, whatever I felt comfortable with, I would. And looking at the analysis that Melany showed us, that the stopping distance from a car so far away, if a car is going to faster than the posted limit to travel or what I'm familiar with, and my experience is a cyclist or as a pedestrian crossing the street, I would have a hard time judging that. I may also have a hard time seeing them. If there were two or three cars in the other lanes, from what we

can tell from the police report, the driver in the car that hit the cyclist was in the center most lane. If we think about the time and distance and visibility, the cyclist making decisions here, the vastness of the road, if there was a car that was in the curbling or in the middle lane, I may not see a faster car that is approaching. And again, it would impact my judgment where I would feel confident going across a street where I may do it all the time, regardless of what the light changes. I've been patterned to do that because I didn't know there was a button to press to turn the pedestrian signal on. And after being an intersection like this that failed to switch, I would go through two or three light cycles and not see a pedestrian crossing. I would probably just get in habit of saying it's broken and I'm going to draw an diamond and get across the street. So there's a lot of conditions with this.

In addition to what the others have described of, they're really wide and excessive lanes - and not having the crosswalks complete in this intersection. So yes, we've put striping around three of the sides. We have three different sides in which you physically can get around as a pedestrian safely. Even with where we can see that work has been done more recently to address some of that. It's still as yet to be complete. Actually, probably making it worse because we're in current and now we're at any more encouragement for people to cross. And as a driver, if I'm not seeing the light, I don't even have, there's no chance for a pedestrian at this location, which is probably why if you look at the Google Street Views and based off of the nominators, while you see people doing midblock crossings without looking at the light, that also tells me that there's not enough traffic on this road to warrant all the lanes. Because if there was really that much traffic going on this corridor to fill three lanes, plus a dedicated center turn lane, the only hope I would have to cross the street as a pedestrian or a cyclist would be at an area controlled with a full stop. But again, I'm assuming these folks are familiar. They're local. This is their neighborhood. We've talked about the context here. You have businesses, you have a total of, you have apartments. You have places that people ultimately are going to in the start through journey by foot. And then you overlay that with the folks that don't, that journey doesn't include a car trip or that journey includes a bus trip. You're kind of pumping them into this intersection and asking them to survive on their own through it. So I, I,

I, definitely support what the others have identified. And, and you can see how this really is, kind of unsafe for the car and the pedestrian and the cyclist. There's no one individual user of this corridor that it's kind of been pieced meal together, that everybody's disadvantaged and at risk coming along this corridor.

Tony Harris: Great. Thank you. Yeah, it's really helpful to have a breakdown like that when you're thinking about the different conditions that would impact decision-making by a cyclist or by a pedestrian or by a motorist in this area, certainly. Okay. Any other thoughts on factors?

Melany Alliston: Yeah. And I have one more thing too or actually two more things. Also, even if the driver is obeying this speed limit, it only takes five and a half seconds for them to traverse the entire sight distance of 360 feet. I also wanted to share this quick view to in terms of a, not seeing my good worth in my list of things to share here. Just a quick look at sorry. I'll bring this back up, but there's interstate signage. It was found just beyond this intersection by another quarter of a mile. And so the overall character of the visual cues is that this highway, this is a highway connecting two other major highways. And so those giant signs, the green signs are a huge visual cue that this is automobile-only space. And so I just wanted to point that out as well.

Ben Payment: Yeah, I actually had to go back to that. That was a good. I was going to share a screen and point out two things that triggered my thought if I can get my sharing to go again. It being such a car centric space, but you're absolutely right with those signs. And it reminded me that part of the city's GIS database also includes publicly accessible traffic count stations. So I pulled up the one which is not 50 yards from the traffic crash. And we can see the historical traffic counts for the last 20 years is roughly, you know, the low 40,000. And so I don't know road-scape design, but you know, Melany, you may know right off the top of your head. Or you at where whether or not, you know, hey, that warrants a six-lane highway or not. Or if or if indeed, like Dario said that this could actually be a narrower road. And you know, some safety medians or pedestrian islands or something might be a candidate to help with that.

And then another thing that I wanted to point out was, you know, the police officer who gets to the scene, he, you know, his job is sort of the first responder to try and understand what happened. And I don't know if the limitation of tools or time or whatever else, but I personally really struggled to recreate what happened from the diagram, right? We've talked about how this is a seven-lane wide road. And unfortunately what we're depicted with is is a three-lane wide road, you know, in a single direction. And maybe this is the convention, right, that you don't draw the full intersection, but we've made a lot of assumptions based on this diagram and trying to understand what happened that if he had at least drawn, you know, four more lanes there, we would have have more confidence in our inner assertions, but we're, I believe, we're really speculating based on a partially accurate, even not to scale representation of the intersection. And so, like I said, I don't know if that's limitation of tools or time or or diligence by the officer, but maybe there's the opportunity for more training there, right, to ensure that we're capturing whether it's a card a car, a bicycle, a card a pedestrian. I think it's important that the information get captured when it's fresh and people are there because trying to dredge this up two years later, you know, we are making a lot of speculation and, and so having having a better representation, I think it's really important there too.

Melany Alliston: Yeah, and then to answer your question, I actually went out and found the traffic data too. There was a year newer 22, which shows a 10% drop from 21, and you saw kind of in the trend, it's been actually dropping, it's down about 36,000 ADT right now, but in terms of, does it need a 6-lane highway? That number is kind of borderline based on, you know, general engineering rules of thumb. It could be four, it could be six, six is with, you know, the level of traffic dropping is probably more than it needs today.

Edward Erfurt: Yeah, on things like that, you also can design the road for the character and trips that you want to have. So what want to approach a conventional approach is to say, we're going to do the belts and suspenders and add advanced capacity, and what we find is traffic is like a gas, it will fill whatever space you provide it. If this was a four lane road or a smaller

roadway section, yeah, so people might have to go slower, they may lose two seconds on the trip, they may have to wait as people turn into one of these locations, but the traffic in the patterns would adapt to that. People would know, okay, at five o'clock, I'm not going to do my extra trip on that road or on the on a football day. This is not the, if I'm local, I'm not - that's not the road I'm going to be on. I'm going to let the capacity go out to the visitors and town and deal with the before and after a game traffic. There, Ryan makes sense, prioritizing potentially the local traffic as opposed to the through traffic when, you know, the major parallel artery there to Highway 72 is is interstate 565, right, for the big through traffic, right, let's let's put those all where the pedestrians and bikes aren't allowed to be and prioritize all the residents that live in that area and the neighborhoods that feed that area and not necessarily the people that are trying to drive through at 60 miles an hour to get across town.

And the interconnectivity that when you look at all these different driveways, like Olive Garden having to some of the hotels up to some of the murky that from a zoning side, I see that something that always infuriates me when to commercial uses or next to each other, but if the gas station and the auto part store are in two different zoning categories, then a buffer's required, so now there's a six foot fence as a pedestrian that's going to keep me from those properties. When you look along the corridor, there's probably three quarters of the corridor that is already interconnected, but it's one one parcel or two parcel shy of this intersection. And when we think about it was brought up earlier as some of the interconnectivity, simple and interconnectivity from a hotel to a restaurant. Even for some reason, you can't get the car connection providing that parallel pedestrian route, so people don't have to get in their car and they have that option.

All of those little things contribute to lowering the demands and what has been described as a conflict, so people coming on and off this corridor, any of those things are highly helpful. And it looks like along the corridor, there's places they've been closed and that most of the engineering departments have, when they want to be, they can be quite assertive. When they want to close something off, they can, and I think that like at the Olive Garden, where there's

two, the state is giving them a traffic light. They're the only restaurant on the a mile stretch that have the traffic light. That's a good negotiation to say, well, we're providing you this above and beyond condition, that extra one you have to the east. We want we're going to close that. We'll pay to have it close. You'll yield out to new parking spots in your parking lot, but that'll be safer that it'll accommodate that. And again, when they're looking, when when I've worked at the municipal level and there's an engineering component, getting the land use connected with that is really critical and having that conversation, if it only will not happen if we don't ask. So getting there and talking to property owners is really critical.

Yeah, I also wanted to just go back and touch briefly Ben and Dario. You both mentioned kind of the width of the roadway, but there is ample space within the existing roadway without even reducing the number of lanes to put some pedestrian refuge in the middle. That center turn lane is 15 or 16 feet wide. The travel lanes could go down to 11 feet or even 10 feet with an 11 foot outside lane for the transit and you could have a six or seven foot wide pedestrian refuge at the center of that roadway as well, which would then also serve to make drivers a little more gotten comfortable and slow them down perhaps. So. Well, I think Tony, we should go around. We've talked about a lot of the contributing factors.

Tony Harris: Yeah, I think we kind of hit a natural segue even into recommendations for how we might want to change up this intersection to be to be safer and prevent future crashes. Melany, could we continue to roll with you on recommendations maybe kind of like short term, near term, long term?

Melany Alliston: Um sure. I mean, I think this one is kind of relatively not great for very short term recommendations, but I think some of the less expensive intermediate term recommendations like adding pedestrian refuge at the middle, you know, put a receiving curb ramp on that west crosswalk, put the push buttons in places where there are ADA compliant 18 inches from the landings on the curb ramps, make sure all the curb ramps on those big commercial driveways have the truncated domes. There's a lot of little things that could be

done to improve this. Also considering, you know, you had leading pedestrian interval on the side street, but you didn't have it on the main street. So, can we put it on the main street? Looking at the crossing distance versus the crossing time, it's can we lower the crossing speed to two and a half feet per second instead of two and three quarters? You know, there's a lot of different operational things that can be done. I also have some concerns for this intersection at night. This is a seven-lane highway with lighting only on one side. The position of the streetlights should be such that they front light the crosswalk so that the streetlight is between the approaching driver and the person in the crosswalk. You know, just like taking a photo of somebody and who's backed by a sunny window, you get the giant halo, but you can't see the features. Streetlights are the same way. So, we want in front of the pedestrian between the driver and the pedestrian and we want them at both ends of the crosswalk. Not just one 85 feet away.

So, there's a lot of kind of intermediate term, but the other thing is, you look like all those business signs can we back them up? Can we, you know, take away some of those things that are very close to the side of the roadway? Can we not have the bus stop bus shelter? Where a stopped bus would block the view of somebody getting off the bus and getting into that crosswalk. Thereby potentially causing a multiple threat crash scenario, put the crosswalk behind where the bus stop is. So put the bus stop on the far side. So, there's a lot of things.

Tony Harris: Great. Great. Thank you. Maybe Dario, would you like to go next in terms of recommendations or thoughts on how we might be able to change this place up? I think you, you're on mute.

Dario Gonzalez: Thanks, Tony. I'm going to share this screen again. This is show something here. BASC, the bicycle advisory and safety committee. Did a crash analysis, not just of university, but of Huntsville. And we looked at all sorts of crashes, really focusing on pedestrian and bicyclists. And you can see here, this is just one of the many slides. Of 360 crashes over a, I think it was a nine-year period. Most of them were on University Drive. This is listed

alphabetically. That's where it comes down at the bottom. These are the pedestrians, and I can show you the bicyclists are similar. I mean, the number is far fewer to the bicyclists. But University Drive is one of the worst gents to bicycle or walk. So in the short term, what I think should be done is, I mean, simply build a sidewalk. Huntsville has a very poor network of sidewalks, let me just say. Essentially, if a road has one sidewalk, everybody moves on thinking that that's the tradition. But it's not sufficient. There are plenty of businesses here, and plenty of people living just behind, and we didn't build the one way of road, because everybody wants to get to each of these places. We should find. Build a sidewalk. It's easy. I know everybody cries about the money but building one sidewalk costs far less than adding an additional lane of traffic. In the longer term, Huntsville should look at this seriously along with the fence and say, oh, there are many crashes here for people bicycling and walking. What don't we make these greenways and cut down the number of accesses here? Just one very wide shared use facility can really cope. People moving back and forth and get people off the road. I'm sure there are people bicycling right on, and you're certain. I've seen them sometimes. It's difficult and it's very risky.

So doing that would really help in the long term, and getting serious about where people are going to cross things like. It's pretty straightforward. Let's look into it. There's plenty of federal money for this sort of thing.

Tony Harris: Great. Thank you. Definitely building in a sidewalk, and I think some more options to support pedestrians and cyclists in particular. Ben, anything from you?

Ben Payment: Yeah. I think Melany and Dario summed things pretty well. I'll just expand a little bit and say, of course, adding sidewalks in the near term is important. But another potential near term that Melany hit on, and I briefly touched on was the larger connectivity. This is a huge residential neighborhood. This is another residential neighborhood, and this is an apartment complex. They don't connect. They barely connect to the businesses. That's an easy fix. When you're closing down some of the driveways, open up the pedestrian and the bicycle

connection between these communities. If you're in this area and you want to go to the east, you're only option is to get on this road. And or go incredibly far around. I think in general, forcing that connection across zones is really important. That one's not terribly hard to do. That's tearing a fence down and putting five feet of sidewalk to connect between things. What that looks like on here is, you've got this road. It just adds in right here. And there's almost a connection, an asphalt connection that's not on the road to the intersection. But it doesn't take much. And cyclists and pedestrians both. If given the option to be anywhere else, but on the road, they'll do that, right? Because they know how dangerous those roads are. And so, so opening those corridors, I think it's moving through and enabling those alternate connections for the mixed use is really important and fairly easily achieved.

Tony Harris: Great. Thank you. Yeah, I know in an earlier crash session we did this year. We talked about opening up some connections in between different neighborhoods that were having a similar issue. Ed, any recommendations from you?

Edward Erfurt: Yeah. The very first thing I would do is get city staff out there tomorrow. The city's spending a lot of money it appears on reworking the intersection from the pedestrian side. So, they're putting ADA ramps in. They've got we can look over time and we can see that they've striped the crosswalk differently at this location. So they did kind of the piano keys versus the two bar lines. The engineering staff at the city and the folks doing the construction work need to get out there and look at this because there's a lot of wrong and they're actually investing money on this.

I'm always alerted when I look at it intersection and I see the pedestrian paths are diagonal that always leads me to there's - I'm always concerned with that. In one of the pictures that our nominator shared you can see in this ramp there are big tire marks that went across this ramp. The reason these are angled is because the geometries of the intersections have been scabbed together and these large curb radii are resulting in a really wide intersection. So as we've talked about the stopping distances and visibility concentrating where people are and making more

awareness of it there. So after getting staff out there the very next thing is to get out there and restripe they have to go for narrower lanes try to get even if you have to drop the turn lane to go and accommodate that over for pedestrian refuge. There's plenty of room there to do it with some paint but even on these all of these intersections getting all of these radii much tighter getting this all kind of straightened up so that you have those platform components to it putting in as as much visible cue that you can for drivers and making it feel as comfortable as possible for the pedestrian and cyclists.

So this starts with the paint, the bollards getting all of that in place. If the crosswalks - you may need to go with a higher visibility crosswalk and include more reflectors in it. To get that awareness that this is where it's going to go it's a thousand feet to the east to the next pedestrian crossing and it's two thousand feet to the west. So if you're going if you really want pedestrians to be using this elevate those pieces so those paints and bollards. I totally support the idea of focusing, if not reducing, the number of lanes, reducing the size of the lanes, right-size them so because we know that people are going to fast today on the street and by narrowing those lanes we could re-allocate that to a center median that would actually be have some depth to it that could have some vertical elements and then also provide an intersection like this a true refuge for pedestrian to get across.

When it comes to the sidewalk components there's a sidewalk on the north side of the street and then only a partial one to the south. Depending clearly clearly there's horrific things happening along this corridor with the number of pedestrians and cyclists that have been hit along here that costs if we talk about cost-to-side blocks sometimes the cost for a wider asphalt path is the same as the six foot or five foot concrete path and getting that on the grounds providing a wider more comfortable pedestrian or cyclist environment on the north or south side of the street so it's not just that five foot sidewalk putting that in and finally like everyone else but Dario and Ben talked about going along and being selective many of these drive like curb cuts could be closed tomorrow with a couple barriers and looking at that and working along this corridor we have to take safety as a priority. Business owners will have their

complaints about this I assure you people will find their businesses but there's a safety issue with this it's really looking at those pieces and in the cost it's such a nominal cost to put basically a bobcat to take out some curbing and then some quick asphalt could get some interconnectivity in place it's really important to connect that land use component to it. Those are the things to accommodate the users that are out there today, right.

Longer term the city really needs to decide whether this goes for fully automobile auto-centric environment where you remove the pedestrian and cyclists out of it, which also means you remove the busing component that would bring those to this corridor and you do what we see. It becomes a more of a limited access highway. Or, you step back and say look we have we are adjacent to a lot of businesses with the opportunity for development we have lots of residents here that need to be able to move through the corridor both by bicycle, foot and car and bus and if we're going to do that we need to think about that approach first and accommodate all of those users within this public right of way. there's plenty this is a really wide section there's plenty of things that can be done to accommodate all those individuals safely along here that would be in an environment that would be safe for all of them so there's there's a big policy discussion that has to happen do we go make this a highway and limit all the access to it and remove users or do we make it available for all users within the city of Huntsville to utilize this corridor and by doing that we're going to make sure all users are safe while using this corridor

Melany Alliston: Yeah and and the one quick and easy thing they could do although it won't be easy if you talk, have to talk to state or highway to do it, but lower the speed limit.

Ben Payment: That's a really it's a really good point and I was thinking about it a bunch as you were talking to Ed and Melany it's historically when I have approached the city about concerns and areas particularly in regards to state highways - I mean this is a federal highway what the states the one who sort of implements it - is that the city has given me the the shoulder shrug and said, "well that's that that's a state highway it's not our jurisdiction".

And so while I think that the bus shelters are the city's I think almost everything else that we've talked about in terms of improvement and changes has been at the state level and from my past experience dealing with the city they seem to have trouble necessarily getting on the same page with the state on some of these projects and like you said you know the olive garden right they just repaved a curb cut and I believe that was the state in the city but you know is that necessarily in line with the city's plan and the city's desire. I personally think that there may be a bit of a disconnect there and that the lines of communication need to be strengthened especially when it comes to multimodal transportation planning.

Melany Alliston: And is it a preconceived notion you know that oh the state will never buy this so we're not even going to ask and so we want to make sure that that they are asking.

Edward Erfurt: The other thing I want to point out too under the new PROWAG money is no longer a reason that you can not make things compliant so I'm not sure whether that's going to have a chilling effect on doing you know pedestrian and bicyclist safety projects or we'll make them better but that that remains to be seen well and let me speak to the city state federal that whole quandry - I worked in city government and I worked in county government where we've had these issues I have yet to find a state agency that is not willing to take - to allow a city to do interventions on roadways to actually do the work. The excuse, normally at the state level, is that their engineers whether it's an outside engineer or in-house engineers are so busy doing other stuff, can't do a review of this intersection or even to come out and look at it they don't have the time to do it. But at the city level they also have engineers and a couple of sketches and I and I can speak to this because I've done this with Melany she was a consultant I had.

Working in a municipal government, very quickly I could talk to my city engineer she would draw some ideas of how this would work the tighten up what the radius is speak the language and we would send it to the state and they would review that and they either review was not that hard the first couple took a while to get but we built trust that we were not doing crazy

things and then when it came down to, “Well who's going to pay for this paint and bollards” are nominal it's a it's a thing that most municipalities already have at some point out here.

This curbing needs to be fixed. I leveraged PROWAG so many different times because using that that was that was one of the excuses to initiate a good project so if at a city level if the city came up with a design there is an application just as if you're a developer that you can submit that to the state it's better received from a city than a private developer you kind of move up the ranks a little bit faster. City staff know the state people so they have a more of a personal relationship to get the proper feedback and then at the city is willing to make the monetary investment. And we're not talking about big numbers here. I've yet to really meet a city agency that says no but working through that and and I've done that personally so so I know that this is possible, I've done it in multiple state jurisdictions.

We need to get away from the technical brush-offs. We need to acknowledge that somebody died here, we need to acknowledge that more will die here because we have a pattern of that and we need to get off of our tails and get up and take action. I'm very frustrated with this apathy we have out there that, “well, nothing will ever change”. Well we have a fatality that occurred here, we have multiple families that have been impacted here I'm looking at this intersection we've already identified multiple things that have just been done in the last few years that don't meet PROWAG. They don't meet the most basic standards of accessibility as a blatant inconsistencies. We've also identified things that don't meet the traffic standards that are out there so we can go straight to those books we have an opportunity through small things to do that and I think that if folks are motivated to do the right thing there is a process to do that.

I'm telling you it is possible so regardless of who controls this road if it's important to the city they have an avenue to get this done using the next smallest steps by using the simple things to test. You don't know what the curb radius is, we don't have the money to do all the concrete

work, what can we do with white filling the delineator sticks and paint to test to see how this is going to get away out to get the alignment correct.

Ben Payment: How do we how do we help push that as citizens on our own? Because you know we're talking about this crash but I specifically got the brush-off about another US highway that's not a mile away from here where there was a guy in wheelchair who got knocked and killed and I said well it's because there's not a sidewalk on the south side of the road and the the pedestrian crossing goes straight into grass and so he was riding on the road and his wheelchair and the city just said, “well that's the state and we can't do anything” and that's what that's what they told us. And so that's really frustrating for me as an advocate you know obviously I brought up to the city the city brushed me off I tried to bring up the state and it's it's crickets because I don't - I'm not empowered even though I try right to push that rope and so are there are there any tools or anything you can help recommend? Any voice that you can avenue that you can help suggest to promote those kind of ideas?

Edward Erufrt: The first thing is - don't give up. That I will tell you. And you need to - it's hard because there's so many issues like this is such a broad piece - pick an intersection, pick a road, pick a location, and be consistent and relentless on it bringing attention up to it. There's lots of organizations that we've seen emerge places like Chattanooga Urbanist Society there's another group I think it's out of New Zealand that is Things Cars Broke they're using social media to raise awareness of this they send people to public meetings to bring these issues up again and again and again as citizens the folks that you elect are usually people you know. At Strong Towns we talk about local government, municipal government being the highest level of collaboration. I assure you that they're probably as frustrated with this and they're overwhelmed with these like these concepts so working through what is the challenge here, what is the struggle?

And that area you talked about a missing sidewalk and a location first is why isn't it out there? is it there isn't the right of way? Okay, we have the right of way well is it that we don't know where the alignment of that needs to be you we can help figure out that alignment. Well we'll

be a citizen group and we'll show you where it needs to go now we need to go get a sidewalk. Put in concrete is not that expensive asphalt even cheaper as we're working through this let's figure out where we can stick these in at that say level. So as an advocate in the community I cannot stress enough do not give up. Continue to communicate this, share that concern and why it's a concern in simple ways with as many people as possible because we all understand we all walk every one of our trips starts and ends with walking so it's something that people can relate to there's a lot like at this intersection picking one or two things to work on that's where I would I would focus. I'd be focused on it once you have this success and you figured out how these things are done who you need to be at city hall who are your allies in this where are the staff that actually make that decision where is the budget that that comes out of you will learn that through that first project and you leverage it to do the second project, then you leverage it to do the third project. By that point there are others that are also doing the same thing you're doing and as other work daily work that happens in the city they people will realize that they can actually take that intervention ahead of time they could do it within the work they do every day but yeah.

Dario Gonzalez: I do want to say that on that city planning just sent me a message some of them are watching this session right now and they wanted to point out a couple things are I lost it here yeah there's the University Medical BRT project which is coming up I imagine that's been funded. Also there's been a grant submitted for transportation or any development along the same corridor and it should address bike pad infrastructure affordable housing and access management. I think those were three of our concerns so now knowing that these have been submitted Edward how do we address this? Do we examine the scope and insist that money be dedicated towards certain areas or what is the approach?

Edward Erfurt: So the Strong Towns approach – that's good, it's good that they're doing all of that planning stuff – but the Strong Towns approach is a much more smaller citizen driven piece. We describe this as a four step process the first thing is to identify a struggle. So at this intersection what - there are many struggles that we can see in this intersection but that three

of the four corners don't have a pedestrian landing or that there isn't a center median or pedestrian refuge in this - any one of those short-term pieces that we've talked about right? Identifying that struggle, what is the next smallest thing that can be done to address that struggle. And we talk about that with bollards and paint with the using temporary materials the city and state all the time they do maintenance a traffic when there's construction and they close lanes off and they redirect pieces they know how to do this and they have the stuff on on the shelf that's the next smallest step.

It's great they're doing all of those big plans but that next smallest step taking that is something that could be done in the next 24 to 48 hours it's something that could be accomplished in a week it's temporary so once we do it and we take that action we are able to analyze that immediately. We're able to see how people use it real time the folks –

Dario Gonzalez: - are something done through planning or engineering if it's so short-term there's really no no funding that needs to be applied for and the budget comes out of something existing which traffic engineering would have in this case I imagine or public works is that where you're saying?

Edward Erfurt: Yeah you know the public works folks they have half this material in the back of their pickup trucks or it's in the yard like these are these are temporary things so getting engineering on board to provide the guidance of where like is it we're going from a 14 foot lane to a 12 or 11 you pick they will provide that guidance then getting the folks that stripe the road you can get them out there with the equipment they have if it's not a roller they have a sprayer and again they've got guidance from engineering of this all of this can be done very rapidly at an intersection. We call temporary or some people may call it a pilot project it's an opportunity to test those ideas before you put expensive things in on the ground that would lead to that. Short-term immediate responses along the corridor that's the same thing with closing off some of the driveways what if what if you put up concrete barriers at some of the duplicative driveways a test and see what happens as a pilot you do it immediately and then you observe what happens.

And if the world doesn't stop and we see that people can respond to that they use utilize that for something else then when curb work comes down the street we do that work when the plan comes forward in the future and it will you know whatever planning they will do will take a year or two at least the engineer out plus more time to get money for that so we may we may be stuck with this physical condition for five years before they get to that point so as we're looking at these types of crash analysis studios the short-term things are the things that we are we're very confident that there are folks on the ground whether they're citizens engaging in this the city doing this the state stepping in whoever may be they can accomplish these things and then from that we can go forward and test observe that will build up the confidence in the community that when you do the big project. Instead of having 35 or 40 driveway cuts we've identified there are actually only 20 that are going to be on the corridor for that future plan because we've already incrementally closed them or built the interconnectivity in. Doing a sidewalk is not a big deal either I mean that you just get it into your annual maintenance that you're going to drop in that new sidewalk piece that's what the short-term pieces are about that we would advocate for from Strong Towns.

Tony Harris: Right yeah and I think there's something to be said about building confidence and momentum through smaller bets where it's okay to fail right where failure could be something that's pretty small, not super costly, and that you could recover from quickly. I do realize that we're a little bit over time , any other thoughts on recommendations before I move us toward close out?

Melany Alliston: Ben one other thing you could do is make sure that you're identified as a stakeholder that would get to review some of these project plans as they come through on the planning side if you aren't already.

Ben Payment: Yeah I certainly ask and unfortunately city has included me some but not as much as I would like.

Edward Erufrut: And with this I know that local folks are listening and watching to this from Strong Towns with our Crash Analysis Studio it's an opportunity to look at things differently right? We are an advocacy organization and would love to help with that next smallest step and work through that so I'm happy after the Crash Analysis Studio as we finish this report up if folks want to talk about it further or explore what some of the ideas are we can show other places around the country that have had a similar struggle and we can help show some of those concepts and ideas because clearly on the ground we've got folks that are very passionate about this that that want to improve this location. We would love to help, for Strong Towns to help that action occur on the ground in Huntsville.

Tony Harris: Definitely, great. Okay I'm going to move us into close out, thank you very much for those insights that was really informative. Yeah so, I'd like to give out some thank yous. Thank you to Melany and Dario and Ben and Ed for being our panelists today we really appreciate all of you participating with us. A big thank you to Larry Mason for nominating this crash in the first place helping to gather resources organizing some local supporters. I wanted to make sure that we gave a shout out to some Huntsville community members that I've seen coming in and out of my inboxes over the past several months: Vivian, Danny, Jacob, Morgan Austin, Joe Beth, Sarah think there may have been a few others as well that have assisted. Thank you to our sponsor for this event who is an anonymous donor and thank you to Strong Towns staff who have been helping with preparations for today. So, you'll be able to find a recording of this session and all of our question analysis studio sessions by going to strongtowns.org/crash-studio. There you will also soon find resources for establishing a crash analysis studio in your own community and our next studio session through strong towns will take place on November 21st and you'll be able to find more information about that on our website as well. So, on behalf of my colleagues and the assembled panel thank you for watching this session of the crash analysis studio and keep doing what you can to build a strong town. Thank you.