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Livable Cities that Work!

TECHNICAL MEMORANDUM

DATE: June 16, 2023

SUBJECT: **Addressing Negativity Toward One Way Streets**

Figure 1 *500 South in Salt Lake City: Five to Six "fast and furious" westbound lanes, with Stroad-like commercial uses. This Stroad would not be "better" as a two-way Stroad, with a 5-7-lane cross-section (same ugly, but more congestion). Keep the one-way but improve it with better design!*

While there are many examples of people-friendly one-way arterials, there are even more "Stroad-like" designs that are hostile to placemaking. The result is that many planners and urban designers believe one-ways are inherently hostile for placemaking in all situations. The truth, however, could easily be the opposite – especially when a 5-lane or 7-lane Stroad is the default alternative.

One-ways were deployed extensively in the 1950's and 60's as a means of managing high volumes of traffic into booming downtowns. Speed was the order of the day, so traffic engineers designed all streets, both one-way and two-way, with wide lanes, broad shoulders, and few land-use stabilizing amenities such as uniform street trees. Traffic signals on one-way streets can easily be synchronized to any speed limit, so engineers tended to set them for speeds at or above 35-mph, when 25-mph would have often been more appropriate for downtowns.

Over the decades, activity in many downtowns collapsed. High speed one-ways were often blamed for increasingly blighted adjacent uses. High speeds contribute to degrading adjacent uses, but are one-ways inherently higher speed than their two-way alternative in all cases? Many researchers mistakenly concluded "yes" because when they studied conversions back to two-way, they noticed average speeds were reduced back to pedestrian-compatible levels. Their observations make sense in some situations, but not others. First, they were reporting on situations where two streets went from three lanes in one direction to just one-lane in both directions with left-turn pockets at intersections. Thus, average speeds were reduced largely because it was impossible to pass slower moving vehicles. However, this research identifies a different situation: cases where the two-way alternative would be a suburban Stroad with two if not three lanes each direction. Thus, the argument that two-ways are slower because you cannot pass slower drivers is not applicable.

Further, these two-way to one-way conversions were often combined with additional placemaking and traffic calming features: reduced lane widths, improved aesthetics, etc. Two-ways took the credit for the benefits of traffic calming enhancements, but such enhancements can also be applied to one-ways.

In historic downtowns that have good grid systems and lack congestion, and where the resulting two-ways will only have one-lane each direction, such conversions may be reasonable and beneficial for walkability. Unfortunately, the success of recent conversions has "tarnished the brand" of one-ways, as many have mistakenly concluded that one-ways are bad for walkability <u>in all circumstances</u>.

However, the suburban auto-oriented environments the team explored in this effort were vastly different than the historic gridded downtowns where the two-way/one-way battle is being waged. The team demonstrated throughout this effort that one-ways have impressive untapped potential for catalyzing mixed-use development in auto-oriented suburban locations where it otherwise would be unlikely to occur. Consider some of these key differences between historic downtowns and suburban commercial corridors:

- Two-ways in historic downtowns are likely to have just one lane each direction (a benefit for speed reduction, as you can't pass slower vehicles). Two-way Stroads in the suburbs already have 2, 3, or even 4-lanes in each direction, so one-way or two-way will have no discernible effect on speeds, all else being equal.
- An argument for two-ways in downtowns is that many aren't congested, so the extra efficiency of one-ways isn't needed. For suburban Stroads, the opposite is often true - they struggle with incredible congestion, and as a result cannot handle higher densities. So efficiency is essential for higher density walkable development in these cases.
- The grid systems in downtowns, and their pre-WWII establishment, makes them already very walkable. Since suburbs usually lack a grid system, the creation of one-ways starts to help them have a grid system on which to establish walkable development.

For traffic calming in the suburbs, one-ways are better!

As noted, many researchers believe that one-way streets will always have faster-moving traffic than two-way streets, and thereby are unlikely to offer anything helpful for catalyzing walkable environments. However true this may be for historic downtowns, it is definitely not true for large suburban arterials. This then begs the question, what are the factors that influence speed? We already saw that for cases where two-way streets will have one lane each direction, two-ways will end up slower than one-ways, all else being equal. But is all else equal? Does it have to be? Consider these additional factors:

Traffic signal synchronization: One-way systems are easy to synchronize perfectly. Want traffic to travel 45 mph? Set the signals to turn green at 45 mph. Want 25 mph? Set them to 25 and drivers will quickly comply because they easily see that faster just means they arrive at the next light a little too early. Two-way systems with 4-phase signals are impossible to synchronize very well. Since drivers can't discern any timing, they tend to drive about 8-10 mph above the speed limit if they perceive it is safe to do so. For this reason alone, one-ways can achieve safer average speeds than multi-lane two-ways, simply by synchronizing for the desired lower speed.

Traffic calming design: Many older one-ways have wide lane widths and empty shoulders that encourage speeding. This is not unique to one-ways, as many two-ways have the same conditions. But people see the high speeds and scapegoat the wrong thing - they assume the speed is due to one-way operation, when in reality, it may have more to do with wide lanes and a lack of traffic calming features. Traffic calming can be applied with equal effectiveness, whether one-way or two-way.

Motivations for speed: The thing that matters is not so much the present speed of the car, but how long it takes to get from origin to destination. When we are excessively delayed by red lights, side-friction, and congestion, engineers try to make up the time for you with higher speed limits. But if there is a way to significantly reduce congestion and red-light delay, there will also be less pressure to maintain higher, more dangerous, speed limits. Since one-ways will always have less stop delay than a two-way 4-phase Stroad of the same volume, there is also more opportunity to introduce traffic calming without making overall trips take longer. This is yet one more advantage that one-ways have over two-way Stroads in actually achieving people-friendly speeds.

Graphic Examples

As a picture is worth a thousand words, these pictures help make the case that One-Way Streets can be excellent for walkability – especially when compared against their two-way Stroad-like alternatives.

Figure 2 *Excess right-of-way from two two-way Stroads is used for better streetscape and for multimodal "slow lanes" (teal color)*

Figure 3 *Converting a single two-way Stroad intersection into four walkable one-way intersections.*

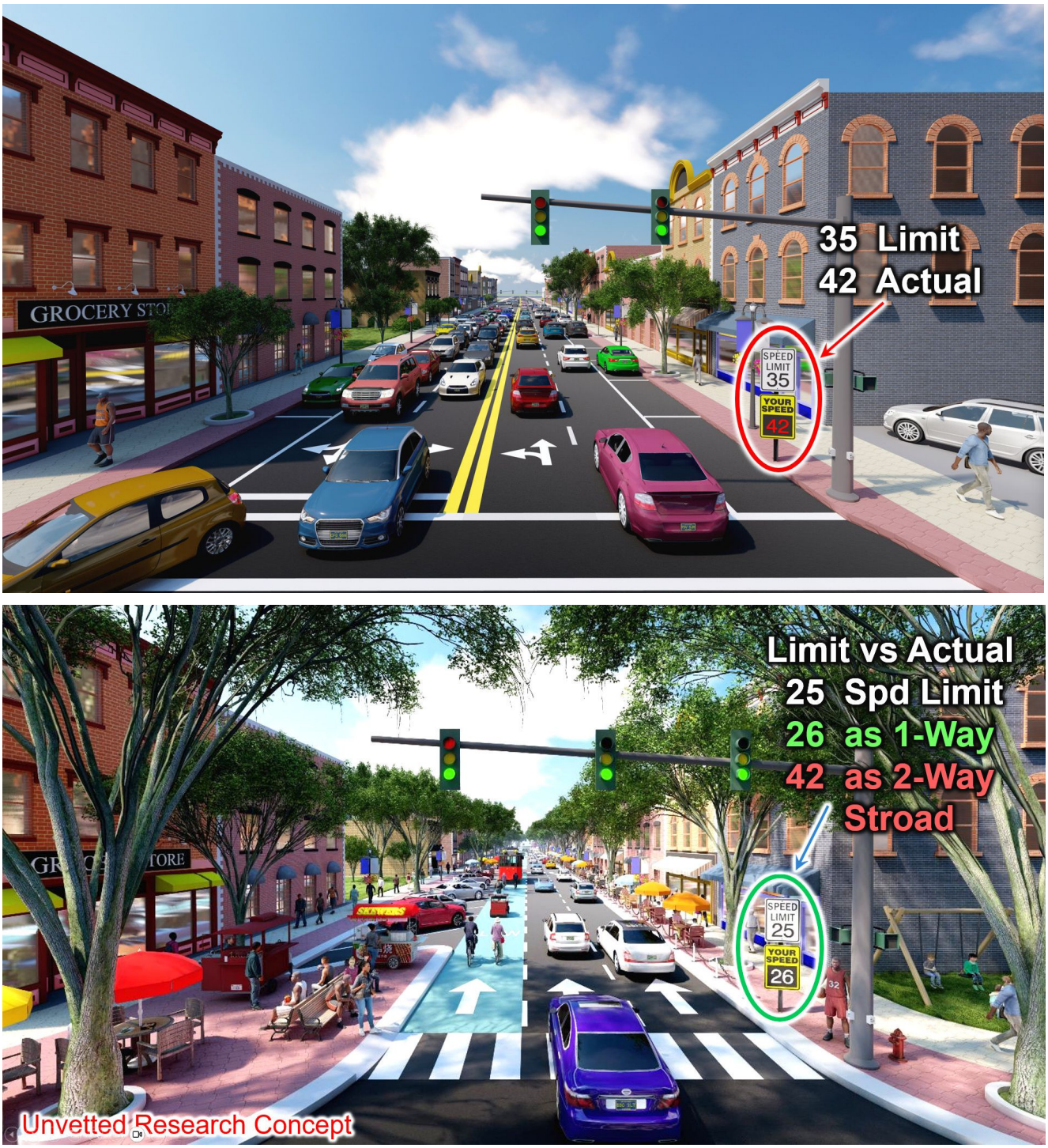

Figure 4 *Signal synchronization, only possible with one-ways, makes it easy to reduce speed limits and get driver compliance, since they arrive at the next signal a little too early if they speed.*