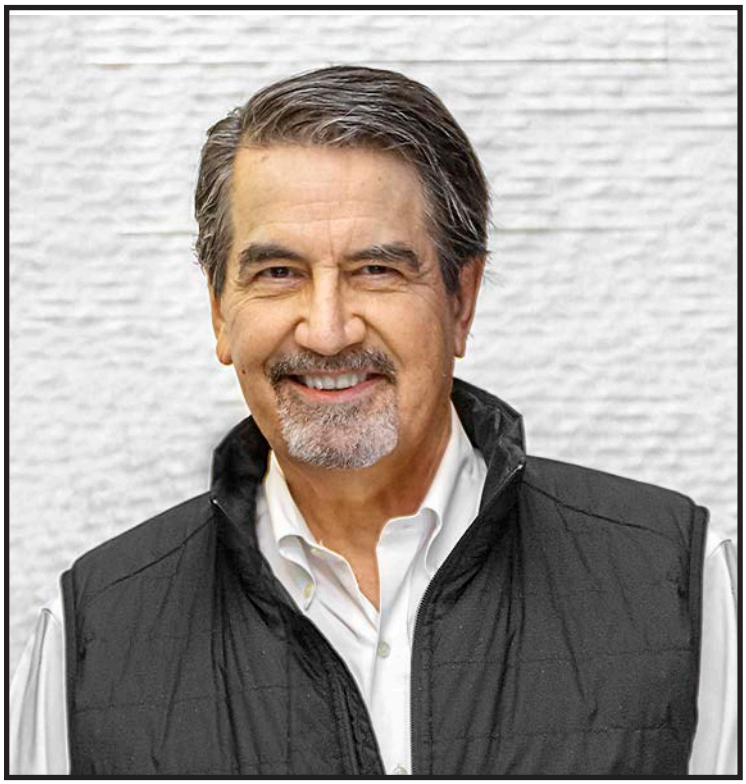
# 45/345 Economic & Community Development Plan

Urban Key, LLC

Spring 2021

SPACE BETWEEN
Design Studio



This document is dedicated to Wick Allison (1948-2020)

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2011

- City of Dallas and Downtown Dallas, Inc. finalize initial Downtown 360 Plan stating, "the freeway loop that has come to define Downtown Dallas is also a significant barrier to surrounding neighborhoods...the freeways sever streets, block views, interrupt connectivity and create noise and undesirable "voids" in the urban fabric. Rectifying the damage the freeways have caused to Downtown and adjacent areas is a long-term and expensive proposition."

2012

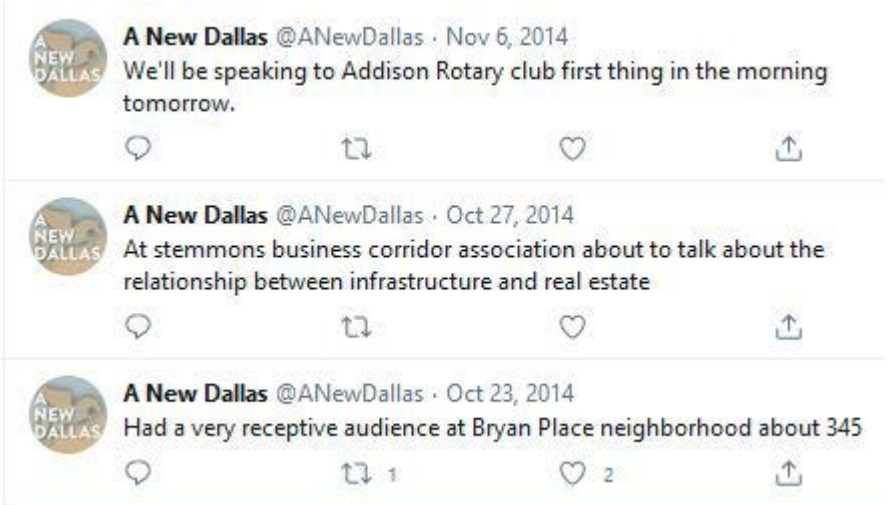
- TxDOT hosts public meeting on future of IH-345 (https://www.dallasnews.com/news/transportation/2012/12/12/at-txdot-hearing-leaving-comments-and-making-the-case-for-tearing-down-highway-separating-deep-ellum-downtown/)

2013

- D Magazine publishes first story on removing IH-345 (https://www.dmagazine.com/publications/d-magazine/2013/february/how-dallas-is-throwing-away-4-billion-dollar-investment/)
- ANewDallas.com goes live; gets 22,000 hits on first day.

2014

- D Magazine interviews Reverend Peter Johnson on the history of highway construction through South Dallas: https://www.dmagazine.com/frontburner/2014/04/what-does-south-dallas-think-about-highways-lets-ask-a-militant-black-leader/
- TxDOT begins repairs of IH-345 (https://www.bizjournals.com/dallas/news/2014/09/02/txdot-awards-666k-contract-to-repair-bridge-damage.html)
- Dallas Morning News architecture critic Mark Lamster writes in support of IH-345 removal: https://www.metropolismag.com/cities/dallas-tear-down-highway-says-local-architecture-critic/
- Patrick Kennedy of A New Dallas makes dozens of invited presentations to neighborhood, civic, and business groups across the city:




- The Real Estate Council (TREC) offers the city of Dallas $125,000 to study plans for IH-345 (https://www.bizjournals.com/dallas/news/2014/03/12/trec-to-fund-study-eyeing-controversial-i-345.html)
- TxDOT announces CityMAP planning process

2015

- Coalition for a New Dallas is formed as a political action committee (https://www.coalitionforanewdallas.org/)
- TxDOT finishes IH-345 repairs under budget (https://www.dallasnews.com/news/transportation/2015/09/11/i-345-repairs-cost-a-fraction-of-what-txdot-budgeted/)

2016

- CityMAP report completed by TxDOT and approved by Texas Transportation Commission
- City of Dallas passes resolution to depress D2 rail line through downtown Dallas. Doing so maintains surface street capacity without rail crossings.

2017

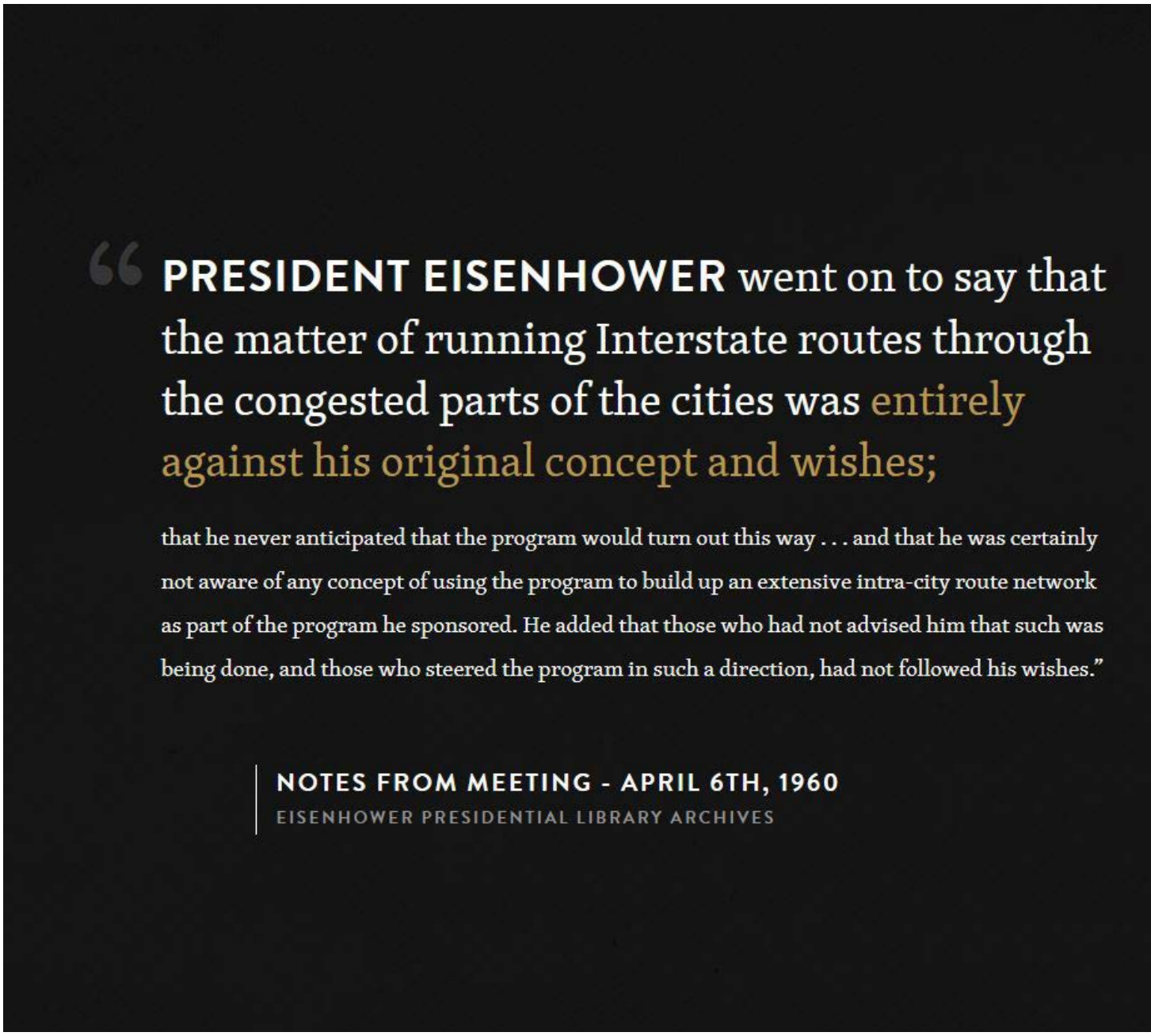
- City of Dallas and TxDOT announce intention to study feasibility of removing or depressing IH-345 as presented in CityMAP report (https://www.dallasnews.com/opinion/commentary/2017/10/17/dallas-might-be-ready-to-bury-a-downtown-highway-and-it-s-about-time/)

2019

- Dallas mayoral candidates debate IH-345 (https://www.fox4news.com/news/dallas-mayoral-candidates-griggs-johnson-split-on-i-345-teardown-proposal)
- TxDOT begins plans for I-30 through downtown, relevant due to the interchange with 345 and 45 (https://www.dallasnews.com/news/2019/10/30/txdot-plans-underway-for-i-30-canyon/)
- Coalition for a New Dallas hosts forum on highways, transit, and Vision Zero (https://www.coalitionforanewdallas.org/featured-posts/2019-agenda-for-a-new-dallas-summit-recap-whats-possible-is-doable)
- Coalition for a New Dallas hosts design charrette looking at all segments of 45, 345, and I-30 (https://www.coalitionforanewdallas.org/featured-posts/agenda-for-a-new-dallas-summit-design-charrette-results)
- Property owners and Coalition for a New Dallas hire Toole Design Group to build upon CityMAP plans and facilitate planning and design of IH-345, D2, and I-30 in concert
- TxDOT announces beginning Feasibility Study of IH-345 options (https://www.nbcdfw.com/news/local/txdot-to-hold-public-meetings-on-future-of-i-345-in-downtown-dallas/2267880/ )
- Coalition for a New Dallas hosts panel event on IH-345 and early concepts from design charrettes (https://www.dmagazine.com/frontburner/2019/12/the-public-is-hungry-for-research-and-data-around-i-345/)

2020

- Coalition for a New Dallas hosts Racism & Reimagination workshop open to the public (https://www.dmagazine.com/frontburner/2020/02/tomorrow-a-chance-to-hear-about-the-history-and-future-of-i-345/)
- Coalition for a New Dallas hosts online Racism & Reimagination event (https://www.youtube.com/watch?v=aZk1yhnTXfg&t=3233s)




## WHAT THIS DOCUMENT IS:

In 2016, TxDOT -- under the leadership of then-Texas Transportation Commissioner Victor Vandergriff -- commissioned an analysis examining the potential future of the major highways around, to, and through downtown Dallas. This study was called the Dallas City Center Master Assessment Process or CityMAP. The process rightly intended to involve public input at the beginning of the timeline in order to better shape outcomes as well as to include the economic and environmental impacts of scenarios outside of the right-of-way. The highlights and most relevant findings of the final CityMAP document are included in this report.

In 2019, property owners, the Coalition for A New Dallas, and Space Between Design Studio collaborated with Toole Design Group to build upon what CityMAP started; further refining design schemes for the future of the interstate 45 and 345 corridor through South Dallas, The Cedars, Deep Ellum, and downtown Dallas. This document highlights the key elements related to transportation, economic development, urban design, and equity / environmental justice issues that arose during the two planning efforts as the city moves towards choosing a Locally Preferred Alternative and the future of the city.

## PRESIDENT EISENHOWER'S TRANSPORTATION HISTORY

During World War I, the future President was a young supply officer observing logistical challenges of immense urgency: moving troops across the country, through cities, and to ports for overseas deployment given the prevelance of unpaved roads. In World War II, as commander of the allied forces in Europe, General Eisenhower saw first-hand the efficacy of the German Autobahn system for troop movement. It was a stark contrast to his own country's infrastructure.

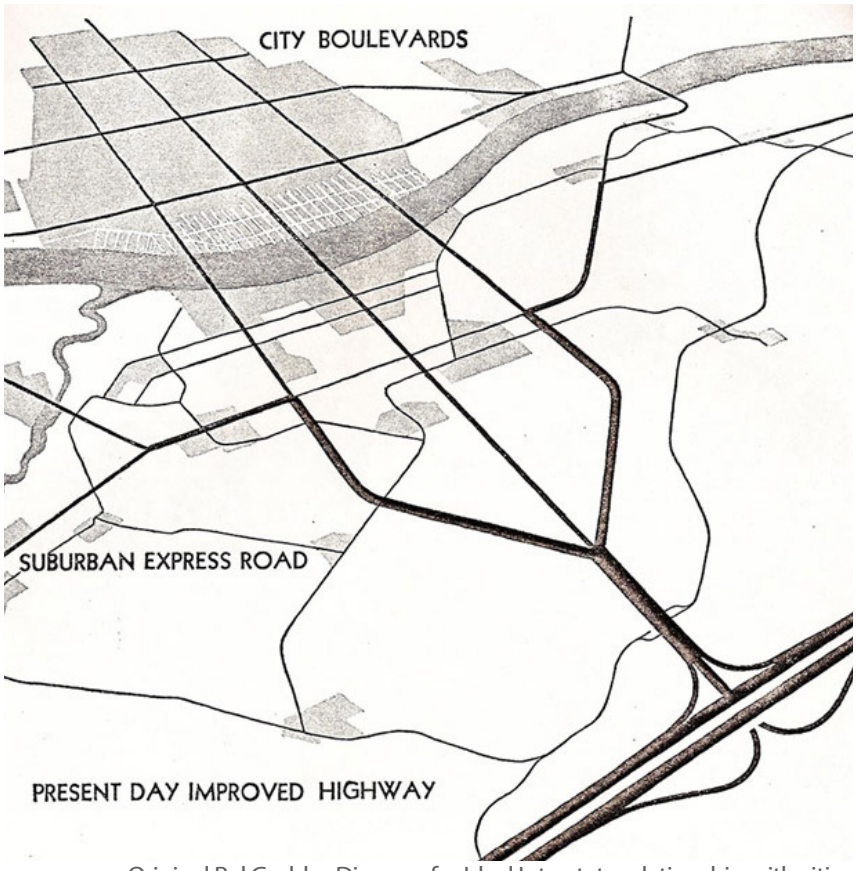
During the 1930's and 40's, there had been plans for building an American interstate system, much like the Autobahn, however these plans had not been funded by the federal government until President Eisenhower took office. Until then, these road construction projects were largely the burden of states to bear and thus not many highways were built. President Eisenhower worked with Congress to pass a series of Federal-Aid Highway Acts officially creating the interstate highway system and the highway trust fund to provide the increasingly larger federal funding match necessary to build these highways. This document is an attempt to re-capture the optimism of the time, without the missteps and maliciousness of highway building and intentional destruction of certain communities, in order to build better cities and transportation systems for the 21st century.

# NORMAN BEL GEDDES' MAGIC MOTORWAYS

Norman Bel Geddes was a stage designer for theater productions and an industrial designer who famously created the 'Futurama' exhibit for the General Motors' pavilion at the 1939 World's Fair. This exhibit re-imagined cities to be built entirely around the car promising an idealized new vision for the future. His work on the Futurama Exhibit likely inspired him to translate his ideas into book form, Magic Motorways, published a year later in 1940.

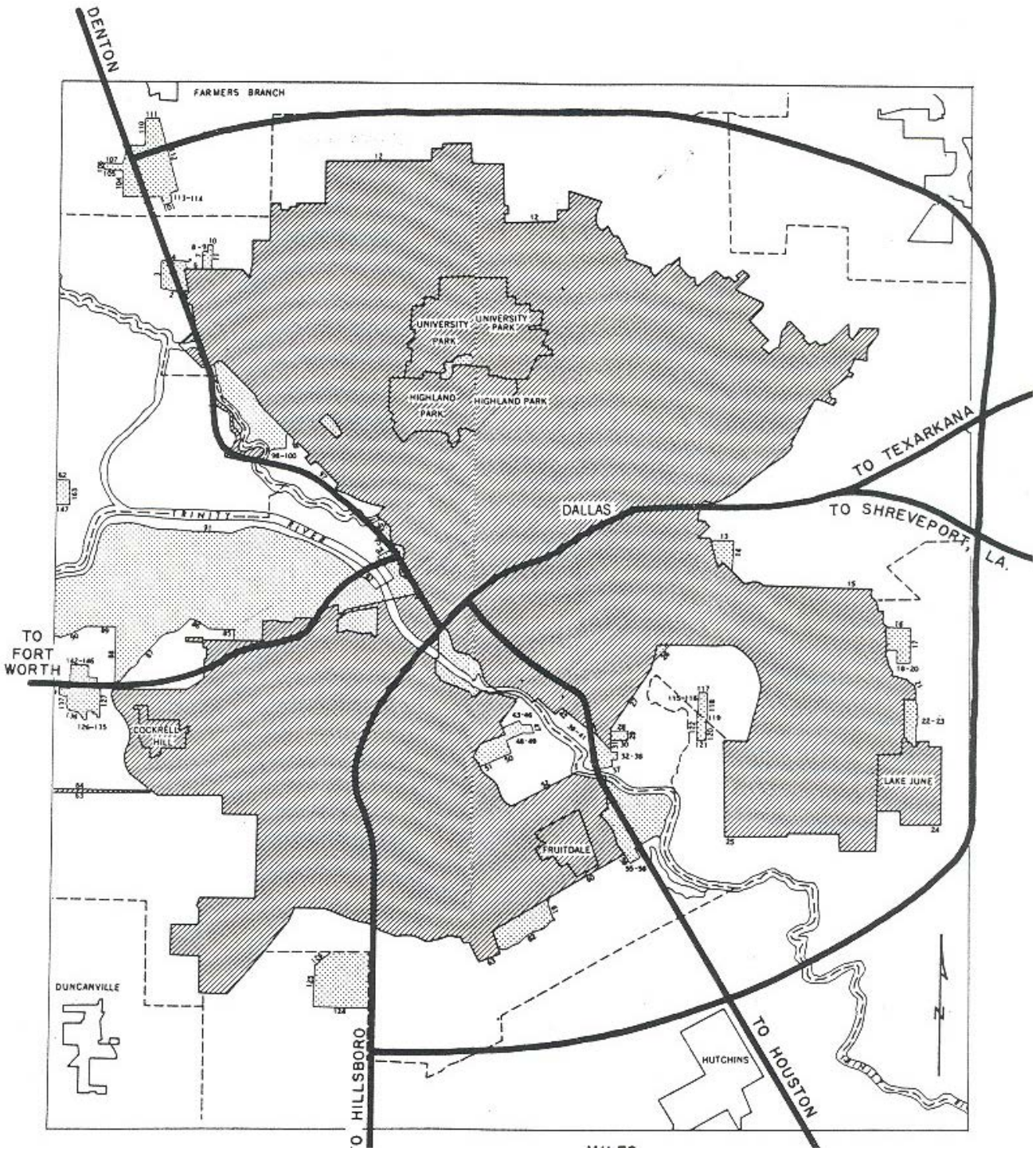
The book conveyed a number of ideas with the expressed intent and need to alleviate urban congestion. Bel Geddes specifically exclaimed, "there are too many cars!" The inclusion of his work is to focus on a key diagram from the book as shown to the right. In Bel Geddes' vision for cities, highways would not enter the center of cities, but instead transition to smaller-scaled streets more appropriate for the context of cities. His vision was similar to how highways were constructed in Germany which rarely enter the centers of cities and remain so to this day.

As Jane Jacobs wrote in Death and Life of Great American Cities, you need big infrastructure for big destinations, small networks to access small destinations. What she meant was conveyed by Bel Geddes diagram in that highways (big infrastructure) are useful when connecting to metropolitan economies, like Dallas-Fort Worth to the Houston area. But to get to the corner store or to school or any of these daily destinations, we need smaller-scaled network of streets to better access daily needs and routine, regular trips. *A critical distinction must be made between inter-city highways forming the functional backbone of the interstate system and intra-city highway, which are not needed.*




Original Bel Geddes Diagram for Ideal Interstate relationship with cities


Diagram by Ian Lockwood of Toole Design Group of how highways have actually been constructed through cities




## THE YELLOW BOOK (1955)

In 1955, the Department of Commerce at the request of President Eisenhower created a document entitled General Location of National System of Interstate Highways: Including All Additional Routes at Urban Areas, often referred to as "The Yellow Book" for the color of its cover. The document which served as the basis for the 1956 Federal Aid Highway Act conceptually laid out where interstates should be located in over one hundred cities. The federal government would provide ninety percent of the project cost, but the specific alignments would be left to local and state officials. While President Eisenhower was primarily concerned with public safety, evacuations and the movement of troops in the event of war, local officials often used this planning process to, in their words, "eliminate blight." The original plan for Dallas was to only build what we now know as interstates 30 running East-West, 35 and 45 broadly running diagonally North-South, and 635 orbiting the outskirts of the city. There was no 345 nor US75 as originally planned.

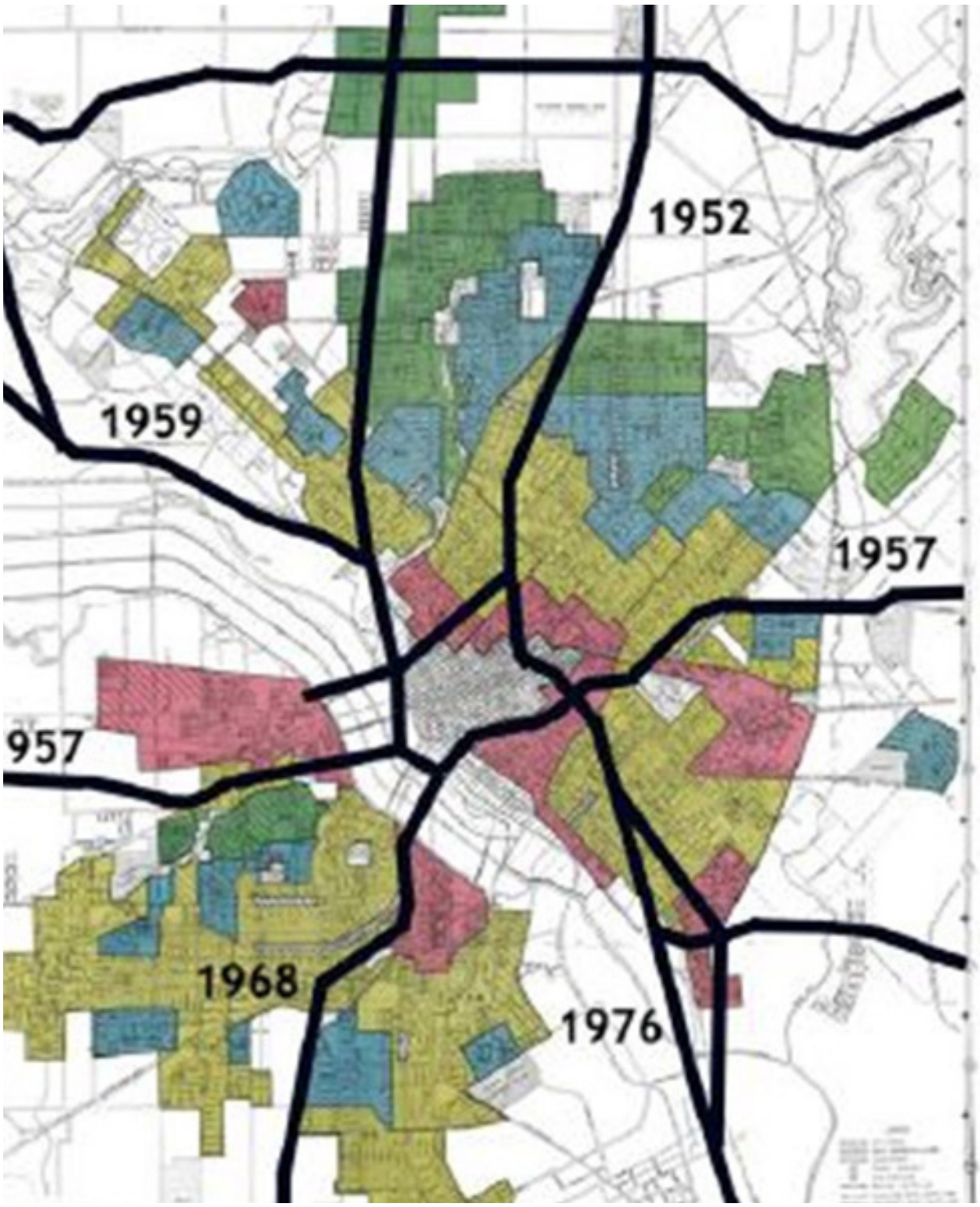



Image courtesy of Ryan Behring mapping highway construction to Home Owners' Loan Corporation (HOLC) 'redline' maps

## REDLINING AND HIGHWAY ALIGNMENTS

As is shown on the following pages, the intention to route highways directly through minority communities or along them to effectively isolate certain neighborhoods from the rest of the city is increasingly understood and documented. This also occurred at a time before it was required to compensate residents, businesses, and property owners for the takings of property and demolition of homes causing significant long-term damage to entire communities. The above map shows the historic red-lined neighborhoods of Dallas, which was a de facto form of segregation, and the alignment of existing highways.

## *Excerpt from Richard Rothstein's The Color of Law (2017):*

*"Alfred Johnson, the executive director of the American Association of State Highway Officials (AASHTO), was the lobbyist most deeply involved with the congressional committee that wrote the 1956 Highway Act. He later recalled that "some city officials expressed the view in the mid-1950s that the urban interstates would give them good opportunity to get rid of the local 'n----town.'""*

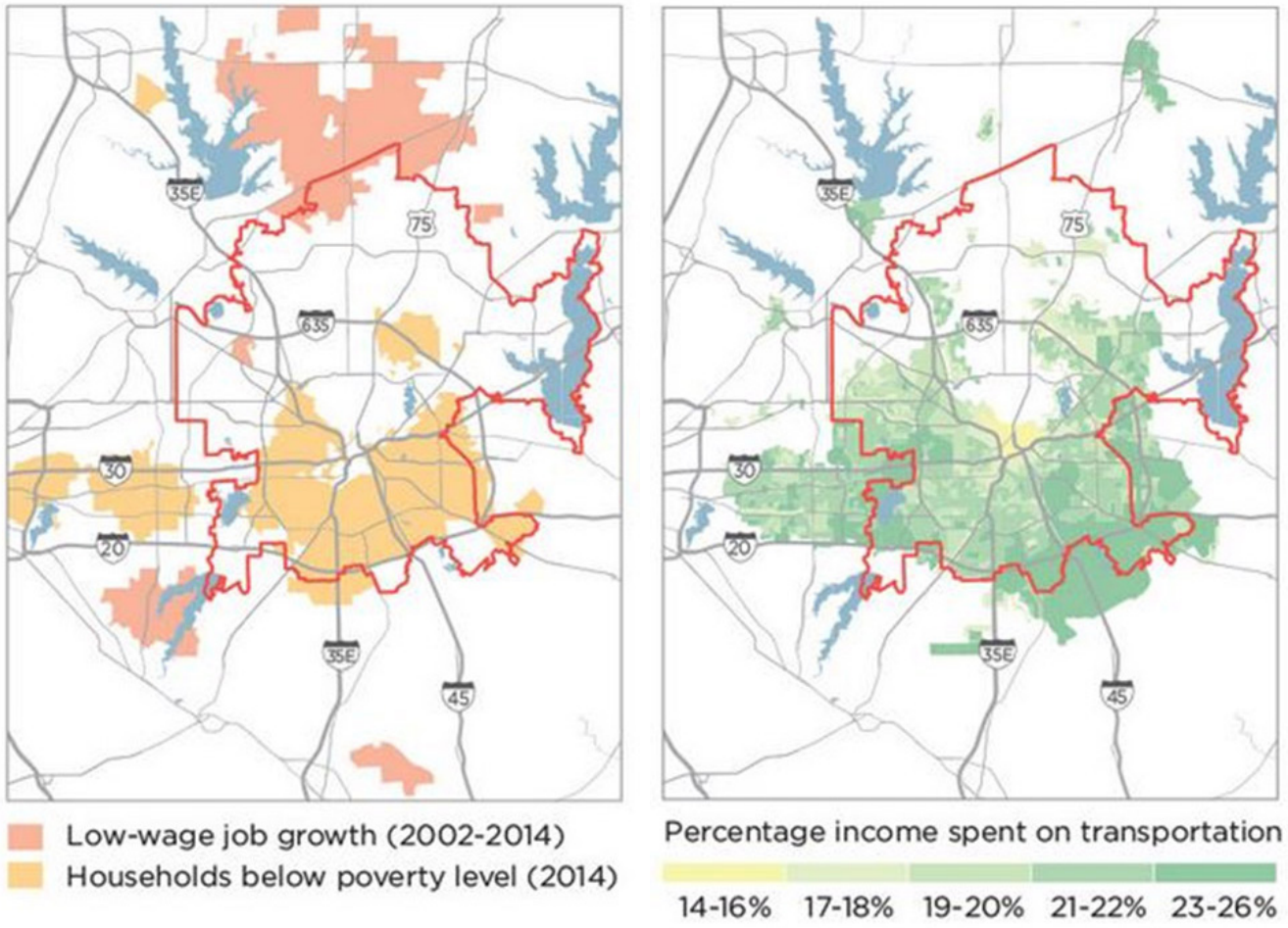
The clearing of land through the State-Thomas neighborhood for the construction of US75

## *Excerpt from Richard Rothstein's The Color of Law (2017):*

*"In few of these cases did federal or local agencies provide assistance to displaced African Americans in finding adequate and safe housing. When enacted into law in 1956, the interstate highway program did not impose even a nominal obligation on federal or state governments to assist those whose residences were being demolished. Although the House version of the bill permitted payment of moving costs to tenants in demolished homes, the* ***Eisenhower administration objected****. Council of Economic Advisors chairman Arthur Burns warned that* ***compensation would "run up costs" of the highway program, predicting that the system would evict nearly 100,000 people a year as it grew****."*

## INDUCED DEMAND: MORE HIGHWAYS, MORE VMT

As demonstrated in a paper from the University of Toronto, "The Fundamental Law of Road Congestion and Its Implications for Transportation Policy," more highway capacity increases the amount of vehicle miles travelled by residents. This typically takes place because the real estate market responds to highway construction and expansion by dispersing. Origins and destinations are not stagnant, but instead get further apart. The result for lower income communities is increased transportation costs either due to the need to own and operate a car or in the increased cost of time due to public transit not operating as efficiently to serve the increasingly sparse and disconnected land use patterns. Additional evidence of induced demand, its negative impacts, and the inefficacy of additional highway spending from the Federal Highway Administration (FHWA) is included in the Appendix of this document.




## DECENTRALIZED JOB GROWTH/ASSYMETRIC OPPORTUNITY

The result of highway construction has been increasing de facto segregation, division, and dislocation. As the Unversity of Texas-Arlington's Center for Transportation Equity, Decisions, and Dollars (CTEDD) report on the geography of job growth and transportation demonstrated in the diagrams shown above, low-wage job growth is mostly occuring far to the north while low-income households are primarily in southern Dallas (image on the left).

Meanwhile, the increased distance of dispersed land use patterns and investment puts disproportionate cost burdens onto low-income households who often have to spend the greatest proportion of their paycheck on transportation. Both physical *and* upward economic mobility must be achieved at lower cost. That means building infrastructure to re-orient downtown Dallas as the center of job growth and opportunity, closer to low-income households of southern Dallas and more accessible to public transit, drastically reducing the cost of transportation and, in turn, increasing the potential for upward mobility in the southern sector, the true American Dream.

The clearing of land through through South Dallas for the construction of US-175

*From an environmental justice perspective, should highway projects mitigate only new impacts or also the impacts and damage done of the original highway construction?*

# THE HIGH COST OF CAR-DEPENDENCE

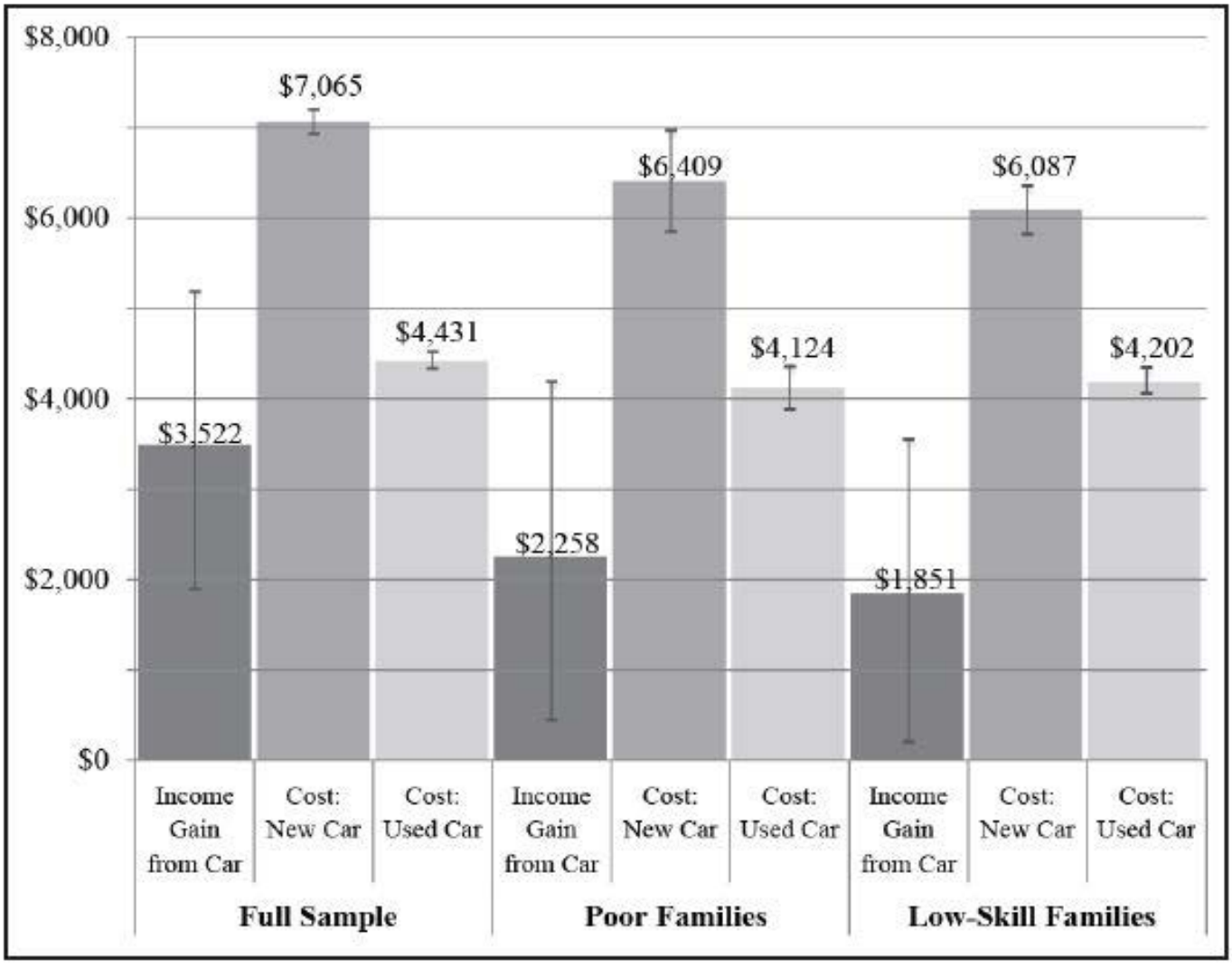



**Figure 11. Estimates Annual Family Income Gains and Automobile Expenditures, PSID 1999-2013**

Source: "A Longitudinal Analysis of Cars, Transit, and Employment Outcomes" by Mineta Transportation Institute and Rutgers University, 2015.

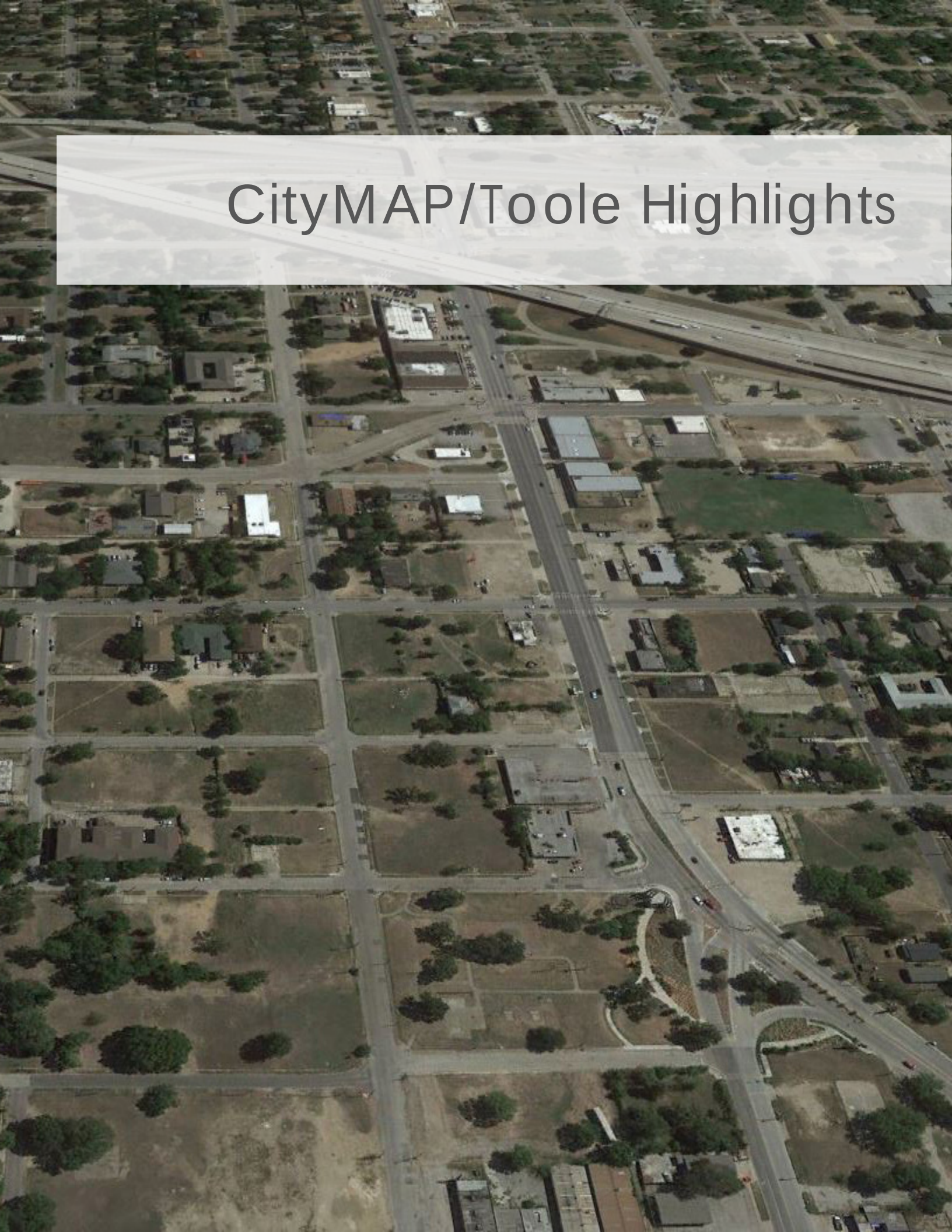
Most transportation planning efforts intend to improve travel time for drivers (charts in the Appendix show this is often not the case despite the attempts and investment). Little attention is given to the unintended consequences of these efforts. Some of these negative outcomes are imposed upon non-drivers, the environment, and depressing adjacent real estate value (in areas of existing development while exporting value to greenfield adjacencies). Furthermore, there is little proof that there are any positive outcomes including travel time.

In fact, prioritizing the individual driver as the prevailing goal of transportation planning has the negative outcome of essentially forcing everyone into owning a vehicle, whether they can afford to or not. As the study cited above (and the associated graph) shows, having a car does increase incomes. However, the cost of owning a car, whether new or used, often exceeds the income gain leading to worse overall outcomes.

As this report will show, the only answer is to address the jobs-housing imbalance and remove the infrastructure that creates car-dependence and the imbalance in land use and access to opportunity -- replacing it with jobs and housing in closer proximity and significant investment in multi-modal infrastructure.

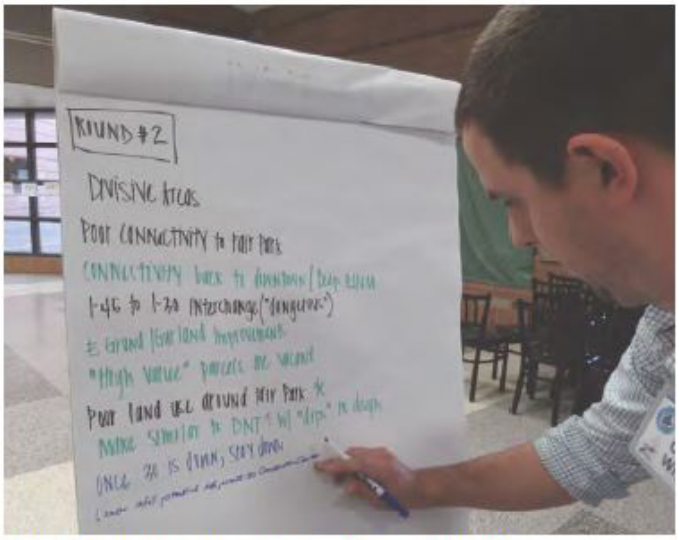

Original historic image from the collections of the Texas/Dallas History and Archives Division, Dallas Public Library
Before/After photoshop by Studio Outside

# CityMAP/Toole Highlights



PUBLIC LISTENING SESSION AND WORKSHOP AT DALLAS REGIONAL CHAMBER

PUBLIC LISTENING SESSION AND WORKSHOP AT AFRICAN AMERICAN MUSEUM IN FAIR PARK




NOTE TAKING AT PUBLIC LISTENING SESSION AND WORKSHOP

## PUBLIC INPUT

The CityMAP process correctly included public input at the beginning of the process so that it could meaningfully shape the proposed scenarios rather than as a 'box-checking' exercise at the end of the process as is typically done. It included robust stakeholder input, with over one-hundred thirty individual and small group interviews, and several large public meetings where residents could attend and gather around aerial photographs and discuss issues and suggest their priorities. Some images from these public meetings in 2015-16 are shown above and all of the public input and comments can be found in the full CityMAP report appendix.

The Toole Design Team reviewed all of this public input so as to be informed of what was said, what issues were most common, and to not be redundant. It was imperative that their work build upon the foundation established by the CityMAP effort as it further refines and defines the choices as the city moves towards identifying a preferred alternative. However, to better understand the issues in greater depth, the Toole Design team conducted twenty-four (24) hour-long interviews of key stakeholders, followed by a three-day design charrette by invitation and open to the public at the City Hall Flag Room. It was the efforts during these days that provided the early concepts as defined in the Toole Report as well as summarized in this document.


Summarized Priorities from the CityMAP Public Input Process

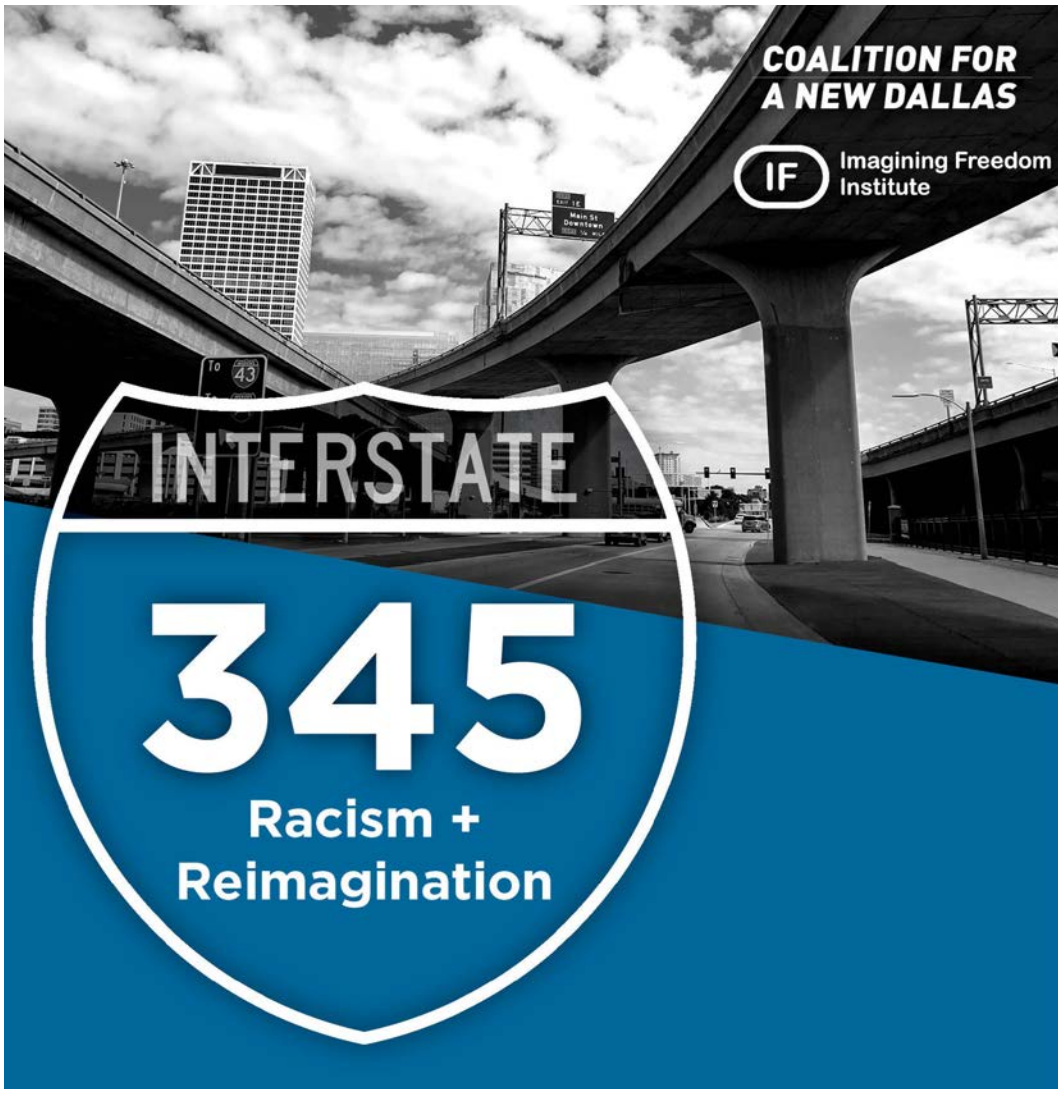
As shown above, the vast majority of public input responses overwhelmingly favored local improvements to the need for regional mobility. While the respondents likely skewed more local due to the location of the public meetings and the knowledge of the project and process, this may be an appropriate public response to the relentless prioritization of regional mobility and highway construction often at the expense of negative impacts to the surrounding communities. According to the CityMAP public input process, Quality of Life, Local Street Connectivity, Economic Development, and new Parks all should take priority in decision-making for the future of the 45/345 corridor.

Regional mobility has been local officials' focus for so long that the convenience and efficiency of the short-trip offered by compact mix of land uses is forgotten. We have chosen to spend billions each year in making the thirty-mile trip possibly one-minute faster when our daily trips (those to parks, schools, corner stores, grocery stores) and frequent transit should be possible within short, safe walking distances. But, these trips are not safe nor convenient often due to high speed traffic and infrastructure that divides and disconnects local networks. In fact, it could be stated that focusing on regional mobility has undermined universal accessibility due to the emphasis on speed and distance, which disproportionately benefits those fortunate enough to be able to afford a car while forcing everyone else into car ownership or dependence. Unfortunately, only approximately half the population is of age, means, and ability to own and operate a car. A new, more integrated vision of land use and multi-modal mobility is needed.

LISTENING SESSION WITH COMMISSIONER ELBA GARCIA

LISTENING SESSION WITH SENATOR ROYCE WEST

# RACISM & REIMAGINATION EVENTS

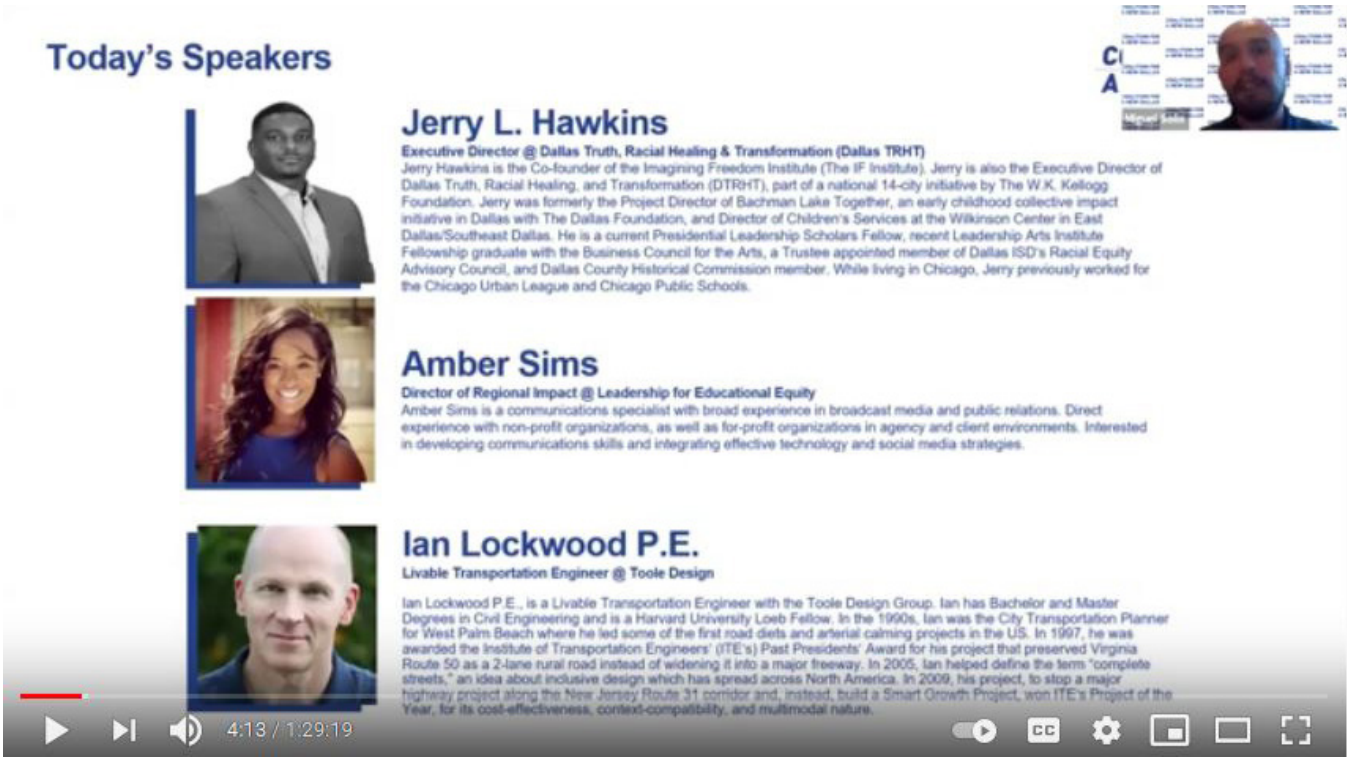



During the early months of 2020, the Coalition for a New Dallas - a partner in the creation of this document - organized public outreach events to introduce some of the early design concepts from the Toole plan. The intent was two-fold: to maintain contact with local community leaders and keep them engaged, while also soliciting their ideas and input for what might replace the highways if they were to be redesigned and redeveloped. The first of these events was called "Racism & Reimagination Equity Workshop" in collaboration with the Imagining Freedom Institute (IFI). At the first event, IFI provided a robust program which included a visual and oral history of the I-345 project and the impacted communities, an in-depth briefing on what current plans exist for the road, and an interactive planning session for what might replace the concrete. Most importantly, the workshop put a focus on racial equity, spotlighting the historically African American neighborhoods of Short North Dallas/State Thomas, Stringtown, and Deep Ellum that fell victim to the highway's construction.

# ONLINE LIVESTREAM PANEL

The initial intent was to continue to host these kinds of interactive events. However, the Coronavirus pandemic disrupted these plans. The Coalition for a New Dallas then pivoted to hosting live-streaming events via Zoom where anybody could attend given prior registration. Doing so allowed for the continued outreach and presentation of the history of highways across the country and specifally here in Dallas and the discussion of good urban design and inclusive development. Lastly, it also provided additional solicitation of input and ideas for what should replace the elevated highway, not just from a transportation standpoint, but also to advance economic development, opportunity, and restitution.

Toole Design Group's two options were presented by Ian Lockwood. As this document lays out, both options create new land and repositioning of existing land to be developed into something else, something more beneficial for private stakeholders, the public at-large, and potentially, those most negatively affected by the construction of the highways.




Screenshot from the Coalition for a New Dallas online roundtable event on Racism & Reimagination of highways in Dallas
http://www.youtube.com/watch?v=aZk1yhnTXfg&t=3233s

# OBSERVED TRAFFIC PATTERNS

As shown on the subsequent pages, the CityMAP team utilized traffic sensors to track general traffic patterns and approximate origins and destinations to better understand where traffic was coming from, where it was going, and what paths it took. It must be stated that traffic modal choice and patterns are a product of the environment: the systems and networks of infrastructure as designed, invested in, and constructed. What is useful is used, but may not be optimal or even beneficial without deeper analysis including the broader purpose of transportation which is improved socio-economic outcomes for all. Existing patterns nor trends necessarily indicate destiny nor possibility. It is up to leadership to decide whether existing patterns are serving the public's interest or, if not, what can and should be done to reverse the inertia.

The four diagrams on the following pages show the percentage of traffic (pre-COVID) during morning and afternoon peak travel periods (rush hours) utilizing the IH-345 corridor headed towards the greater downtown vicinity, what we might call local traffic, as well as the percentage of peak hour traffic headed to points beyond downtown and which direction it is headed.

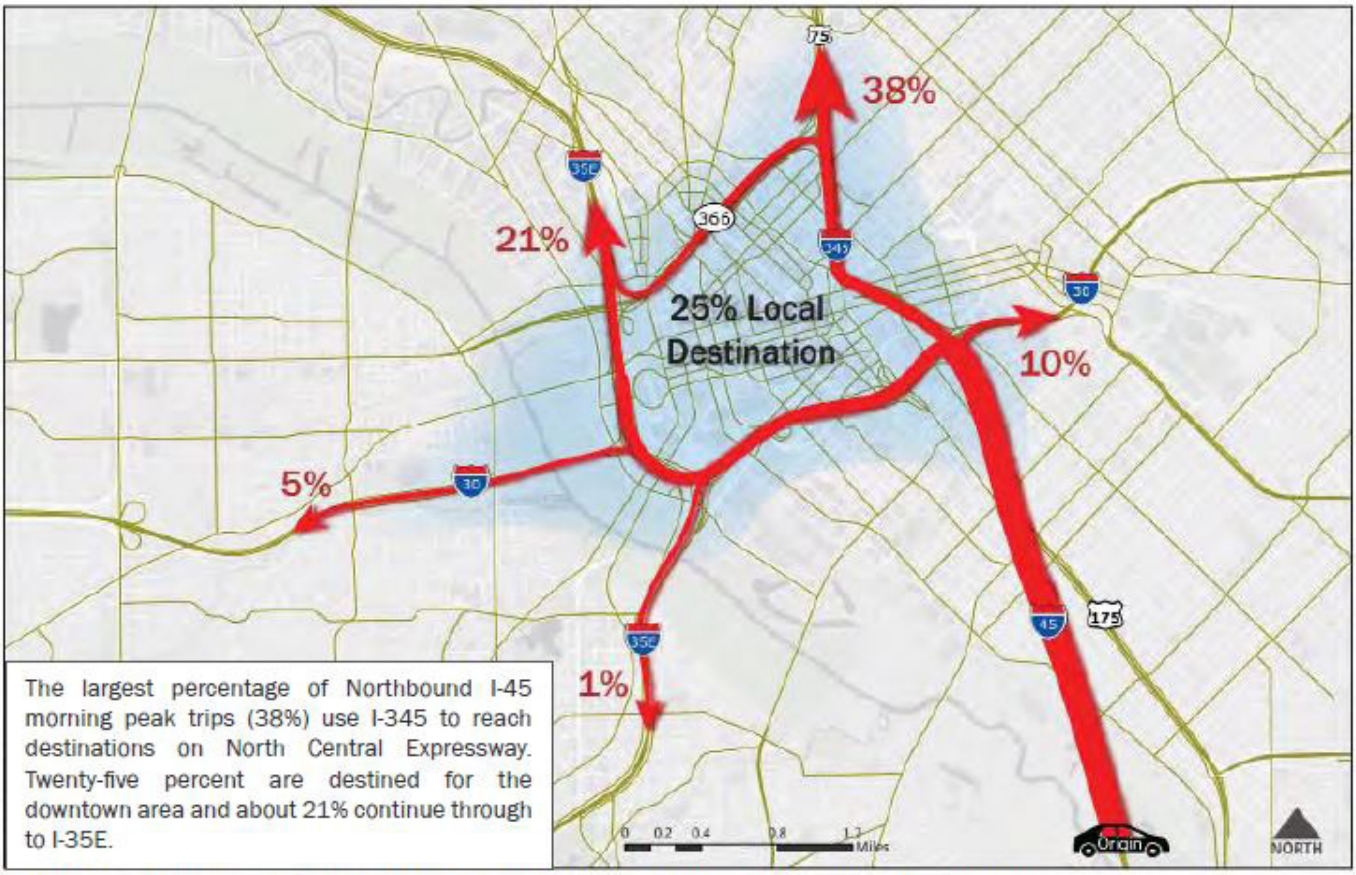



***FIGURE 4-7: TRANSPORTATION ANALYSIS OF AM TRAFFIC FLOW - ORIGIN: I-45*** *Source: Kimley-Horn*

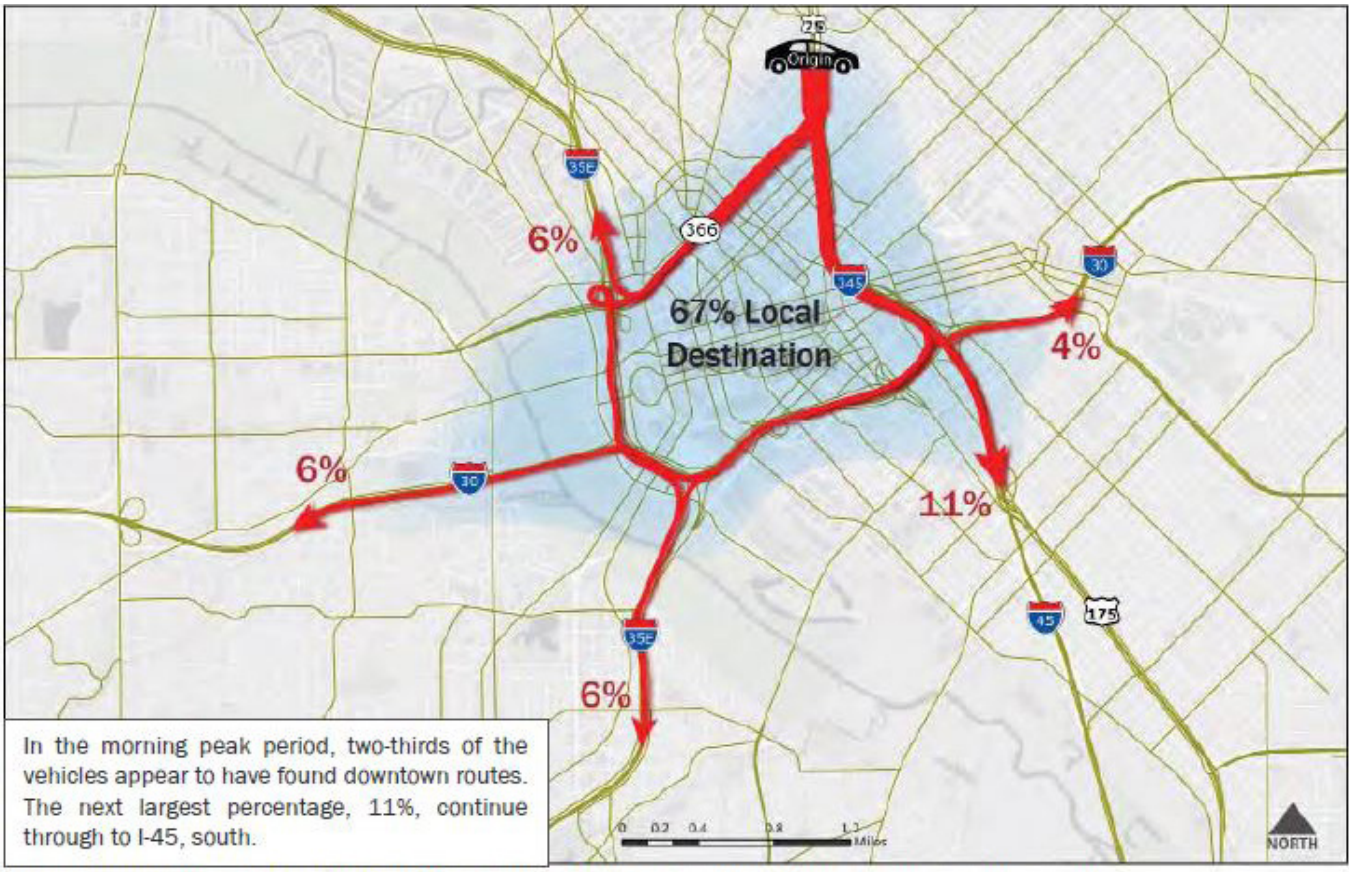



***FIGURE 4-9: TRANSPORTATION ANALYSIS OF AM TRAFFIC FLOW - ORIGIN: US 75*** *Source: Kimley-Horn*

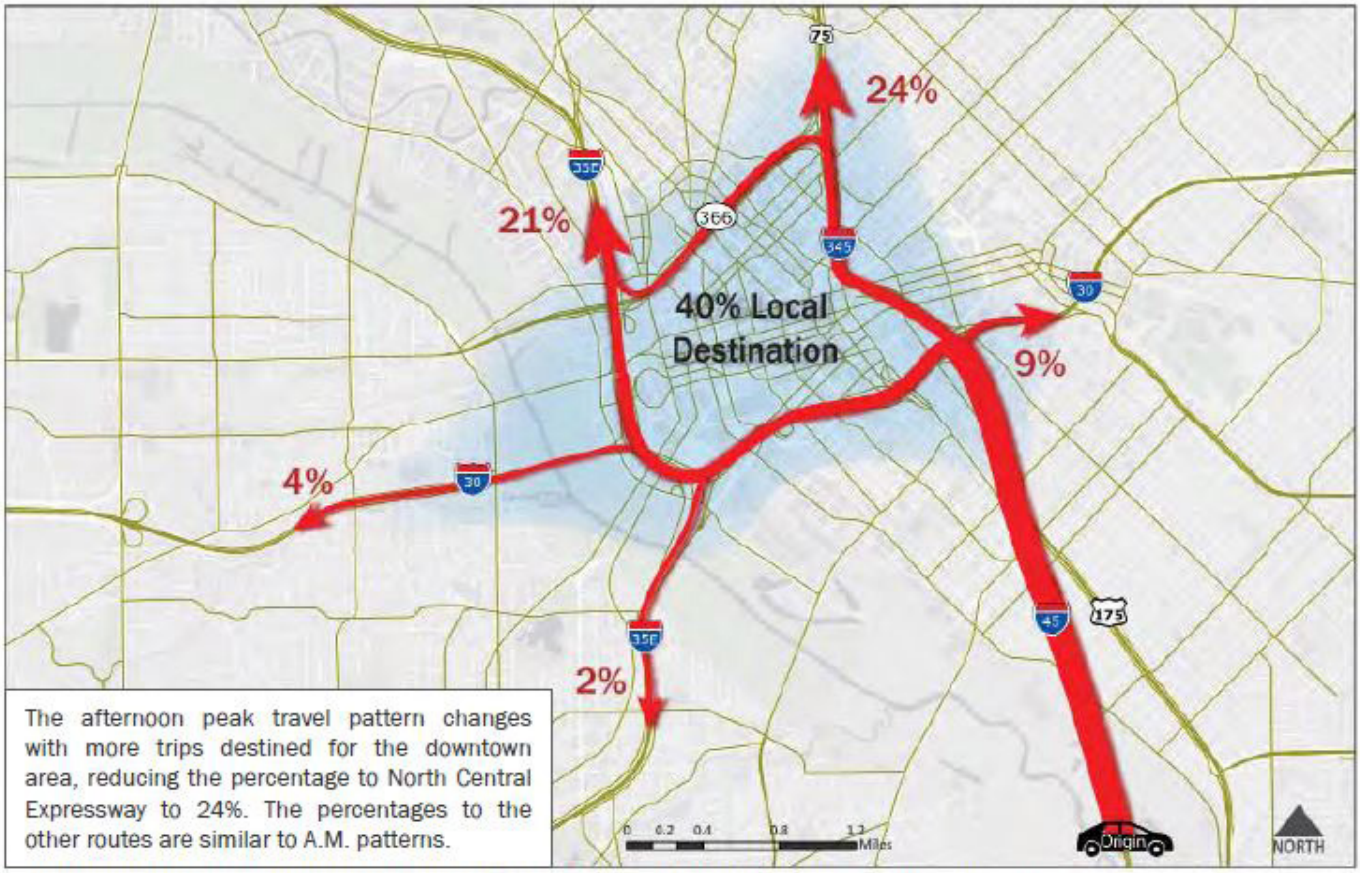



***FIGURE 4-8: TRANSPORTATION ANALYSIS OF PM TRAFFIC FLOW - ORIGIN: I-45*** *Source: Kimley-Horn*

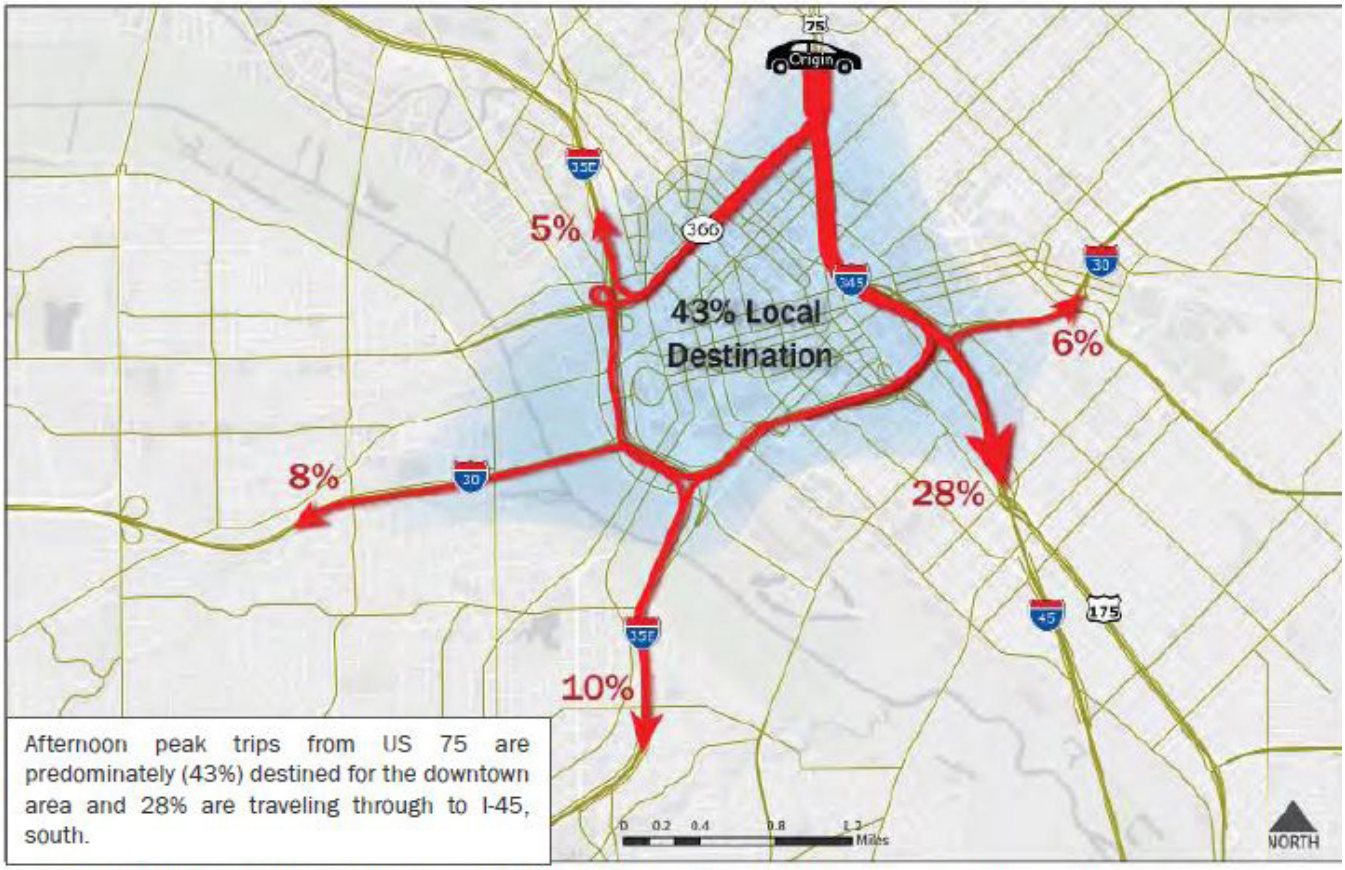



***FIGURE 4-10: TRANSPORTATION ANALYSIS OF PM TRAFFIC FLOW - ORIGIN: US 75*** *Source: Kimley-Horn*

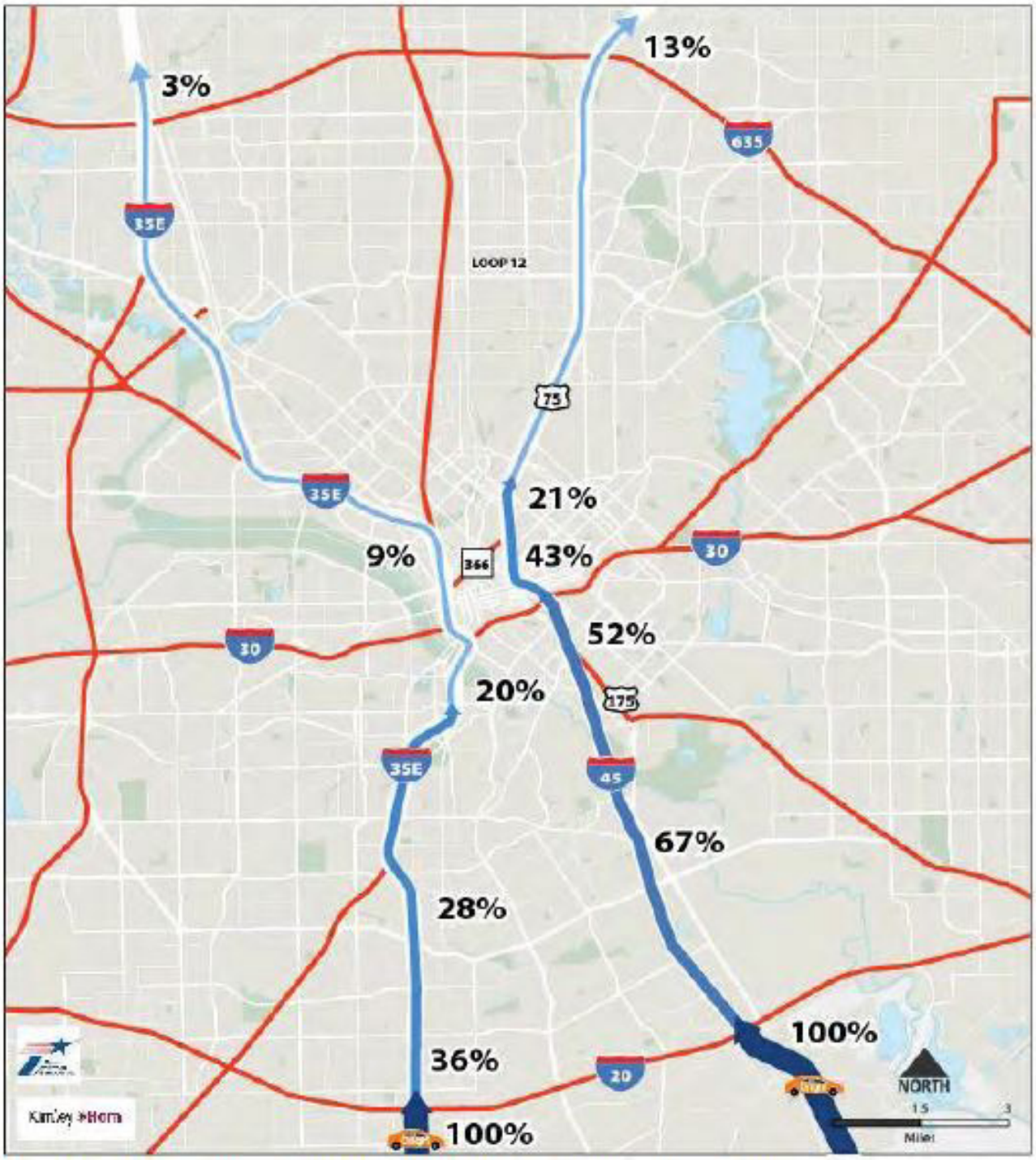



**FIGURE 4-19: WEEKDAY NORTHBOUND TRAFFIC FLOW** Source: Kimley-Horn

Summarizing the diagrams on the previous page, a quarter (25%) of northbound I-45 traffic is headed to downtown with 38% heading to points further north on US75 during morning rush hour. Meanwhile, two-thirds of southbound traffic from US75 is heading to downtown creating an incredible traffic load on the few exits from US75 and 345 into downtown. During afternoon and early evening rush hour, the percentage of traffic utilizing these corridors to reach downtown is 40% and 43% respectively, suggesting nearly half of IH-345 traffic is using the highway to access local destinations.

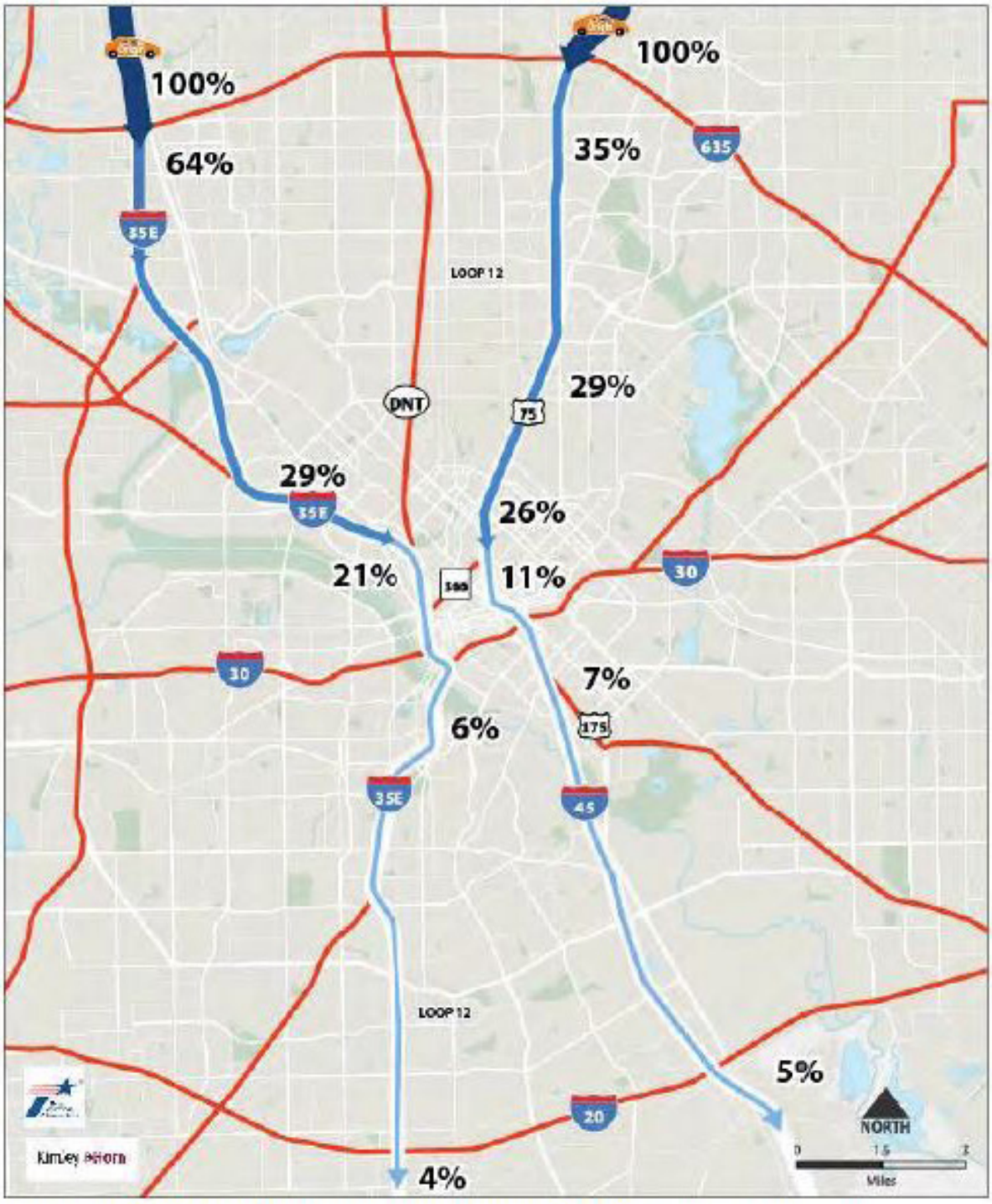
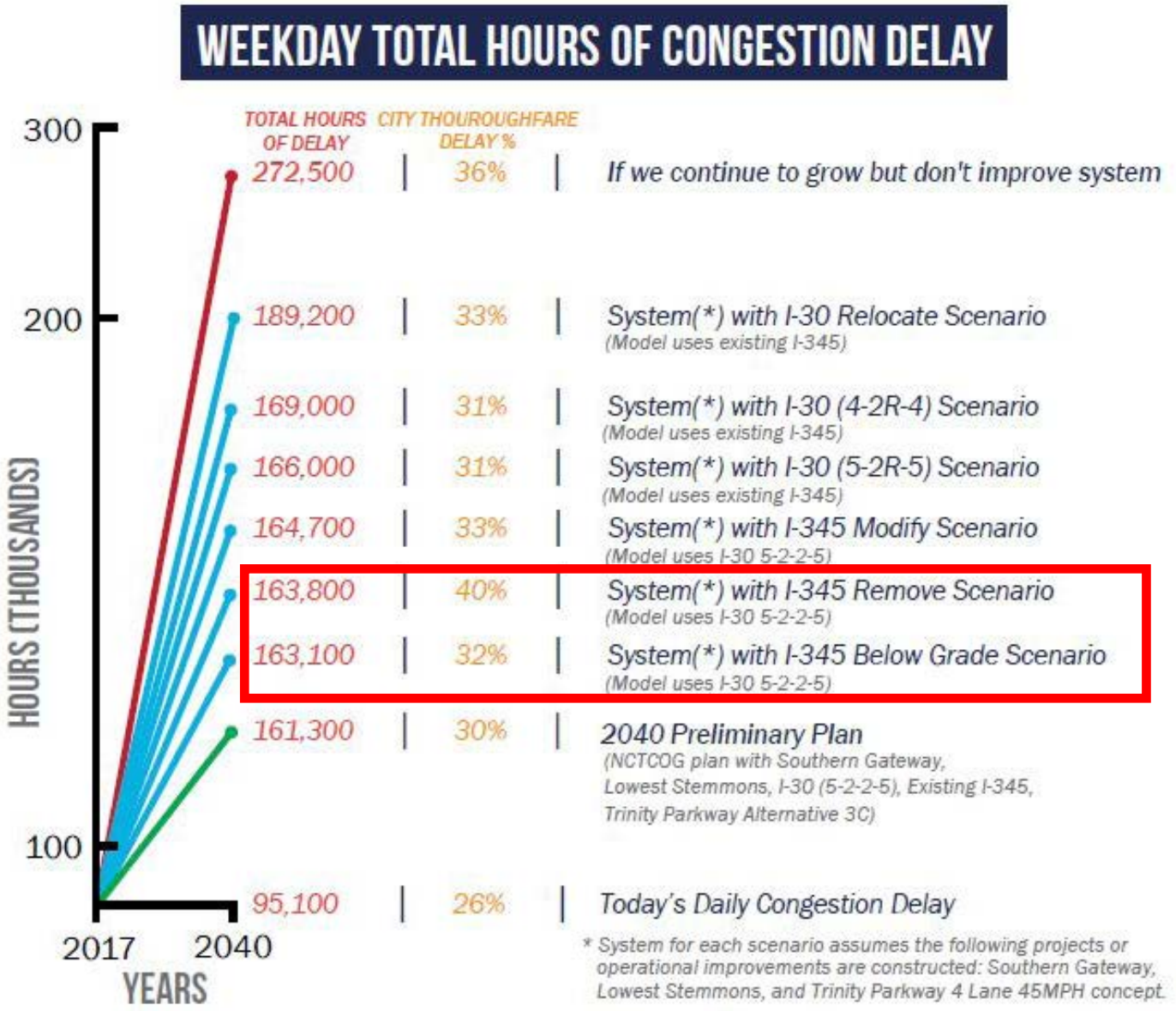



**FIGURE 4-20: WEEKDAY SOUTHBOUND TRAFFIC FLOW** *Source: Kimley-Horn*

The maps on the previous page and above from the CityMAP report attempt to summarize the regional traffic patterns for trips that originate beyond the interstates 20 and 635 beltway and how much traffic is merely passing through downtown. However, recent TxDOT data reported as part of the IH-345 Feasibility Study suggests inter-regional pass-through traffic that originates and is destined for beyond the city may be as high as 24%. This is traffic that should not be encouraged to pass-through the city and has no reason to be in downtown nor does it provide any positive outcome for the city. It only serves to create congestion and pollution in areas where we want to encourage more people to live, work, and play. Instead, it should circumnavigate the city on orbital beltway loops as intended rather than to get stuck in traffic in congested parts of the city.

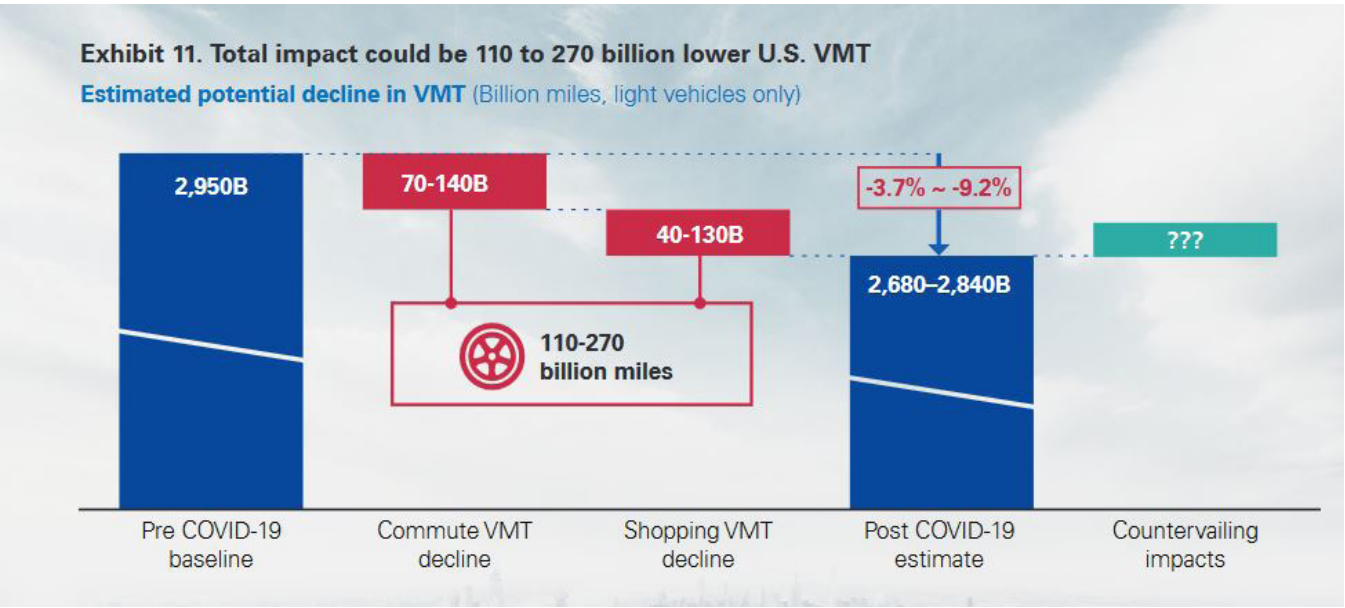



*Congestion delay analysis is for freeway/toll road and thouroughfare system within transportation analysis study area.*

The table above shows the expected annual hours of delay for all drivers for the various scenarios examined in the CityMAP analysis. Highlighted are the two scenarios believed to be preferred for the IH-345 corridor, a below-grade limited access highway and a removal and replacement scenario with improved network of surface streets. *The differences in amount of expected travel delay is virtually negligible.* It should also be noted that this is specifically a measurement of vehicular delay and is not a measure of quality or efficiency of other modes of travel such as transit, by foot, or by bicycle, all more spatially- and energy-efficient forms of travel with vastly reduced carbon emissions.

While the table shows an increase in vehicular delay on city thoroughfares, it could be argued that this new city street traffic has broader unaccounted for circumstances and benefits such as the increased vitality of local businesses through greater visibility and access on surface thoroughfares (for example, famous urban thoroughfares such as Michigan Ave. in Chicago, Wilshere Blvd in Los Angeles, and Van Ness Avenue in San Fransisco routinely move 45-50k vehicles/day. Champs Elysees in Paris carries 80k). Retailers look for traffic numbers and currently, most city streets in downtown Dallas are below the necessary thresholds to encourage ground level commercial investment and vitality. Decreasing the overall amount of cars on the road and improving the safety and convenience of other modes requires density. Furthermore, it is traffic speed that is more harmful than volume and long trips add more emissions and congestion than short-trips.

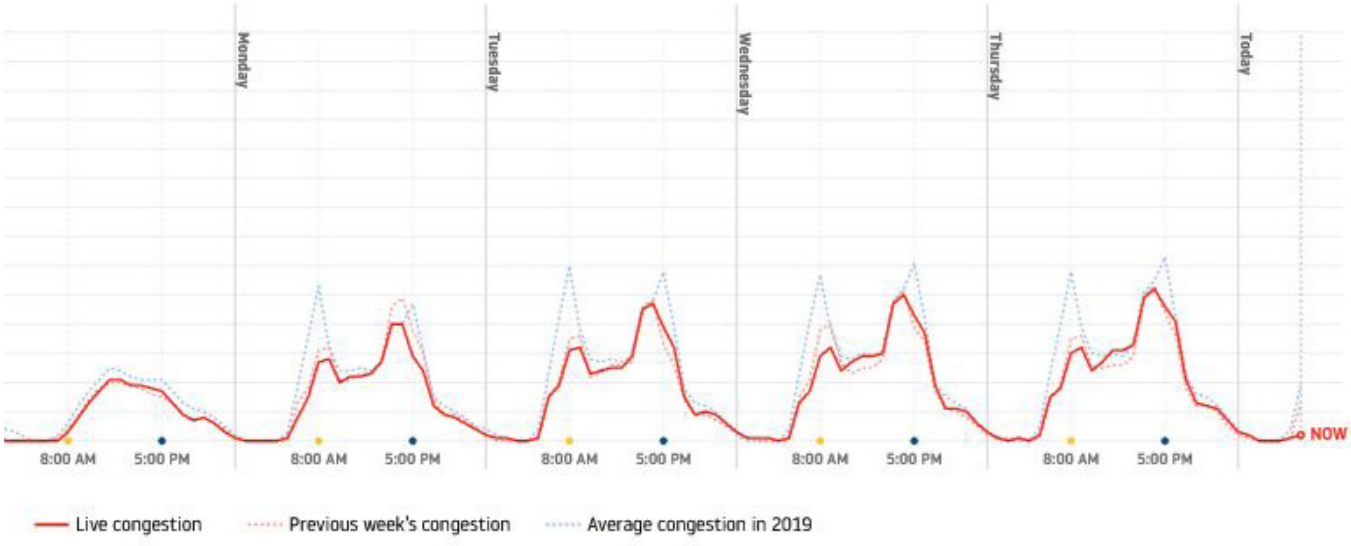
# KPMG ANALYSIS OF COVID IMPACTS ON VMT




The consulting firm KPMG conducted an analysis of how the Coronavirus (COVID-19) will affect long-term travel trends. The key chart from their conclusions is presented above showing that they expect between a 3.7% and 9.2% decrease in average annual vehicle miles travelled across the country. This expected long-term decrease in vehicle miles travelled from pre-COVID baseline projections is due to more people and firms realizing the potential and possibility of at least part-time telecommuting.

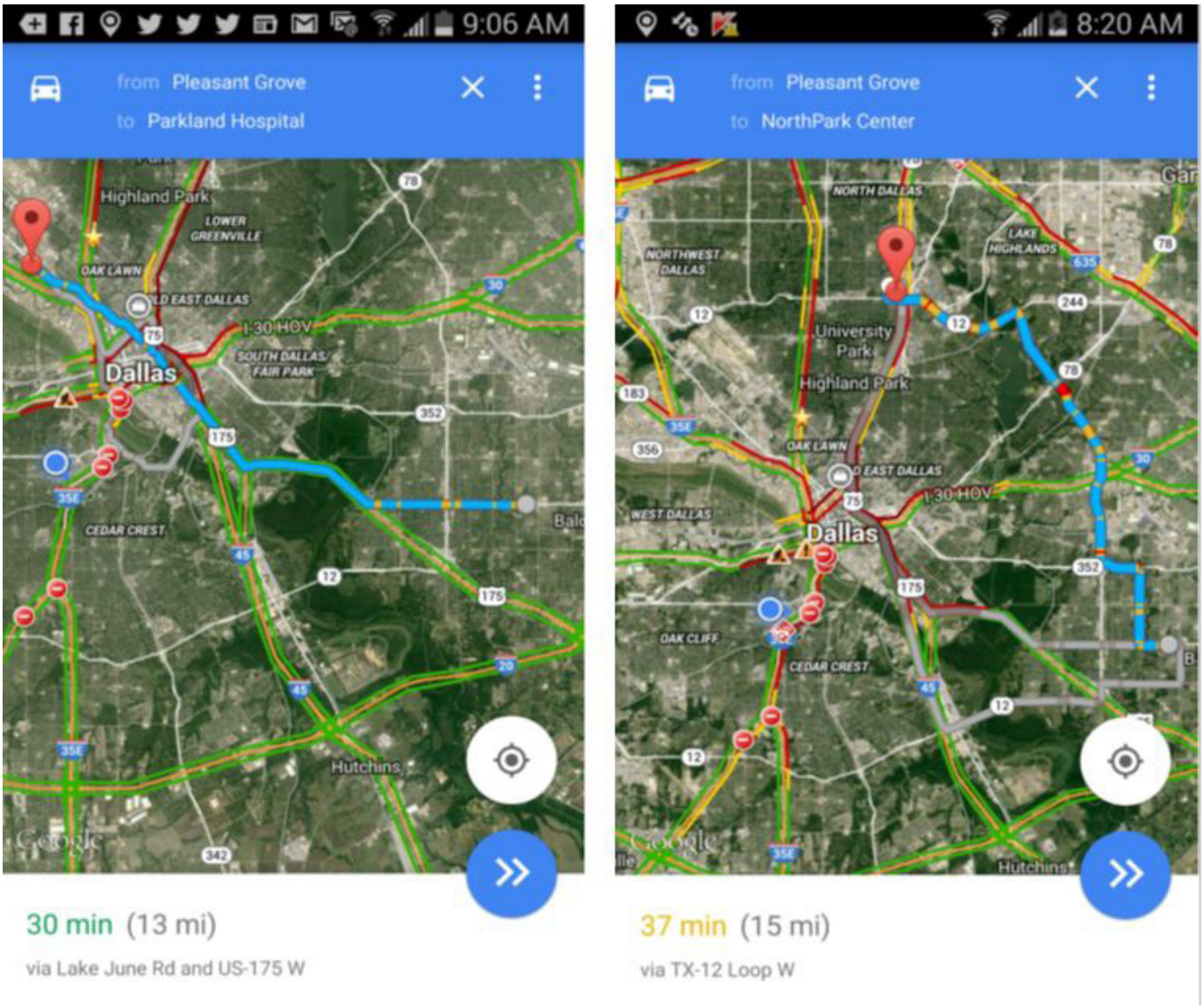
Furthermore, this could lead to more flexible working hours as demonstrated below. The city of Melbourne, Australia underwent a long-term, complete shutdown of the city in order to quell the second outbreak of the coronavirus. However, after four straight weeks of no increase in infections, the city re-opened. More than a month later and life largely back to usual (albeit without tourism), the TomTom traffic congestion survey suggests a general flattening of peak hour commuting with a fairly consistent 20-25% decrease in AM peak congestion and approximately 10% reduction in PM peak traffic.

# TOMTOM TRAFFIC CONGESTION INDEX




TomTom Global Traffic Congestion Survey for Melbourne Australia during the week of December 7-11, 2020 more than a month after re-opening

# HIGHWAY CAPACITY CANNOT SCALE WITH DEMAND

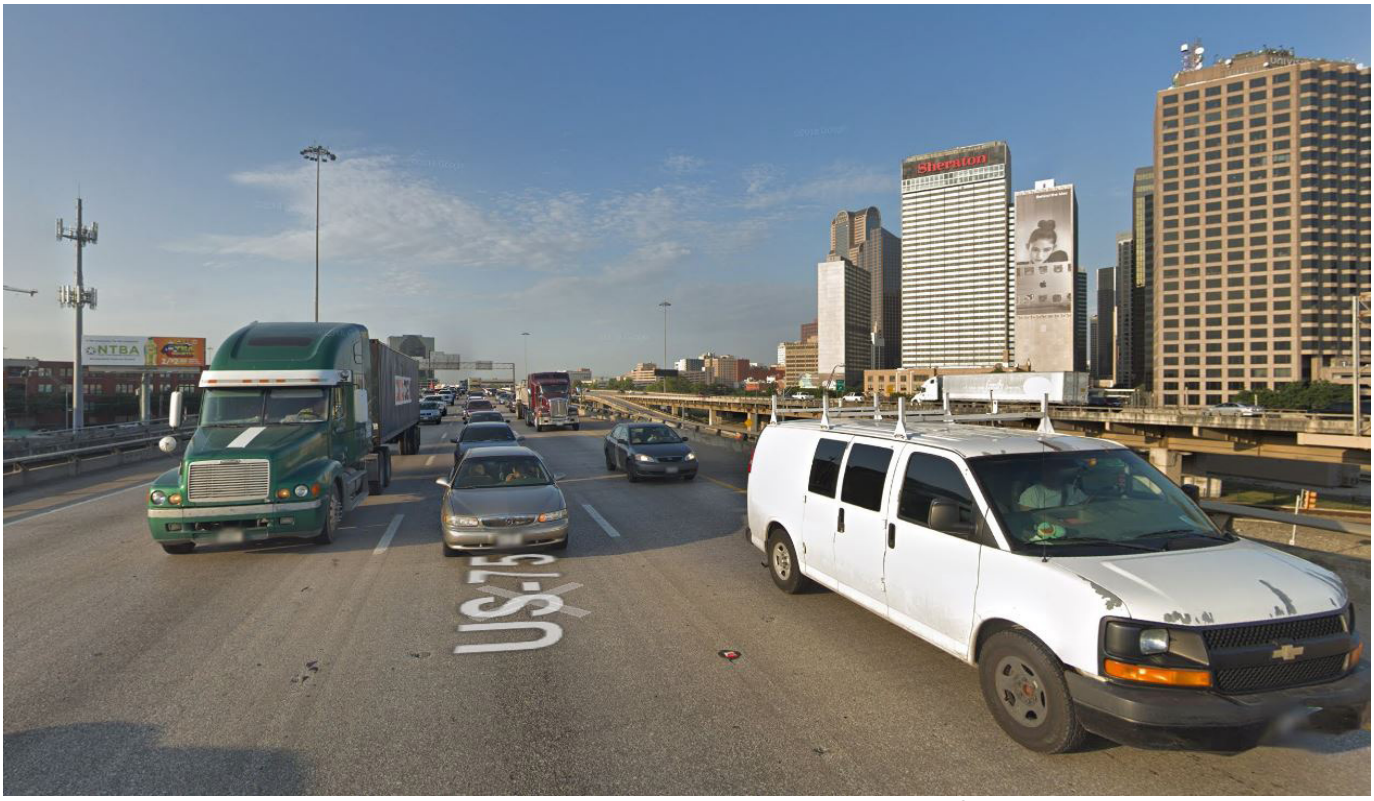



The two maps above show typical rush hour directions provided by google maps during AM rush hour to reach common destinations such as the Medical District or North Park Mall from trips originating in Pleasant Grove. These are trips that travel direction software would typically suggest taking IH-345. Instead, surface streets are often just as fast if not faster than attempting to use the downtown highways. However, since highways cannot scale with demand like public transit, which can simply add more buses or trains to existing infrastructure, funneling all traffic onto limited access corridors invariably creates congestion and delay.

A growing city and a growing economy cannot continue to expand corridor capacity because the land required for right-of-way expansion becomes too valuable. Furthermore, the fundamental laws of congestion and induced demand suggest that the benefits of increased capacity are quickly lost, often in less than five years as induced volumes rise to the new capacity resulting in more congestion.

This is the fundamental tension and conflict between highway forms and logic and that of cities. where highways emphasize limited access, singular form of mobility, and long-distance travel, cities are about abundant access, the efficiency of space, and agglomeration economies. Cities compress space and time to maximize efficiency, productivity, and the convenience of short trips.

# INVADED & ABANDONED SPACES

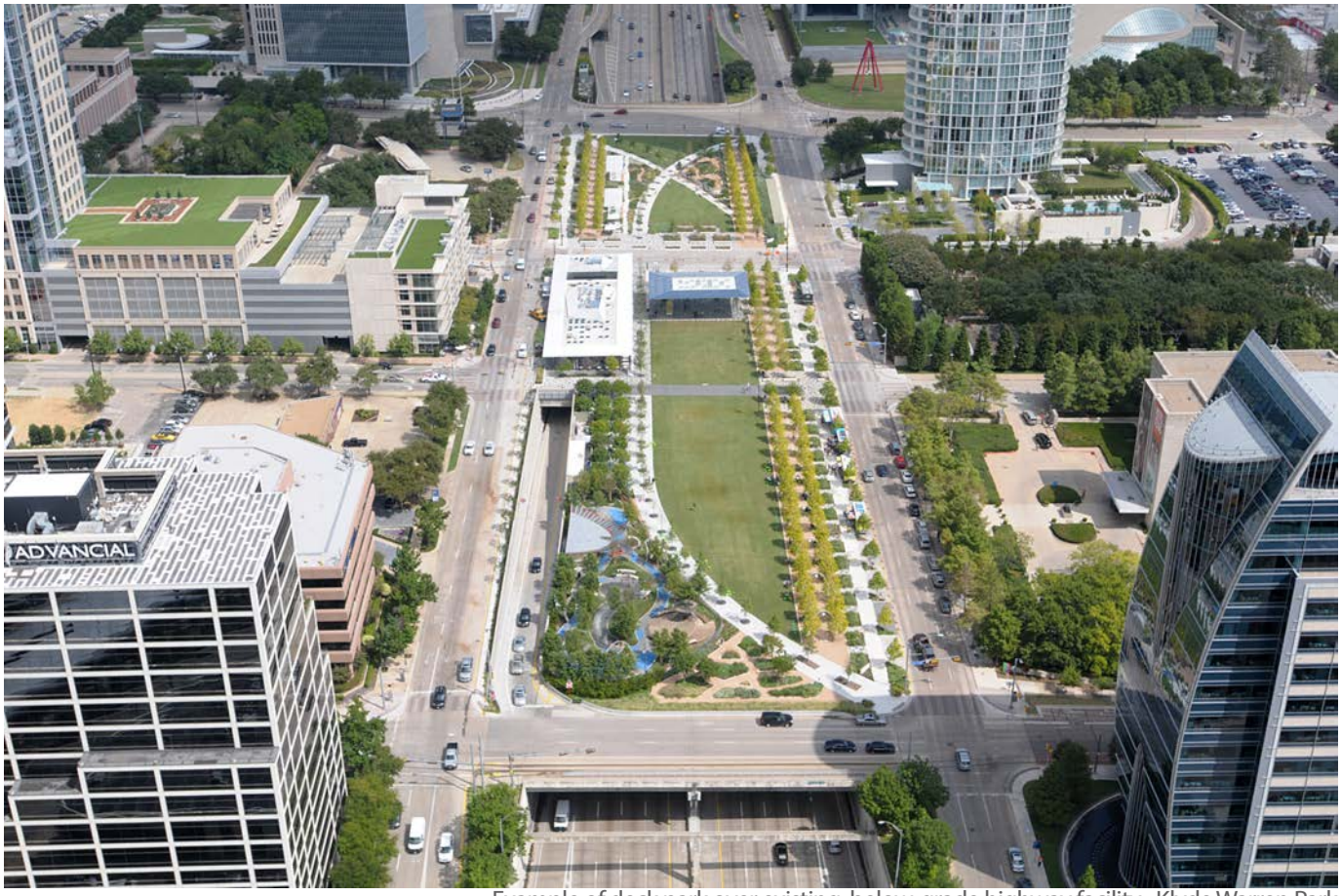



Google streetview screenshot of a typical rush hour condition on IH-345

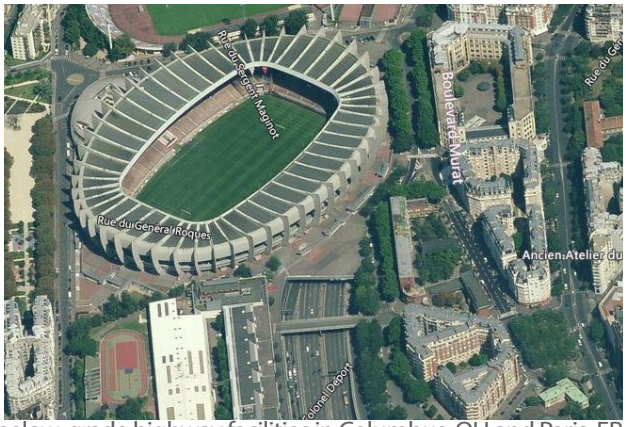
Danish architect and planner, Jan Gehl, introduced a concept that hierarchical road networks inevitably produce two conditions where some corridors becoming 'invaded' or congested while others are 'abandoned'. In essence, they are both failing at their fundamental purpose. Cities need transportation networks that emphasize abundant access rather than limited access and spread congestion over highly interconnected multi-modal and parallel networks rather than individual single-mode corridors, instilling choice and adaptability into the system.


Google streetview screenshot of a typical rush hour condition on Good Latimer Expressway

# THE TWO CHOICES: MITIGATION




Example of deck park over existing, below-grade highway facility: Klyde Warren Park

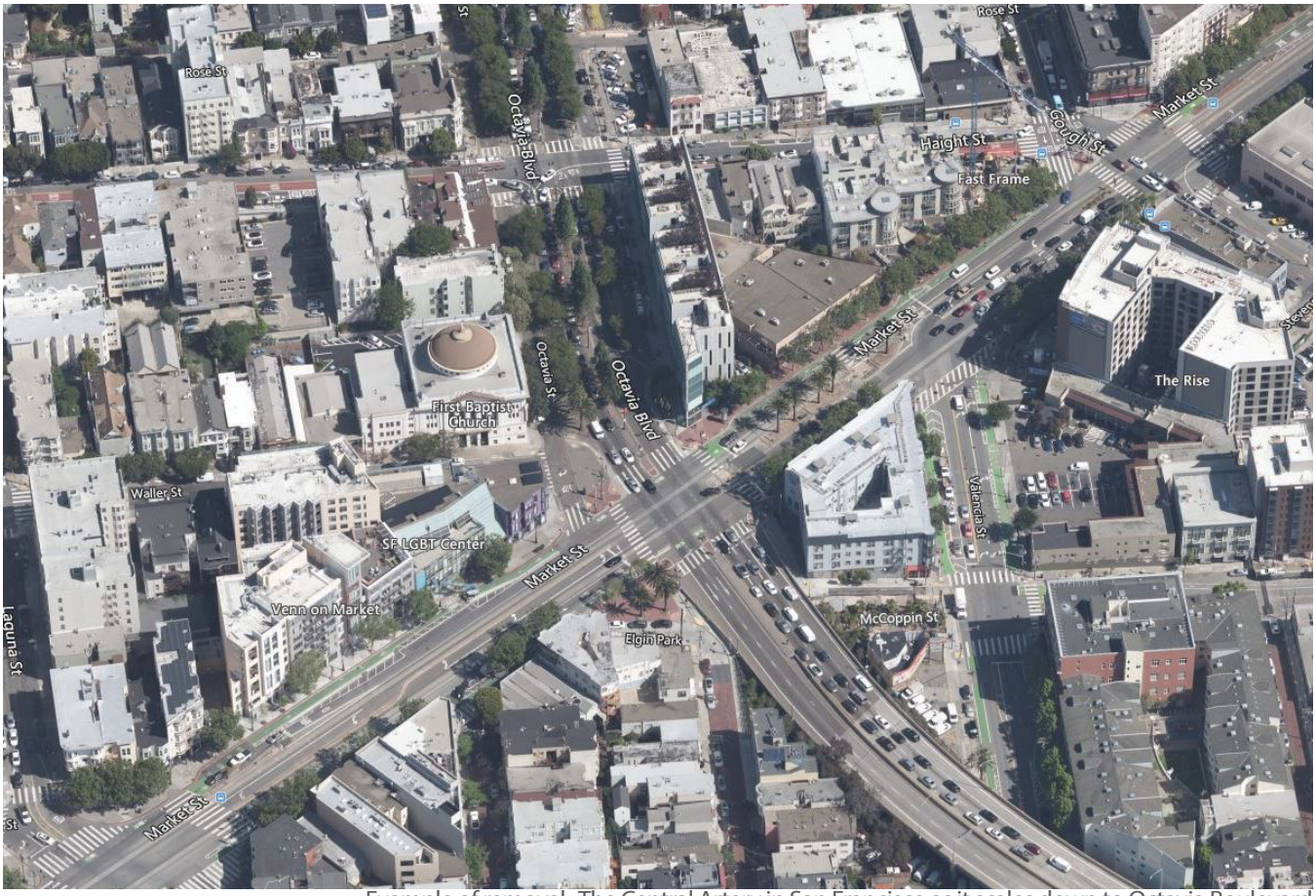



Examples of development over below-grade highway facilities in Columbus, OH and Paris, FR

## PROS & CONS OF MITIGATION:

- Generally higher cost
- Maintains regional transportation patterns
- Benefits localized to only immediate surrounding area
- Politically accommodating

# THE TWO CHOICES: REMOVAL



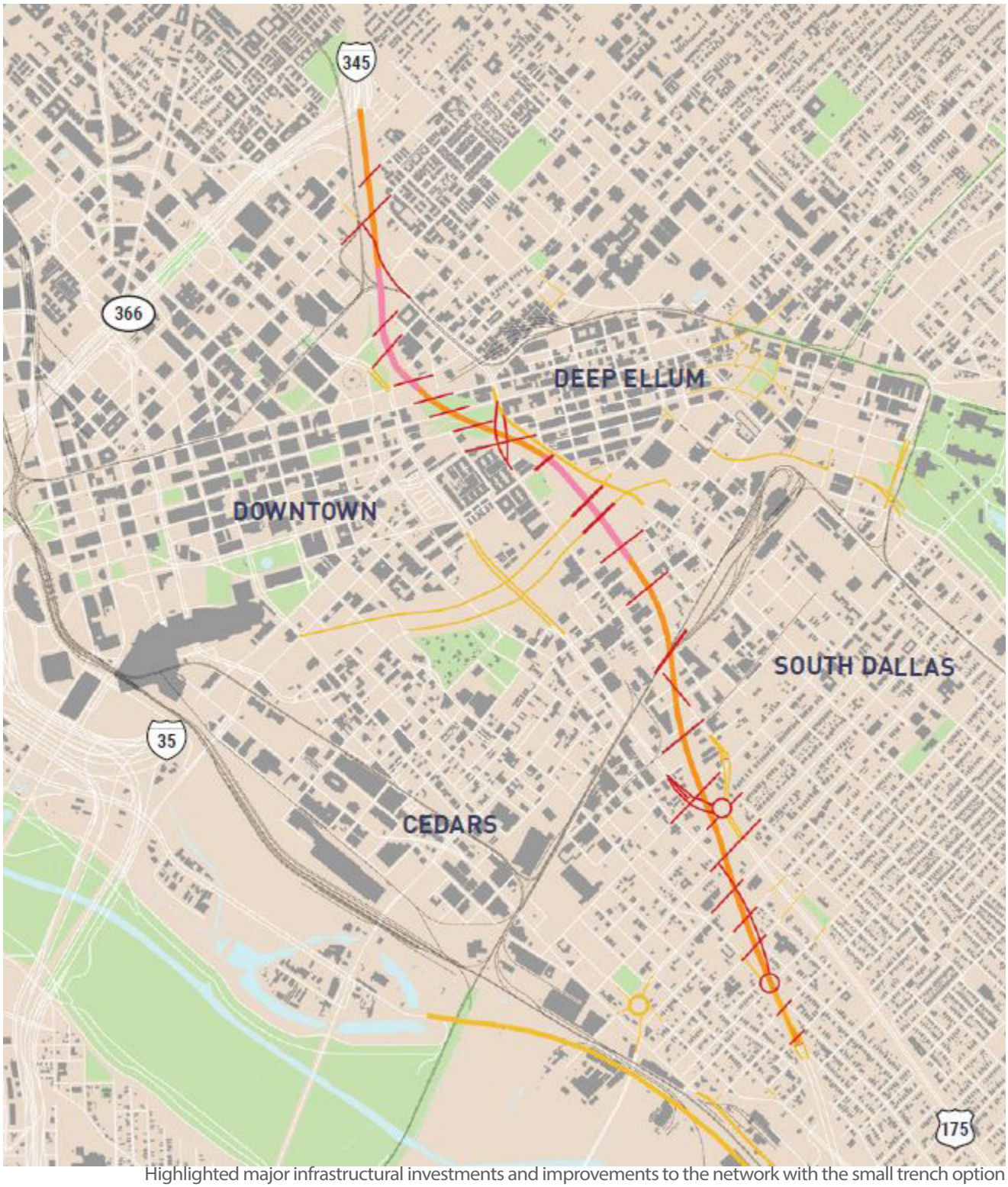

Example of removal: The Central Artery in San Francisco as it scales down to Octavia Boulevard

Example of removal: Multi-modal Octavia Boulevard (left) and the $1 billion Park East redevelopment plan in Milwaukee

# PROS & CONS OF REMOVAL:

- Greater political risk/reward
- More significant changes to broader transportation patterns
- Fundamental systemic change to city
- Reduces vehicle-miles travelled and emissions
- Greater return on investment, broader economic benefits

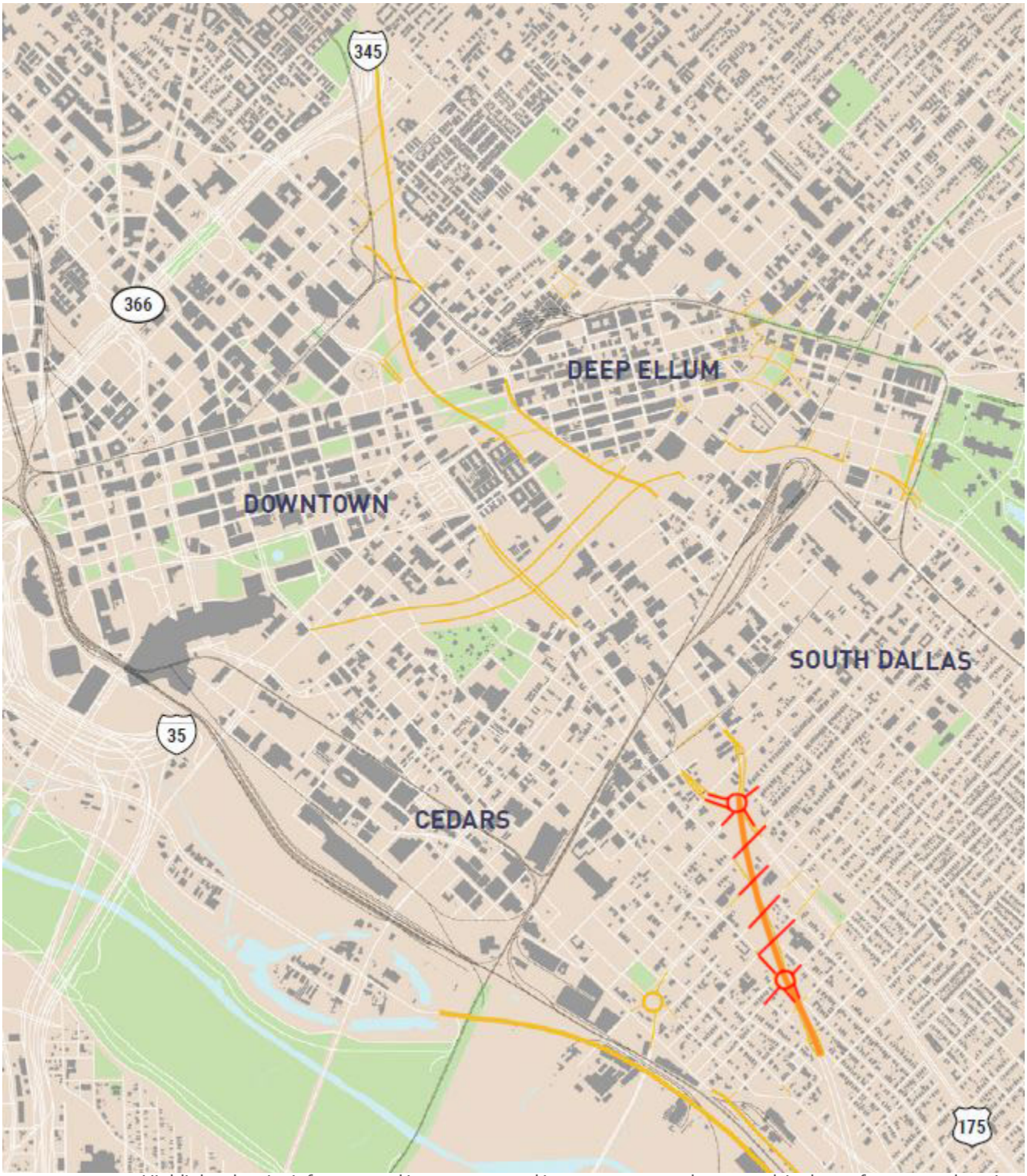
# SMALL TRENCH - TOOLE CAD PLAN




Highlighted major infrastructural investments and improvements to the network with the small trench option

1. Significantly greater expense as evidenced by highlighted changes.
2. Maintains trench within existing highway right-of-way to minimize negative impacts.
3. Extends trench to meet existing construction and extend benefits southward near Metropolitan Boulevard.
4. Connects Cesar Chavez Boulevard to Pearl Street to improve North-South Capacity.
5. Significant bridge reconstruction required to connect surface streets (red).

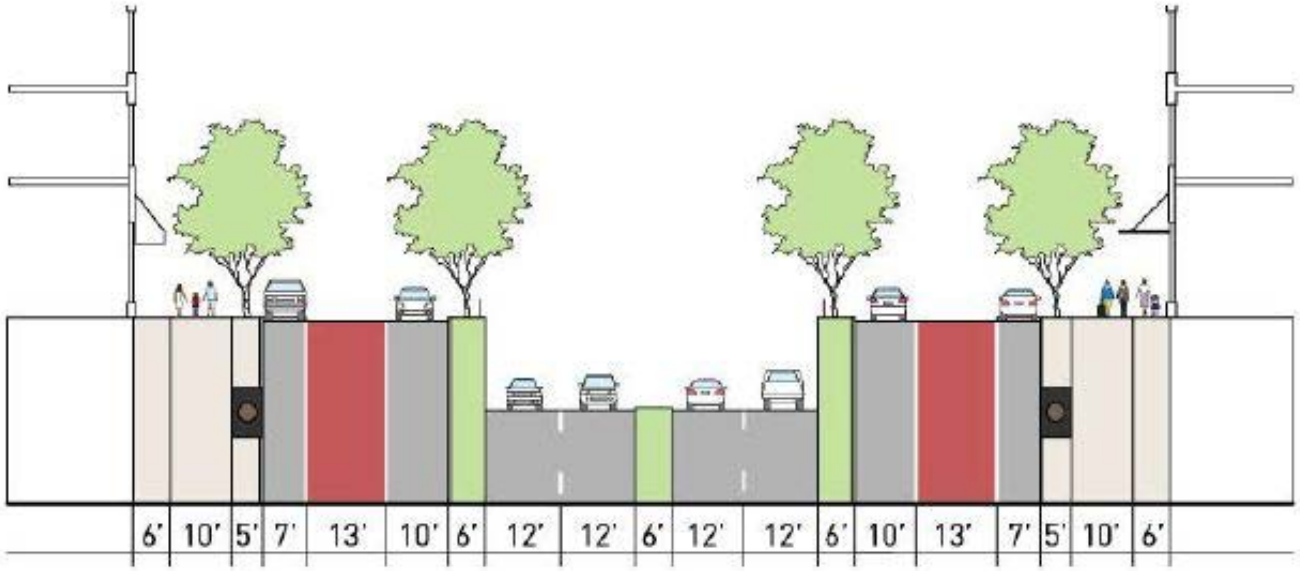
# SURFACE NETWORK - TOOLE CAD PLAN




Highlighted major infrastructural investments and improvements to the network in the surface network option.

1. Riverfront Boulevard connection more integral to surface network plan plus improves access to High Speed Rail Station.
2. Utilizes trench to extend improvements southward past MLK Boulevard and span connectivity to Cesar Chavez and Good Latimer junctions.
3. Connects Cesar Chavez to Pearl Street to improve North-South Capacity and Connectivity.
4. Significantly less reconstruction.

# SMALL TRENCH - TYPICAL CROSS-SECTION




Typical section of small trench -- in locations where there might be frontage roads, which are generally avoided in this option.
Courtesy: Toole Design Group

# EXISTING AVAILABLE CAPACITY STUDY

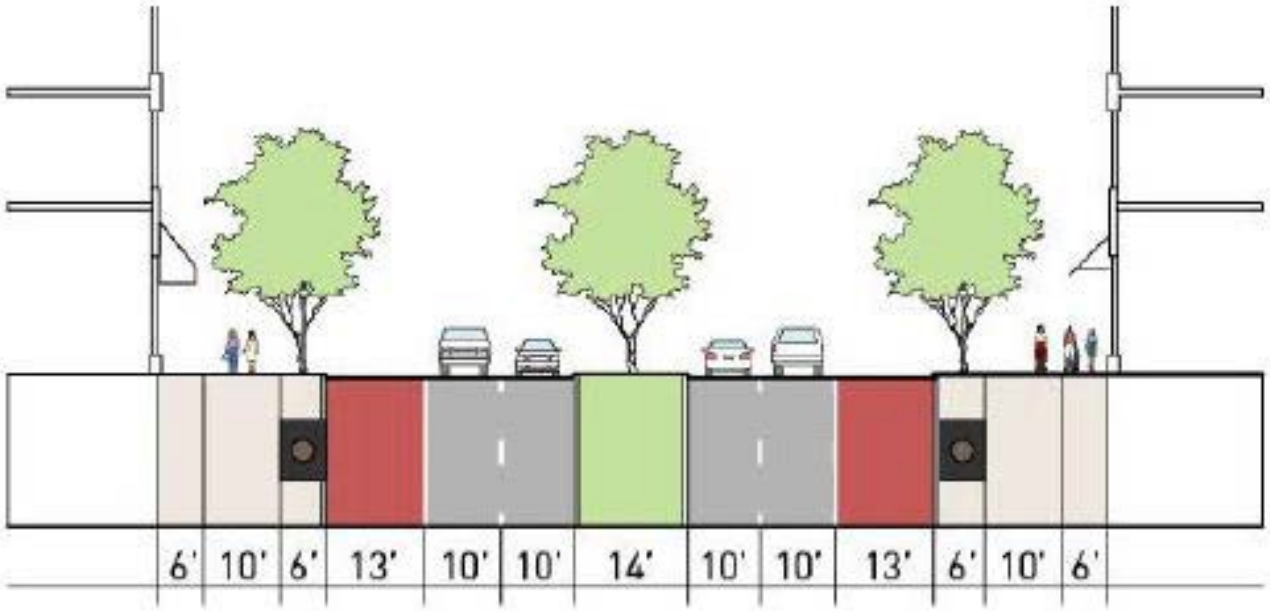
| Street | Existing (veh/hr) | Capacity (veh/hr) | Difference (veh/hr) |
|---|---|---|---|
| Cesar Chavez Boulevard | 1,200 | 3,440 | 2,240 |
| Harwood Street | 350 | 3,440 | 3,090 |
| Ervay Street | 350 | 3,440 | 3,090 |
| Lamar Street | 1,200 | 3,440 | 2,240 |
| **Total** | **3,600** | **18,920** | **10,660** |

The above calculations by Toole Design Group are used to compare highway capacity per lane to each of the proposed scenarios. Since IH-345 has eight travel lanes and if each lane has a maximum hourly capacity of 2,300, the highway has a theoretical maximum capacity of 18,400 veh/hr. However as the Toole Report states, the real maximum capacity while maintaining traffic flow is closer to 1500-1600 vehicles per lane per hour, while surface streets can handle up to 860 veh/ln/hr. Thus, at greater traffic levels, particularly during peak hours, IH-345 typically fails and becomes extremely congested. However, the purpose of this analysis is to demonstrate the available peak hour capacity given existing traffic levels on the city streets. Lastly, the Toole report included Good Latimer Expressway in the original table, but not in the available capacity calculations since it is not being activated in this plan. Therefore, it has been removed for this table.

| | |
|---|---|
| 8-Lane Highway Capacity: | 18,400 |
| New 4-Lane Highway Capacity: | 10,200 |
| Available Surface Network Capacity: | 10,660 |
| Total New Capacity: | 20,860 (+2,460) |

Notes:
* Maintains through traffic - so no need to re-route interstate traffic
* Does not require Riverfront connection, nor Good Latimer.

# SURFACE NETWORK - TYPICAL CROSS-SECTION




Typical street section of an improved "complete street" multi-modal boulevard which is pedestrian-friendly, encourages development along it, activates ground floor retail, and accommodates other active modes of transport such as dedicated transit or bike lanes. Courtesy: Toole Design Group

| Street | Existing (veh/hr) | Capacity (veh/hr) | Difference (veh/hr) |
|---|---|---|---|
| Good Latimer Expressway | 500 | 5,160 | 4,660 |
| Cesar Chavez Boulevard | 1,200 | 3,440 | 2,240 |
| Harwood Street | 350 | 3,440 | 3,090 |
| Ervay Street | 350 | 3,440 | 3,090 |
| Lamar Street | 1,200 | 3,440 | 2,240 |
| Riverfront Boulevard | 1,800 | 3,440 | 1,640 |
| **Total** | **5,400** | **22,360** | **16,960** |

| | |
|---|---|
| 8-Lane Highway Capacity: | 18,400 |
| Re-routing & Evaporation: | -2,208 |
| New Capacity Required: | 16,192 |
| Total New Capacity: | 16,960 (+768) |

Notes:

* This calculation does not account for potential mode shift as targeted by the City of Dallas' s Comprehensive Environmental and Climate Action Plan. Both concepts strive to create a network to accommodate peak hour traffic as it currently exists.
* Re-routes all interstate pass-through traffic around the city.
* While TxDOT has reported up to 24% of traffic is interstate traffic, passing through the city without stopping, this calculation uses a more conservative 12% for re-routing and 'evaporation'.

# MODIFIED TOOLE SCENARIO #1: SMALL TRENCH


1. Existing highway corridor remains in current alignment, but in narrower, depressed trench strictly for thru-traffic. Narrower trench recaptures more right-of-way than the wider trench from the CityMAP scenario and is easier to span. However, much of this land is still devalued by highway adjacency.

2. Trench begins south of Martin Luther King Boulevard in order to bring improvements and revitalization opportunities around a potential deck park to the area.

3. Local traffic (to the greater downtown area) is diverted from the highway onto certain under-capacity surface streets such as Good-Latimer and Cesar Chavez to reduce necessary volume of the trench - dividing local trips from regional and interstate trips.

4. Bridges retain cross-street connectivity. Adds additional bridges for other streets that were once blocked by the elevated highway.

# MODIFIED TOOLE SCENARIO #2: MAXIMIZED SURFACE NETWORK

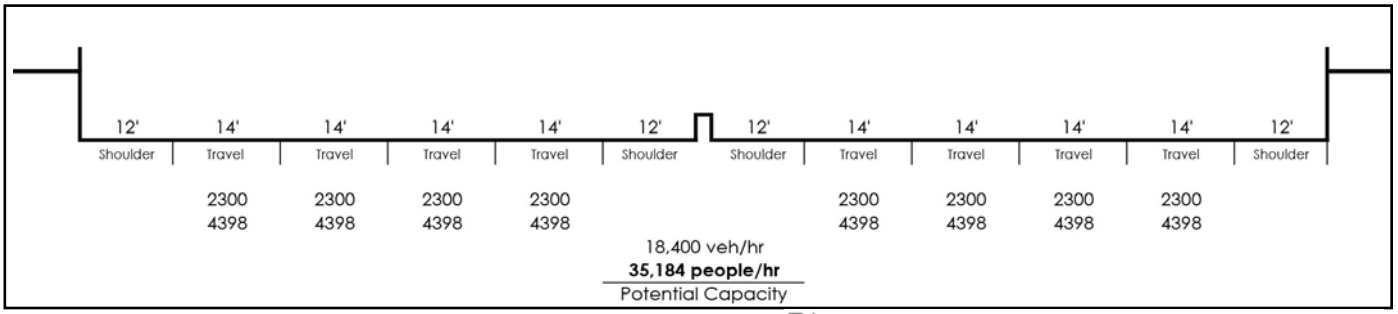

1. All traffic is diverted at multiple points along the former highway corridor to distribute traffic volumes broadly across a more robust North-South street network.

2. Surplus volume on surface streets is used to absorb diverted traffic while interstate traffic is diverted to outer beltway network (635 and Loop 9).

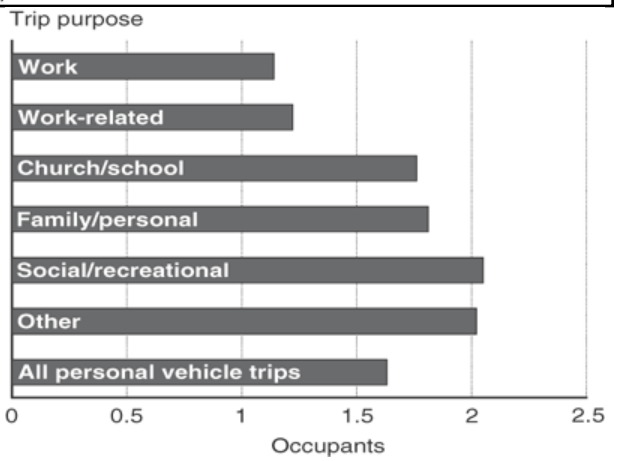
3. Interstate 45 is trenched under the Martin Luther King Jr. Boulevard area in order to bring improvements and revitalization opportunities to the area while also helping to transition the highway to the network of surface streets at Good-Latimer and Cesar Chavez Boulevards.

4. Intention is to increase North-South street grid capacity and connectivity AND former right-of-way land to maximize development potential for private investment and public good in order to reposition downtown Dallas as the center of gravity and economic growth for the city.

# MULTI-MODAL CAPACITY COMPARISON



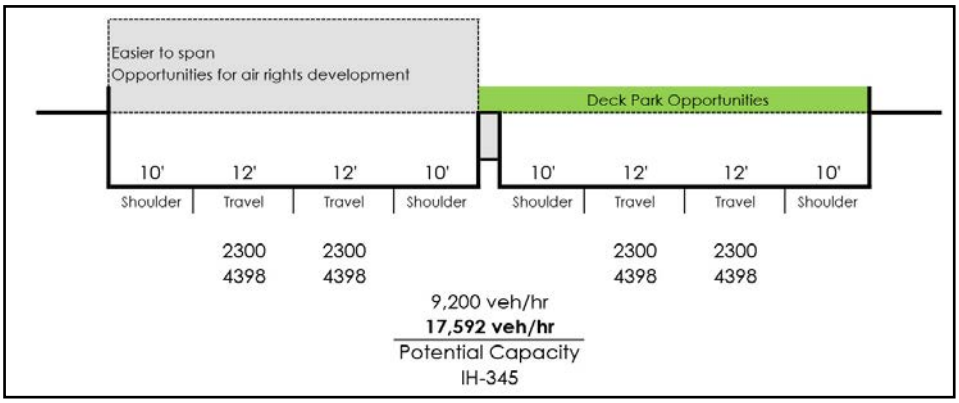

Many capacity calculations focus either strictly on number of vehicles or in multi-modal situations, total potential passenger capacity. In order to get to more accurate capacity numbers, average passenger count numbers were utilized as well as more realistic multi-modal projections provided the networks are designed to attract such passenger loads. While USDOT calculates average passengers per vehicle data per trip type (right), a similar calculation was created to approximate a conservative passenger load for all vehicular trips (below).



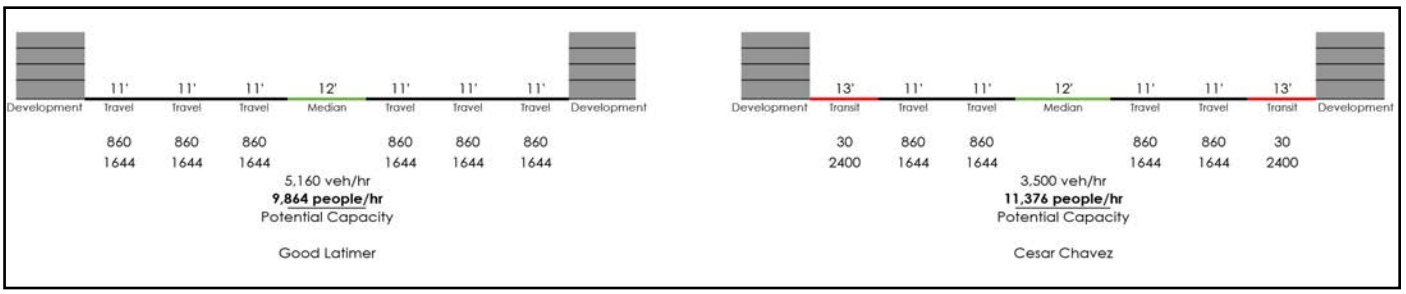

| | % of Car Trips | # of Passenger | Total Passengers |
|---|---|---|---|
| Single Occupant Vehicle | 43.40% | 1 | 0.434 |
| Vehicle Trips w/ Passengers | 53.60% | | |
| 2-Passenger Vehicle | 26.8 | 2 | 0.536 |
| 3-Passenger Vehicle | 13.4 | 3 | 0.406 |
| 4-Passenger Vehicle | 13.4 | 4 | 0.536 |
| | | | 1.912 |

Approximate Passengers per Vehicle

# TOOLE PROPOSAL 1: SMALL TRENCH & IMPROVED BOULEVARDS

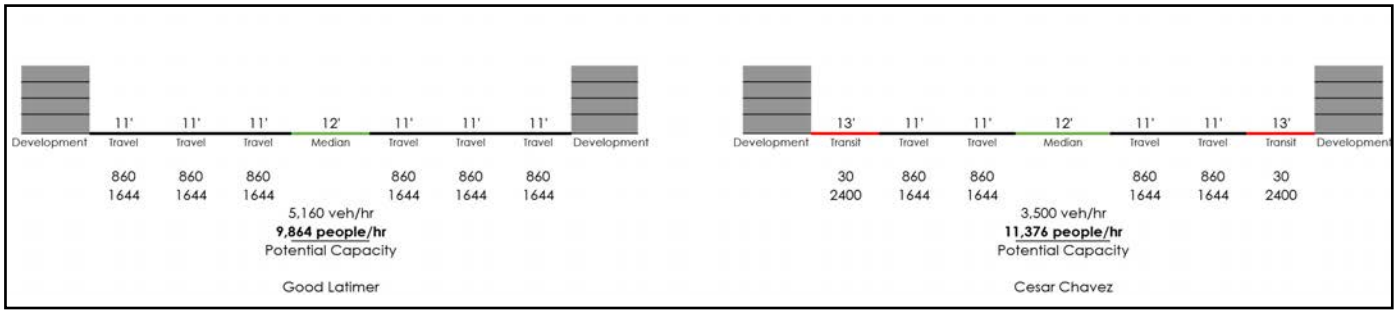


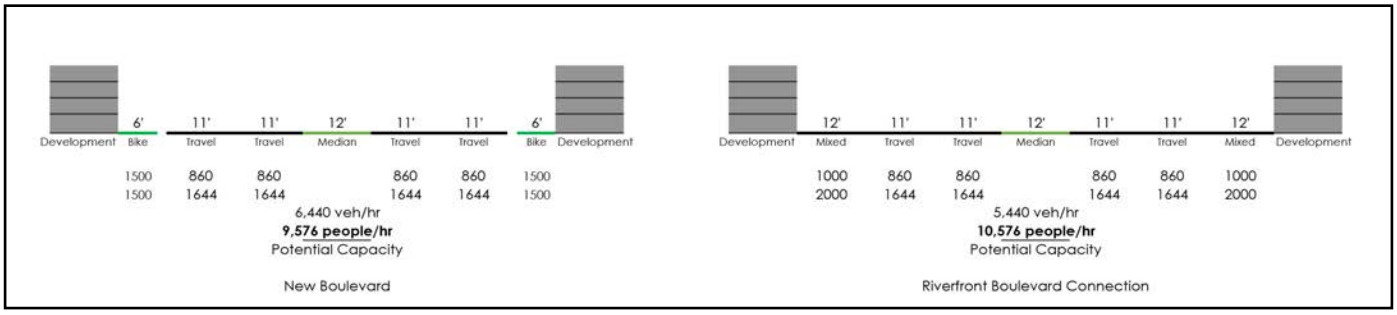

The first option instead of the full-sized eight lane highway trench is to break up the pass-through traffic from the locally-destined traffic. So as the pass-through traffic descends into a trench and continues past downtown Dallas, local traffic is redistributed onto Cesar Chavez and Good Latimer including potential high capacity transit lanes.




The second option where all traffic is redistributed onto a network of improved North-South surface streets is shown on the subsequent page. These streets can also potentially include dedicated multi-modal facilities as desired, which are recommended to accommodate the accompanying new density with safe, convenient short-trip infrastructure.

# MULTI-MODAL CAPACITY COMPARISON




# PEAK HOUR NETWORK CAPACITY BY OPTION

Large Trench Peak Capacity:

| | |
|---|---|
| Vehicles Per Hour: | 18,400 |
| Passengers Per Hour: | 35,184 |

Small Trench Peak Capacity:

| | |
|---|---|
| Vehicles Per Hour: | 17,860 |
| Passengers Per Hour: | 38,832 |

Surface Network Peak Capacity:

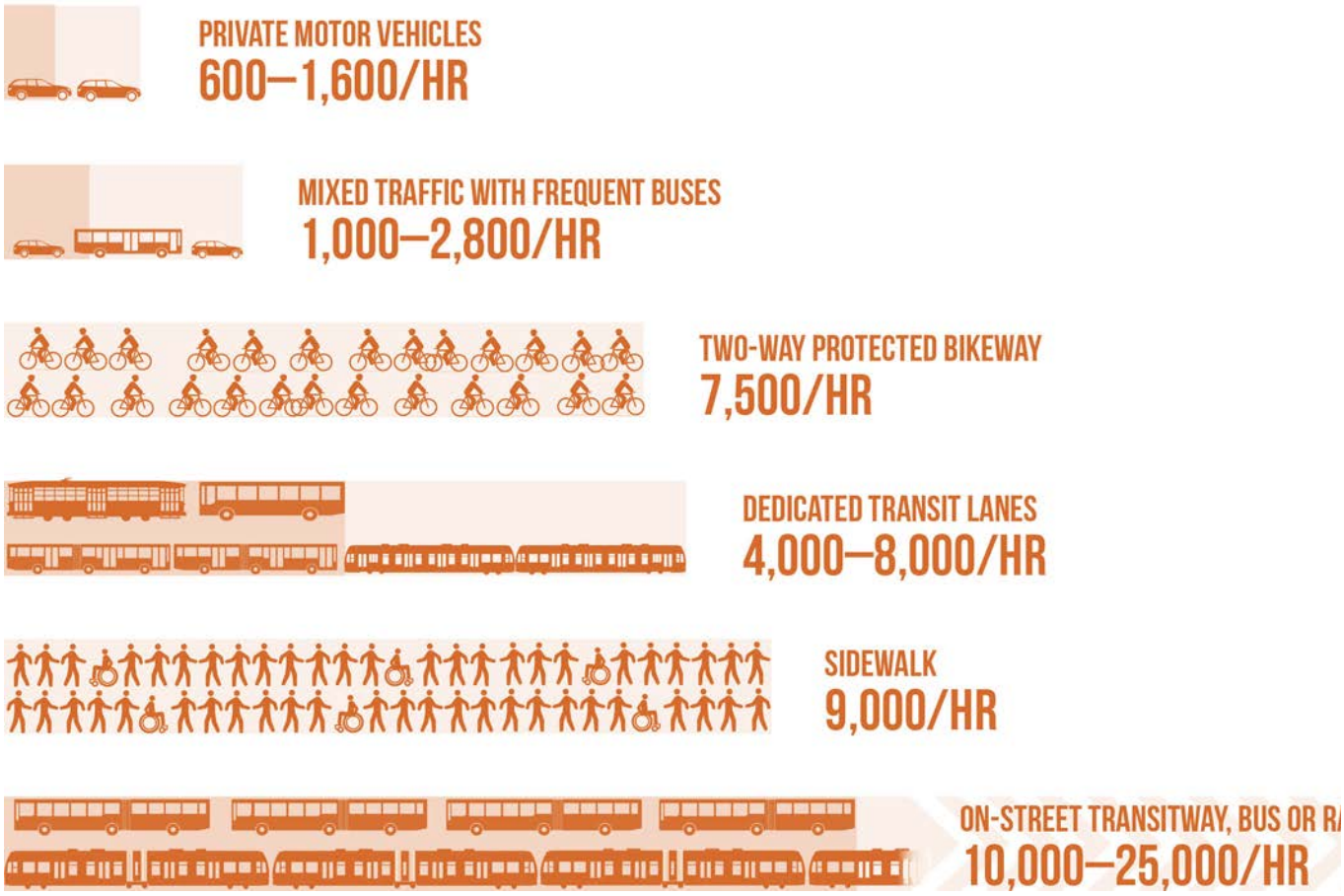
| | |
|---|---|
| Vehicles Per Hour: | 20,540 |
| Passengers Per Hour: | 41,392 |

Infrastructure should be designed for the purpose and destination of trips while serving and not undermining the value and economy of cities. As will be addressed in subsequent pages (as well as in the INVADED/ABANDONED section on page 31), the existing surface network is underutilized due to problems with the network. These are not useful connections as currently designed and therefore not part of "the useful network." By better designing networks to allocate local traffic to local destinations and regional/interstate (or long-trip) traffic to large, long-distance infrastructure, both the surface network and the small trench option can accommodate peak hour vehicular traffic while encouraging more multi-modal trips.

*Notes: Calculations use the most conservative possible interpretations of capacities. The calculations also:

- do not realize the city's goal of modal shift from 88% to 62% single occupant vehicles
- do not account for potential reduced vehicle miles travelled (VMT) per capita
- do not account for potential re-routing of regional traffic (in the surface network option)
- do not account for potential traffic 'evaporation'
- do not account for possible increase in pedestrian trips
- only factor maximum capacity of scenarios rather than hypothetical future traffic projections which are not considered to be factually supported nor ultimately desirable for the city.

# TRAFFIC CAPACITY PER LANE BY MODE

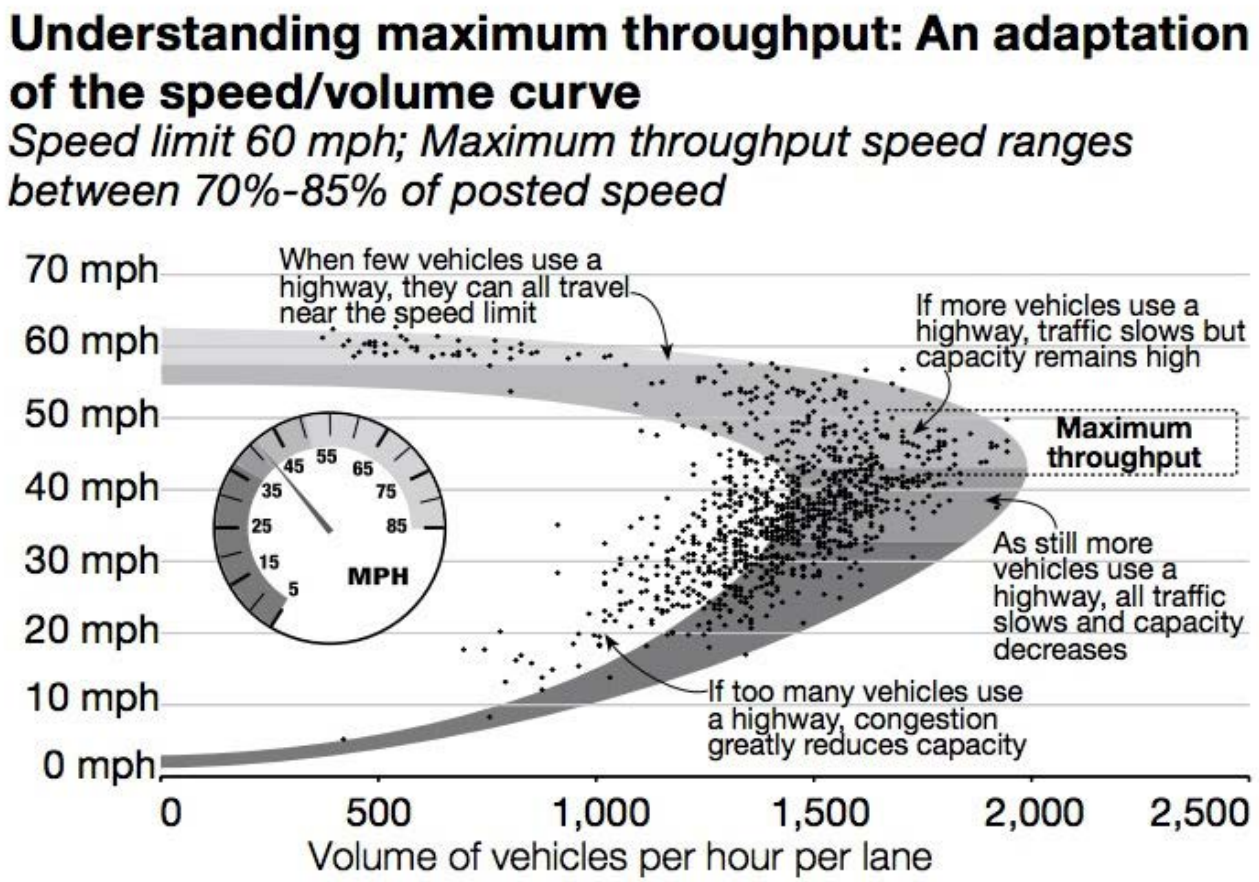



Graphic created by National Association of City Transportation Officials (NACTO)

Conventional traffic capacity is typically measured only by the amount of cars per travel lane. Instead, the National Association of City Transportation Officials (NACTO), of which the city of Dallas is a member, suggests instead to measure the performance of a transportation facility by the number of total people that can be moved safely and efficiently. As is written in their Transit Street Design Guide, doing so "presents a more complete picture of how a city's residents and visitors get around." Furthermore, for the city to meet its modal split goal of reducing single occupancy vehicle trips from 88% to 62% of all trips, the city must 1) add both jobs and housing density in and around downtown, and 2) significantly increase the amount of infrastructure dedicated to active transportation such as walking, bicycling, and transit.

This graphic is included to demonstrate that the calculations on the previous page are even more conservative in terms of the capacity of travel lanes, with vehicular capacity leaning to the absolute maximum theoretical capacity while significantly reducing the possible passengers moved by transit and bicycle facilities. While NACTO suggests vehicle lane capacity as a range between 600-1600, these calculations follow the Toole report which used 860 for city thoroughfares and 2,300 for highway lanes. Furthermore, while NACTO suggests dedicated transit lanes can move up to 8,000 passengers, bike lanes can move up to 7,500 people, and mixed traffic lanes can move up to 2,800, the calculations on the previous page use 2,400, 1,500, and 2,000 respectively for two reasons, 1) this is still a car-dependent region and such capacities are unlikely even with the proposed significant increase in density, and 2) be as conservative as possible in order to prove that these options can handle the traffic loads with confidence.

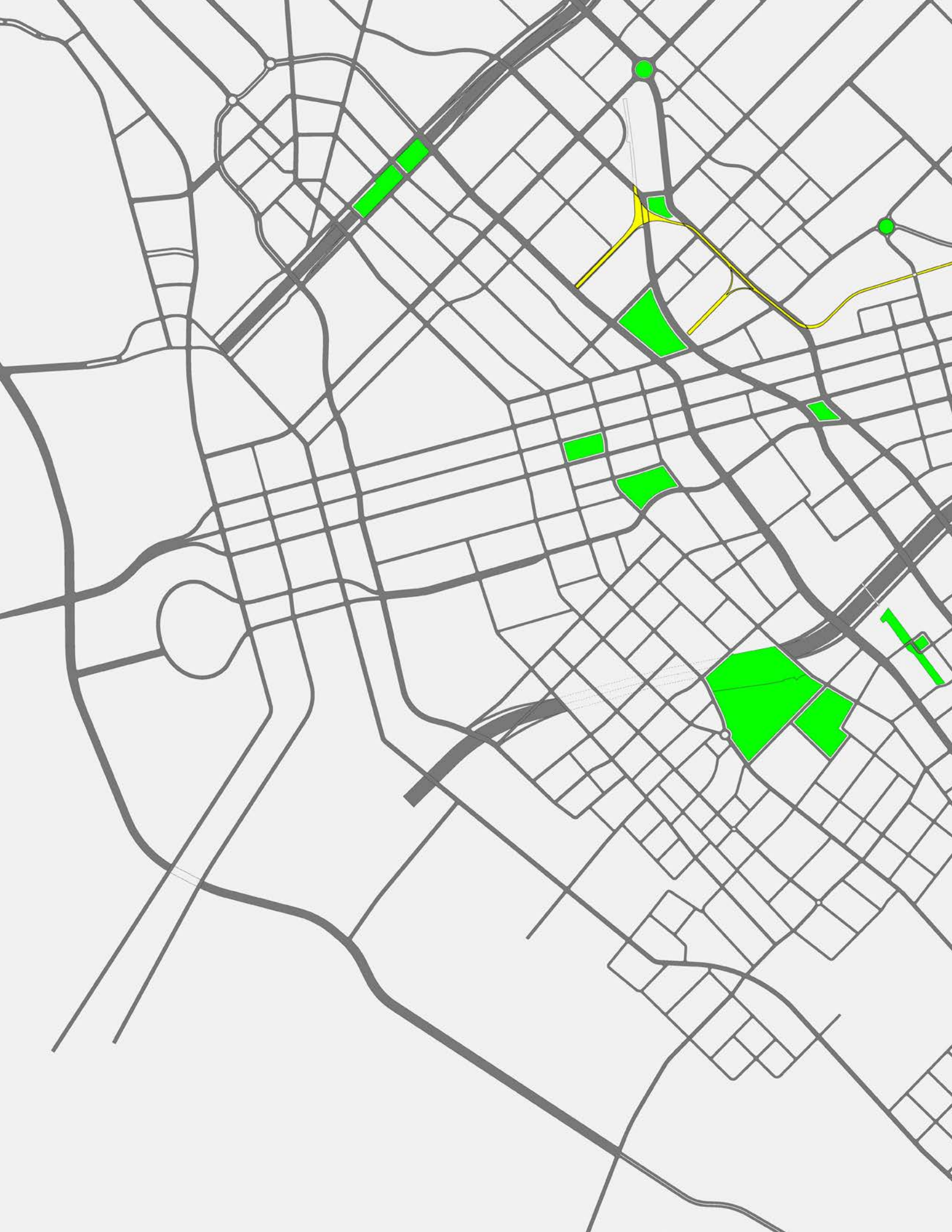
# FUNCTIONAL VS. THEORETICAL HIGHWAY TRAFFIC CAPACITY




Data Source: Washington State Department of Transportation (WSDOT) Northwest Region Traffic Office from their "Comprehensive Annual Analysis of Multimodal State Highway System Performance

While the Toole report does include the above graphic, it is worth reiterating that the calculations in both the Toole report (detailed on pages 36-37 of this report) and by Space Between Design Studio (pages 40-41) use the maximum theoretical capacity of cars per hour per travel lane of 2,300. However, functionally when travel lanes experience that much volume, traffic invariably slows and contracts like an accordion, and thus, the functional capacity drops significantly below the theoretical capacity. Maximum functional capacity, as illustrated above by the Washington state DOT (WSDOT) is likely closer to 1,600-1,800 while still able to move at reasonable highway speeds of 40-50 mph. Congestion is caused by funneling too much traffic onto limited access facilities that cannot scale to meet the volume causing delay. Furthermore, having too many interchanges (or confluences) in close proximity such as what occurs in and around downtown Dallas leads one choke point to back into another causing a chain reaction and delay onto all approaching connections.

Again, the maximum theoretical capacity of highway lanes was used in the calculations to ensure the two proposed options could still manage the maximum amount of trips, which as demonstrated on the previous pages, both options can do so.



# Economic Factors

# CityMAP ECONOMIC DEVELOPMENT PROJECTIONS

**I-345** *[M]Modify, [R]Remove, [B]Below Grade*

**NET NEW PROPERTY VALUE**

$1.4B[M] | $2.5B[R] | $1.5B[B]

**NET NEW REVENUE TO CITY**

$51M[M] | $80M[R] | $50M[B]

**COST RANGE**

$ ⟷ $ < $100M[M] | $100-499M[R] | $500-999M[B]

**POPULATION GROWTH**

6,000[M] | 12,000[R] | 4,400[B]

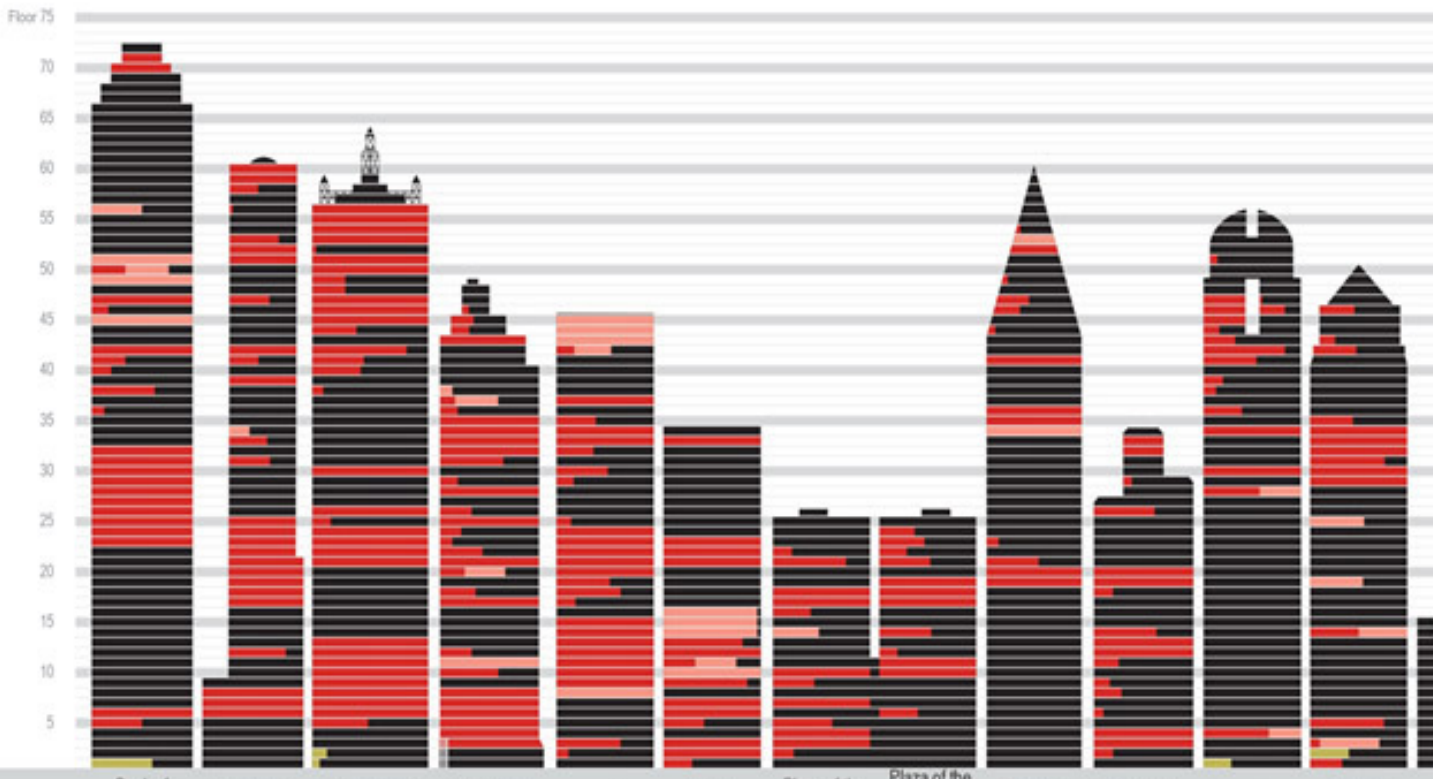
**EMPLOYMENT GROWTH**

23,000[M] | 40,000[R] | 29,000[B]

Table from TxDOT's CityMAP report showing economic development potential for the three CityMAP scenarios for IH-345

## Dallas Skyline Review

An analysis of the Dallas office market




| | Bank of America Plaza | Comerica Bank Tower | Renaissance Tower | 1700 Pacific Avenue | Lincoln Plaza | KPMG Centre | Plaza of the Americas - North Tower | Plaza of the Americas - South Tower | Fountain Place | 2100 Ross Avenue | Chase Tower | Trammell Crow Center |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RBA (s.f.) | 1,865,168 | 1,530,957 | 1,729,294 | 1,340,481 | 1,113,575 | 827,704 | 562,500 | 536,344 | 1,200,266 | 866,709 | 1,296,407 | 1,128,331 |
| Percent leased | 76.7% | 69.0% | 59.3% | 60.6% | 70.8% | 71.6% | 77.7% | 83.6% | 87.9% | 67.5% | 85.0% | 81.0% |
| Direct rent (FS) | $21.10 | $21.95 | $16.75 | $15.30 | $25.00 | $20.00 | $21.75 | $21.75 | $25.50 | $24.50 | $32.50 | $32.00 |
| Year built/ renovated | 1985 | 1987 | 1972 / 1991 | 1983 / 2011 | 1984 / 2009 | 1980 / 1997 | 1980 / 1992 | 1980 / 1992 | 1986 / 2013 | 1982 / 2006 | 1987 | 1984 / 2013 |

# CityMAP ECONOMIC ANALYSIS CRITIQUES

The CityMAP economic development scenarios related to the IH-345 options for the downtown vicinity are overly focused on commercial development. The need, however is housing. As shown below by Jones Lang LaSalle's (JLL) office vacancy report, downtown commercial properties have significant vacancy and new office space is not yet in demand. While this data is somewhat dated (2017), the overall conditions are believed to be relatively unchanged.

Housing is needed, particularly mixed-income housing near jobs and transit, which are both in greatest abundance in downtown Dallas moreso than anywhere else in the region. Housing growth and repopulation of the area will, in turn, drive demand for commercial development and job growth, both for service industry jobs and commercial growth sectors where companies are looking to relocate into high quality, amenity-rich downtown environments.

Also, the construction cost multiplier utilized in the economic development calculations is believed to be too low at $110 per square foot. Development costs as well as typical assessments of new development are significantly higher, likely between $200 and $300 per square foot, which suggests the economic development and new revenue potential to the city is much higher than what CityMAP suggested.

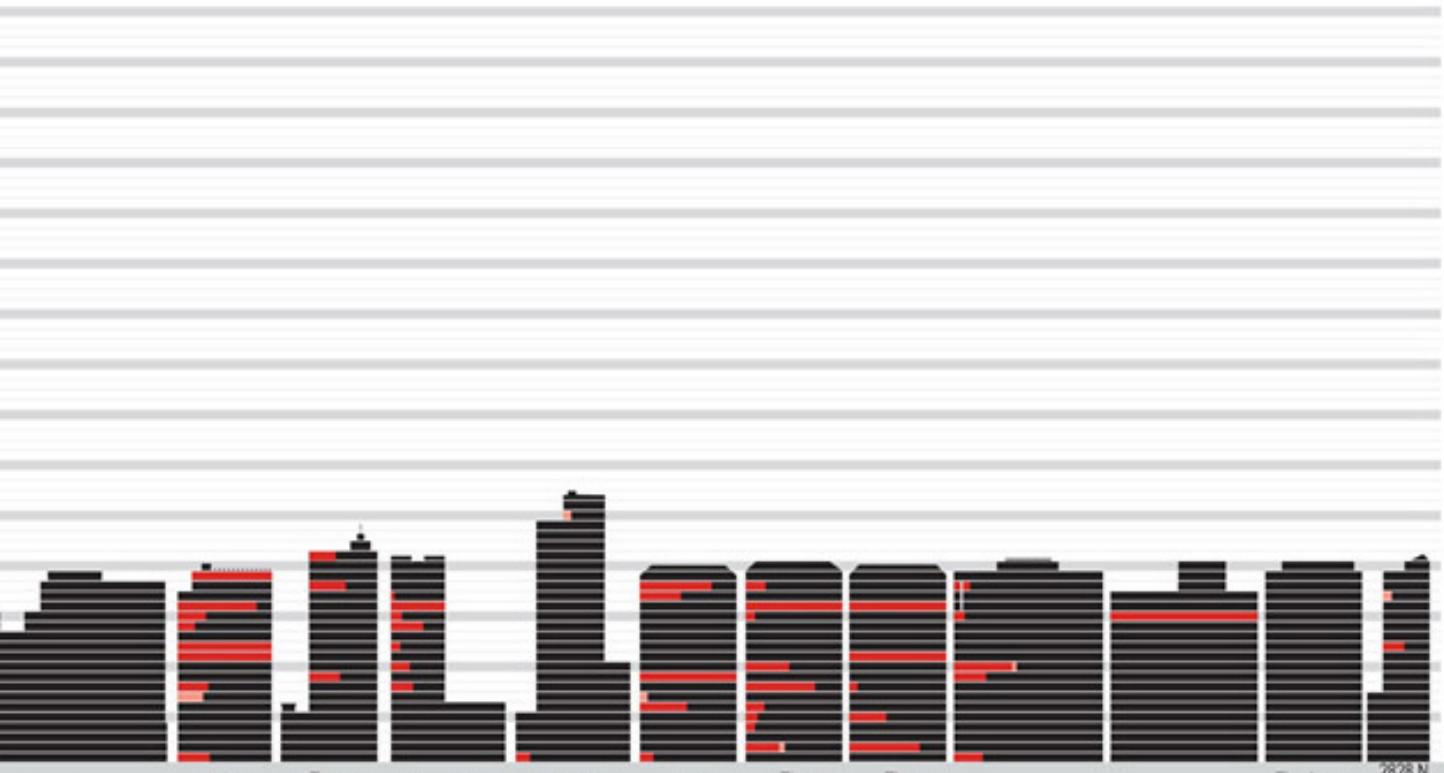
* See pages 63-67 for more information.

ease vacant floor

Parking, Other unusable space

Retail

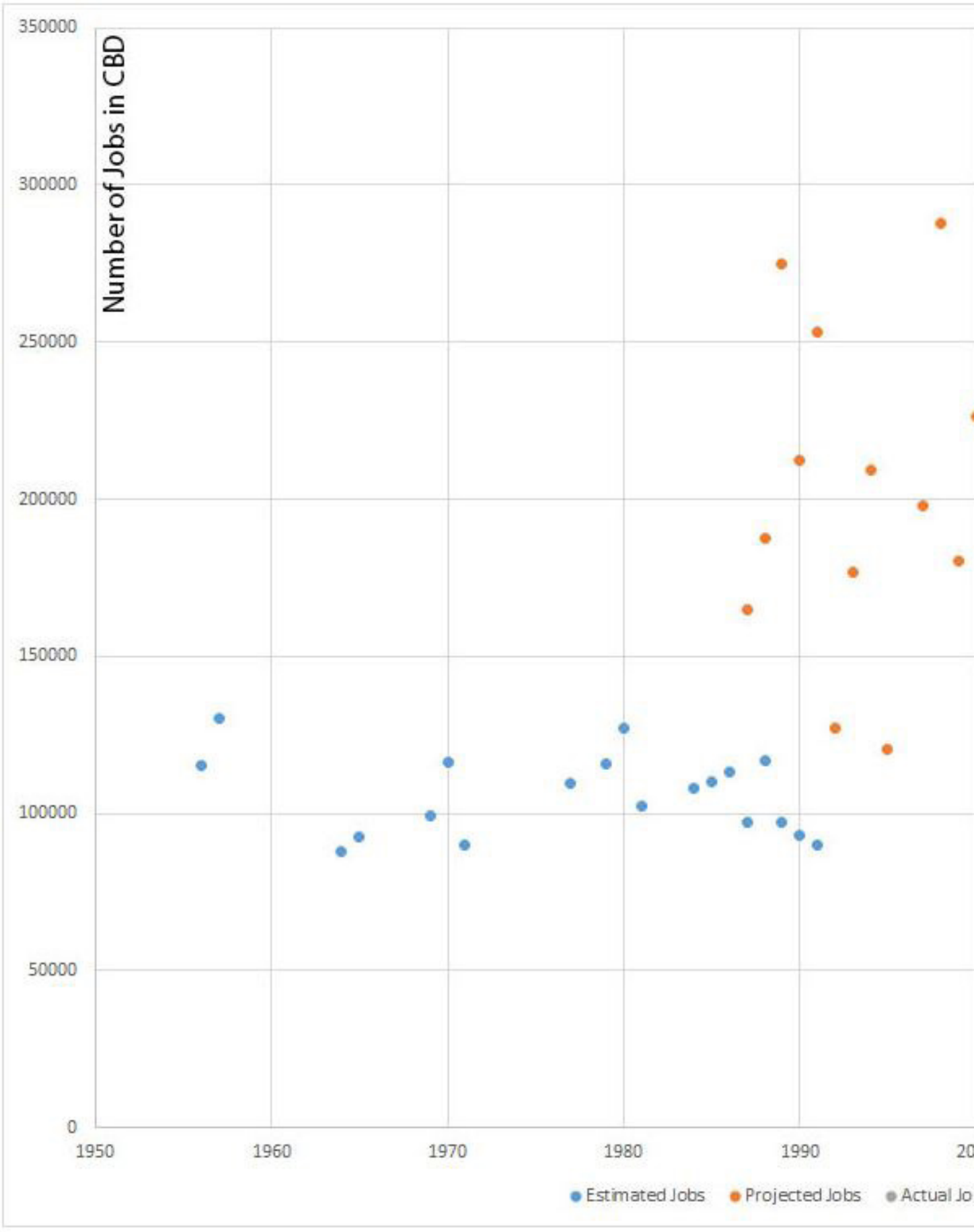
Dallas' Skyline includes the best-in-class office buildings located in the urbanized core that meet one or more of the following criteria: larger than 200,000 total square feet, built or significant renovations since 1985, high-profile location, recognized-tenant profile and/or architectural significance.

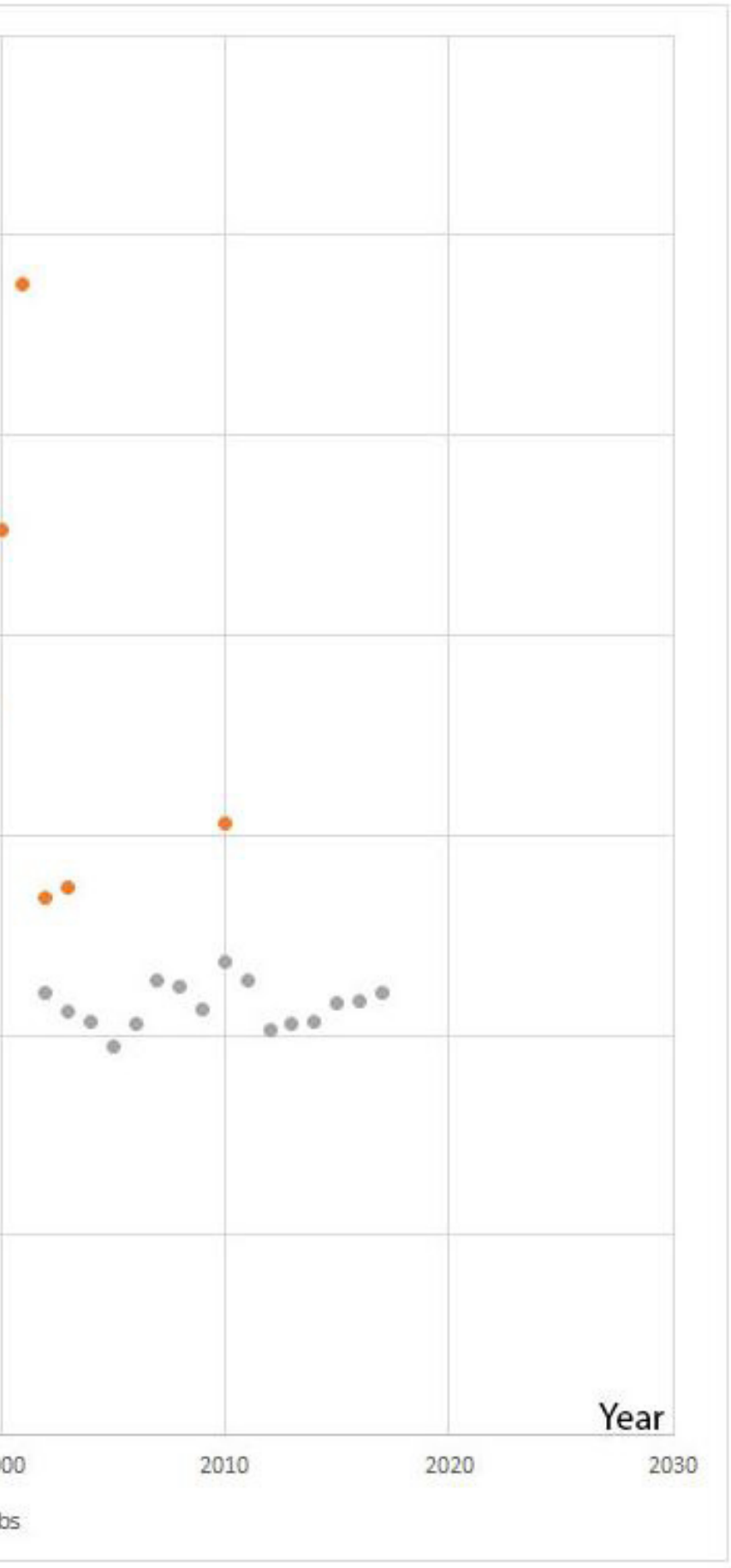


| One Arts Plaza | Park Seventeen | Texas Capital Bank Building | 2100 McKinney Avenue | Saint Ann Court | The Crescent | The Crescent - 200 | The Crescent - 300 | Rosewood Court | One Victory Park | The Jones Day Building | 2828 N Harwood Street - Phase IV |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 530,236 | 361,524 | 442,355 | 351,858 | 314,279 | 372,260 | 390,305 | 372,260 | 405,291 | 436,049 | 209,910 | 220,661 |
| 100.0% | 65.1% | 95.0% | 79.4% | 98.9% | 93.9% | 94.0% | 91.2% | 93.7% | 93.4% | 100.0% | 97.7% |
| $30.00 | $36.50 | $36.00 | $35.00 | $35.65 | $43.00 | $43.00 | $43.00 | $37.75 | $33.50 | $34.90 | $32.45 |
| 2007 | 2010 | 2008 | 1999 | 2009 | 1985 | 1985 | 1985 | 2008 | 2008 | 1999 | 2000 |

Jones Lang LaSalle's 2017 Skyline Report on Commercial Office Vacancy

# HISTORIC JOB COUNTS IN DALLAS CENTRAL BUSINESS DISTRICT






The chart to the left was created using the data in a journal article written by a Harvard Professor, John Kain, who compared historic downtown job estimates and counts to the various studies of future job projections by various entities.

Shown in blue are the estimated historic job counts cited in Kain's analysis. These are considered estimates of historic job counts because the numbers are very round and believed to have been relatively rough estimations. In Orange are all of the projected jobs in the various studies Kain cited that were used to justify both transit and highway expansion projects.

In gray, are the estimated jobs in downtown Dallas for each year in the United States Census Bureau's Longitudinal Employer-Household Dynamics data tool OnTheMap. This data was researched and this chart created for the purpose of this document.

All of the studies predicted jobs would inevitably increase in downtown Dallas, but each predicted that jobs would go up even further if 1) rail transit was built or 2) highways were built, but that jobs would go up the most if 3) both highways and rail transit was built. Both have since been built.

Meanwhile, the OnTheMap data from 2002-18 suggests that downtown jobs have been roughly flat since the 1950's. Considering Dallas population and geographic growth patterns, downtown Dallas jobs likely climbed and peaked in the 1950's at which point they seem to have flatlined.

While Kain's analysis was focused on the false or never materialized projections used to justify rail expansion, considering the city was built and grew around both intercontinental rail and local streetcar networks, it was the highways that 1) were projected to create increased job growth, 2) are the primary cause of regional sprawl, and 3) are likely the cause of the lack of job growth despite significant regional job and population growth since the stagnation began precisely when the highways were introduced into downtown Dallas.

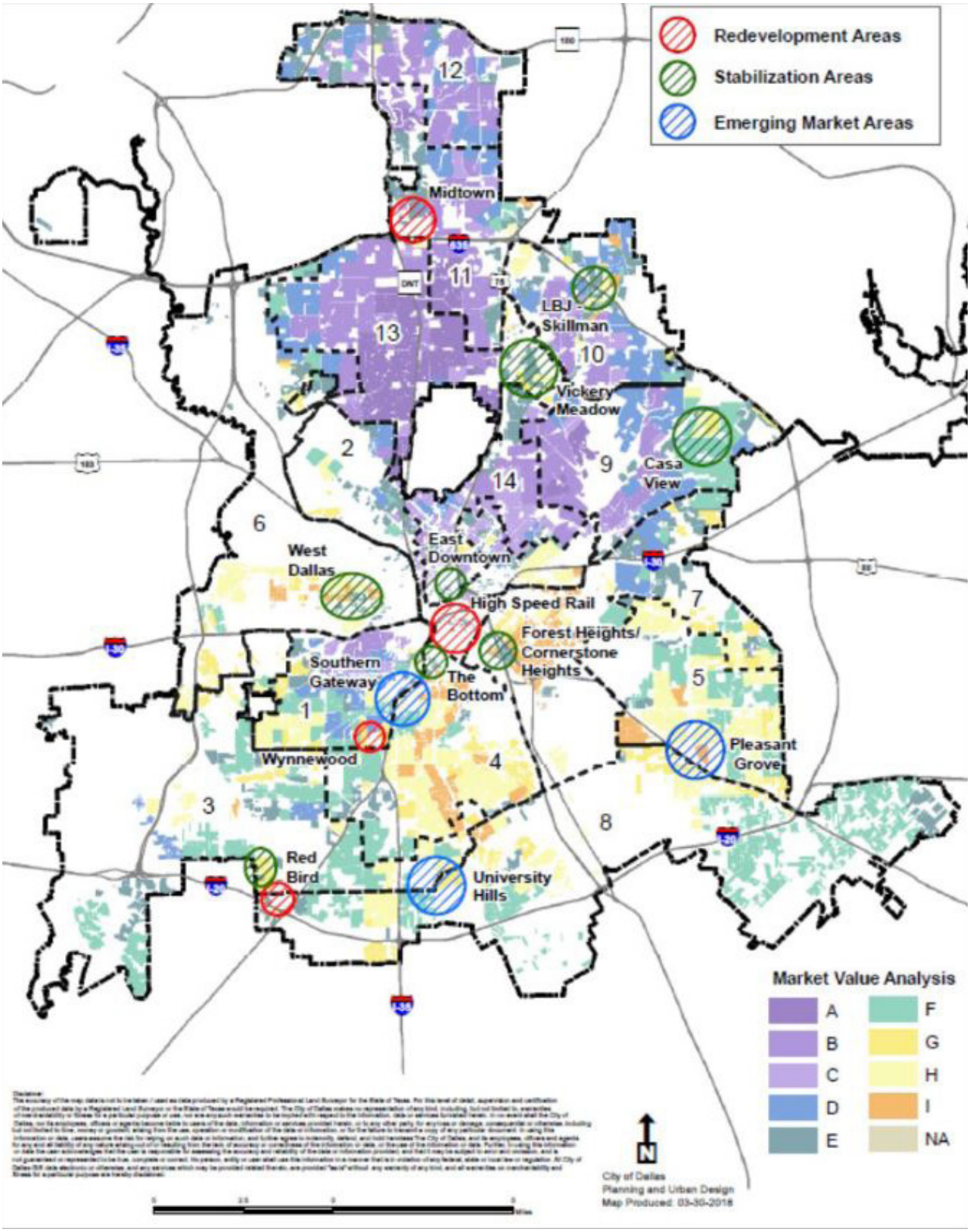
Sources:
"Deception in Dallas: Strategic Misrepresentation in Rail Transit Promotion and Evaluation" as published in the Journal of the American Planning Association in Spring 1990 edition.

*John Kain was chair of the Department of City and Regional Planning and taught in the Economics Department at Harvard University.*

https://onthemap.ces.census.gov/

# CITY OF DALLAS COMPREHENSIVE HOUSING POLICY

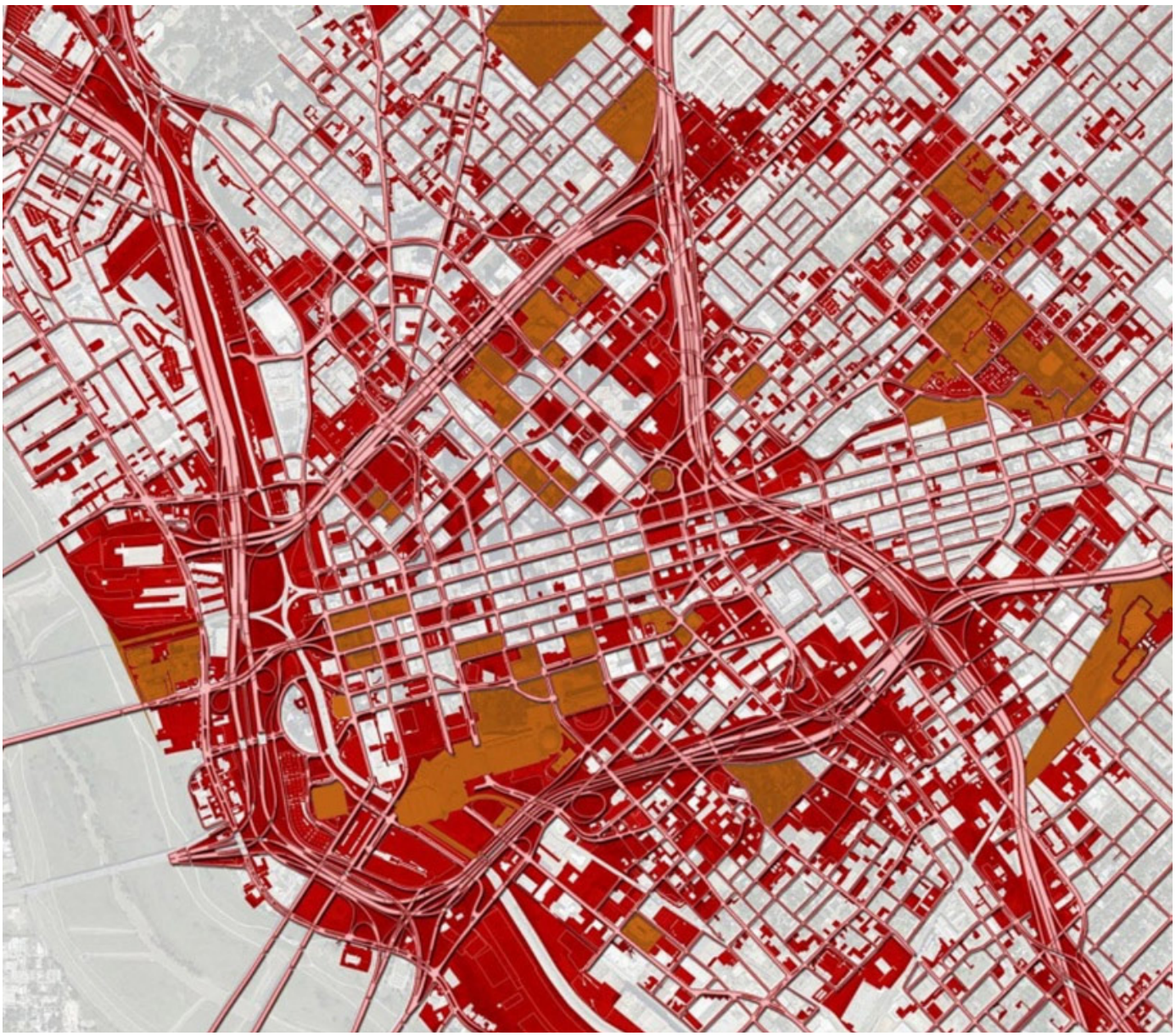
In August of 2020, the Dallas City Council passed a Comprehensive Housing Policy, which targeted areas with strategic and calibrated policies to help encourage housing growth and neighborhood stabilization. There are two areas identified in the Policy that fall within the impact area of 45-345 Redevelopment Corridor Scenarios. Those areas are East Downtown and the Forest District, around the historic Forest Theater on MLK Blvd. Both of these areas are highlighted as Stabilization Areas - which are identified for the risk of displacement based on "known market conditions and upcoming redevelopment projects."



Stabilization Areas are also identified as areas for Incentive Zoning, which is a tool cities use to offer increased height or density in exchange for affordable housing units. While delivering more affordable and workforce housing units is necessary to repopulate these areas as well to deliver these kinds of units in areas of high opportunity, challenges exist in the market that incentive zoning may not be enough to overcome for the city to achieve its goals. Simply, land costs are too high and rents are too low, which makes development difficult. The market-rate rents are unlikely to help subsidize affordable units without there being more land and more value in the land.

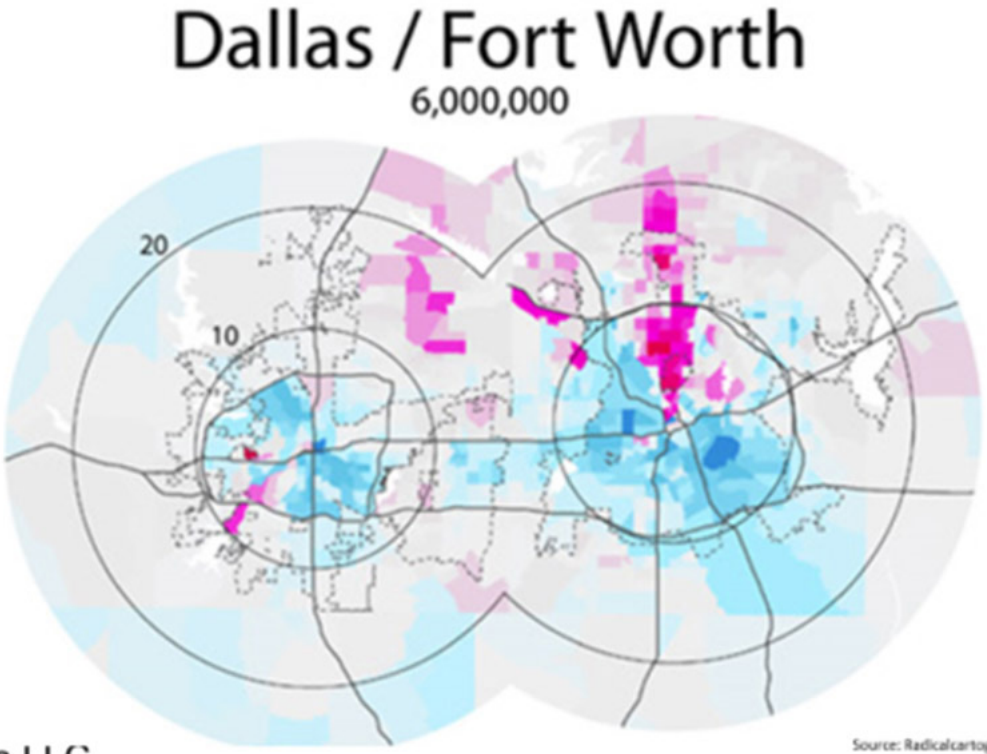
While there are several development projects in the pipeline in these areas, the market has continued to lag and it is likely that incentive zoning will not be enough to encourage the construction of the needed number of units at scale. While the city has a target of 20,000 new units, it is possible that the 45/345 corridor could help deliver a large portion of these needed units. Lastly, it is important to note that these areas in need of stabilization were destabilized by the introduction of the freeways. Based on the figure below, it is the location of the freeways that is depressing potential development.

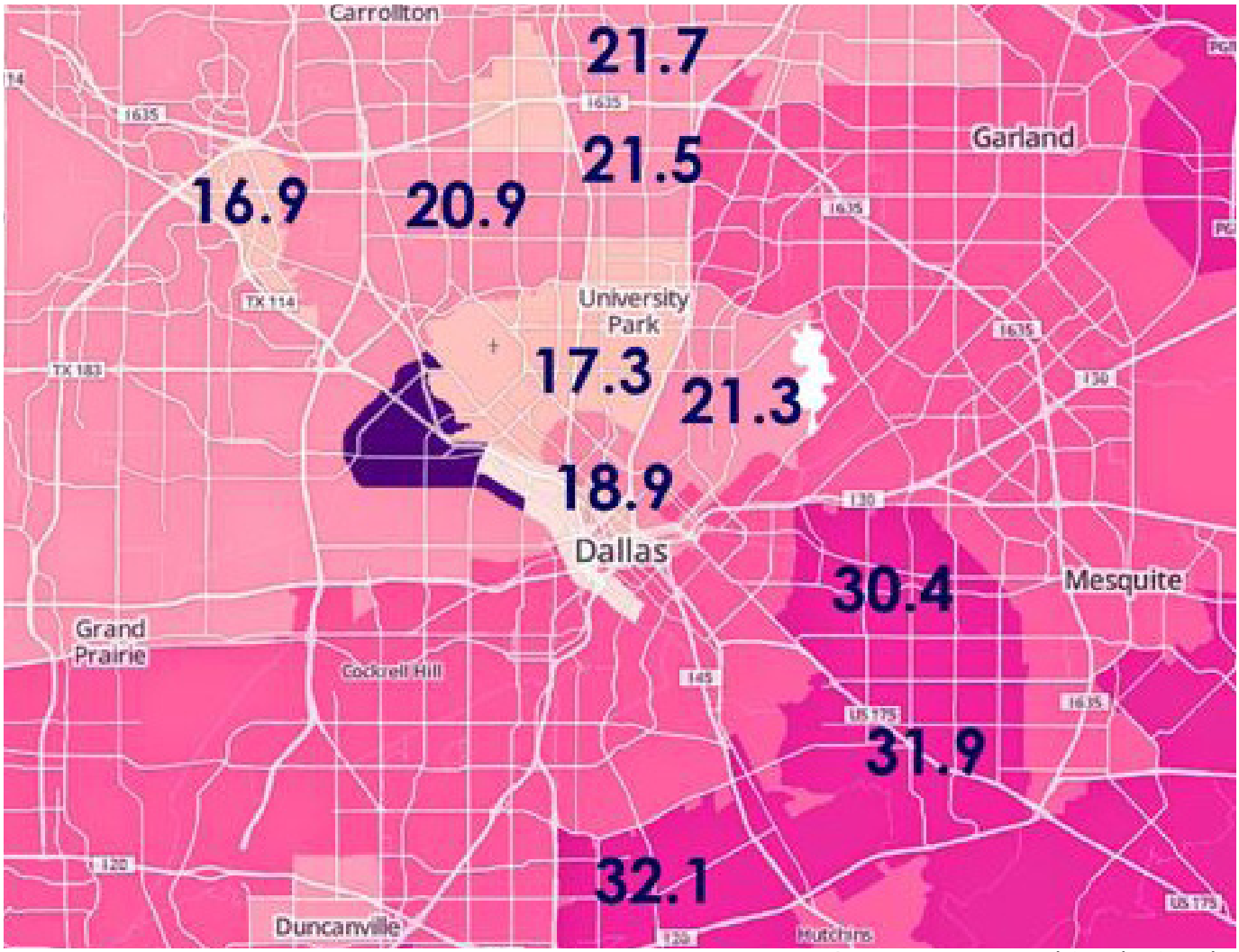
## UNDERDEVELOPED AND TAX EXEMPT PARCELS



2012 map of Underdevelopment (red) and Tax Exempt Properties (orange) created by Space Between Design Studio highlighting the relationship of underperforming properties from a tax base standpoint with highways.

# FAVORED QUARTER, DISINVESTMENT, AND COMMUTING TIME



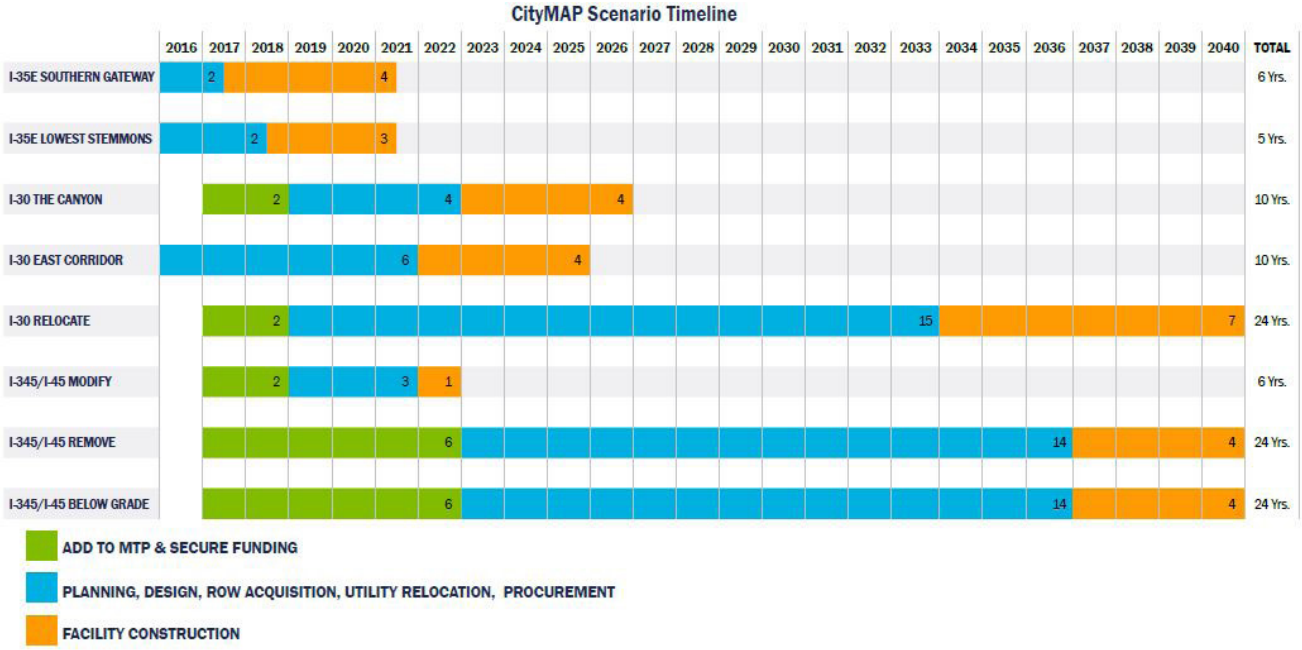

Average commute travel times by zip codes

The graphic to the left illustrates the direction of growth and investment with pink being areas of both. The image for the Dallas-Fort Worth metropolitan area was created as part of Chris Leinberger's analysis and concept of the "Favored Quarter," which suggests that investment is generally conservative and tends to follow other investment in search of favorable returns. This patterns tends to iterate over and over again as investment and growth migrates in one direction unless cities take a proactive role in reversing this singularly outward inertia. Instead, cities should set policies and incentives to encourage growth: 1) back inward towards the center of town, as well as 2) 'around the clockface' to better balance jobs and housing in order to increase opportunity and access in all parts of town, and 3) restore the value of proximity in the real estate market.

The result of this systemic inertia is that parts of town that are not in the Favored Quarter or in the opposite direction of the Favored Quarter are devoid of new investment and job growth leading to longer commute times as shown in the diagram to the bottom left of the previous page. The longest commute times are in southeast and southern Dallas, which are generally areas of lower income.

The question to be answered is whether the appropriate course of action is to continue to encourage southern Dallas to commute to jobs moving increasingly further away to the north and spending more time commuting despite the evidence of negative mental, physical, and social health outcomes of long commuting times or whether the answer is to change course and encourage jobs and housing growth back towards downtown and in closer to proximity to each other and to transit. Please see page 16 of this document for evidence of the high cost of car-dependence on lower income families.

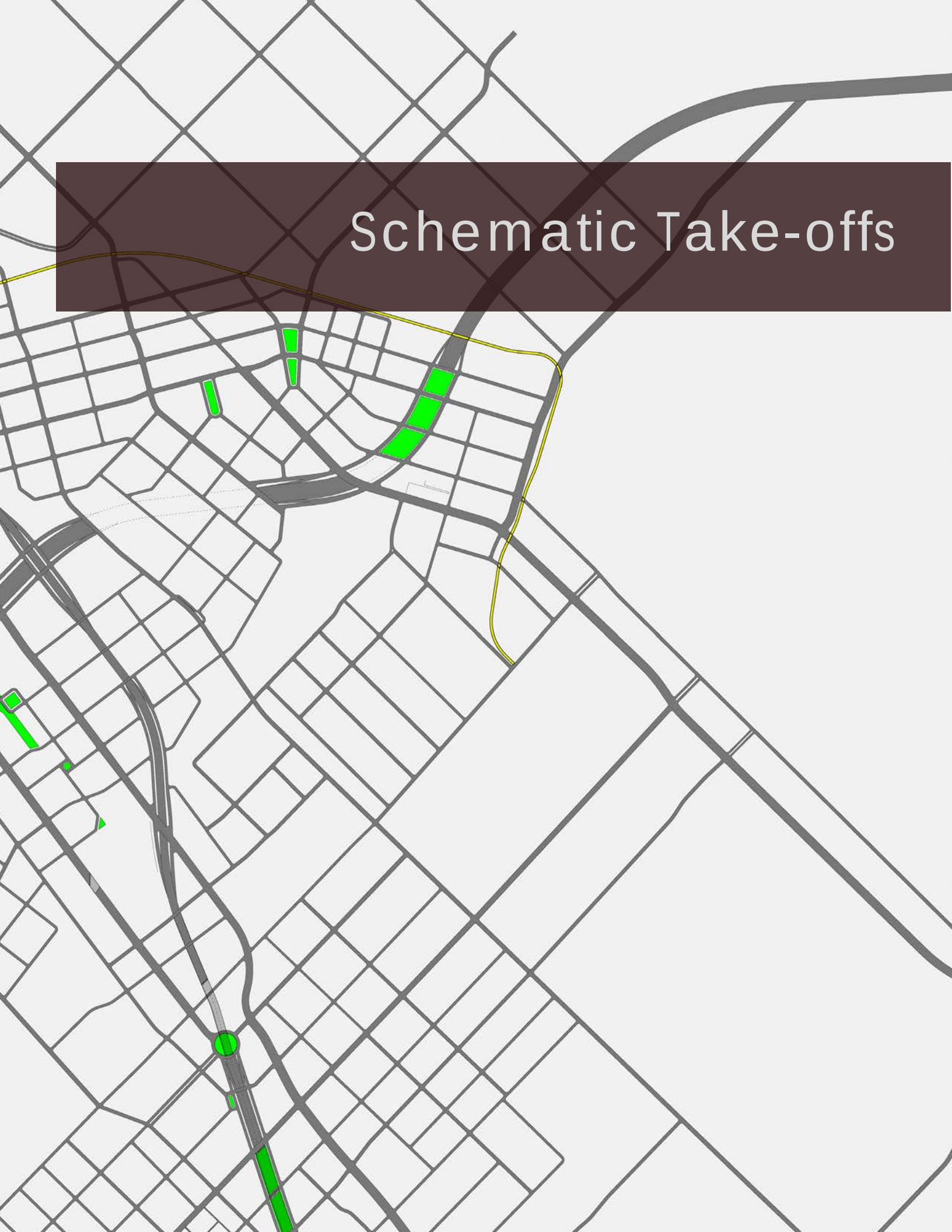
## CityMAP PROPOSED TIMELINE



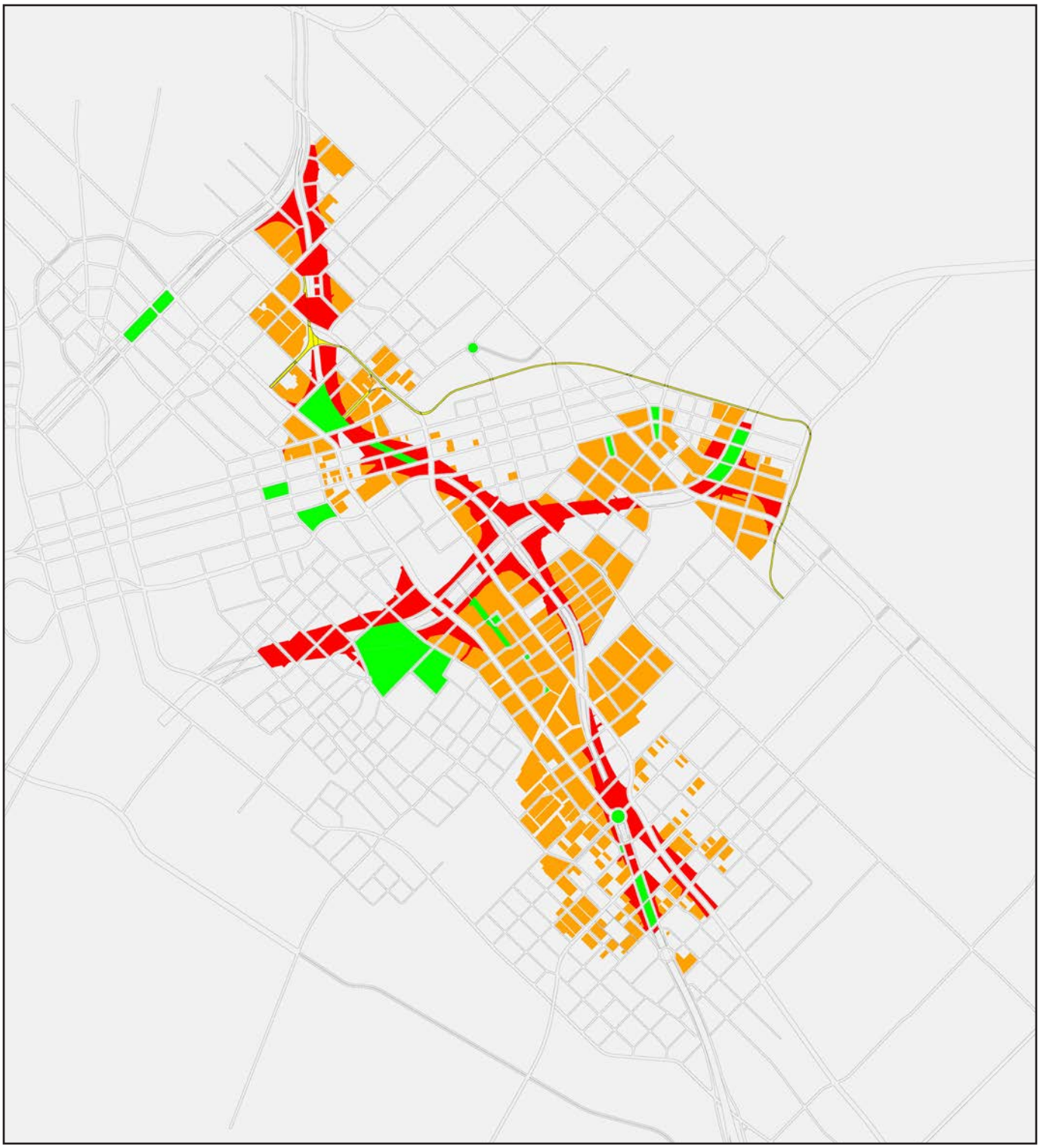

Given that TxDOT invested in repairing the structural problems of the elevated portion of IH-345 in order to keep it standing until 2040, the CityMAP report proposed a 24-year timeline for reconstruction of the corridor. However, given that the 45/345 corridor intersects with interstate-30, which is in planning and design as well as D2, the second downtown DART line, it at the very least makes sense to design all three in coordination. Furthermore, given the increasing national interest in highway mitigation and removal efforts, the increasing awareness of the futility of highway expansion, the negative impacts for the city in its current condition, and the city's need for housing near jobs and transit...

## ...THE NEED IS NOW.

# Schematic Take-offs



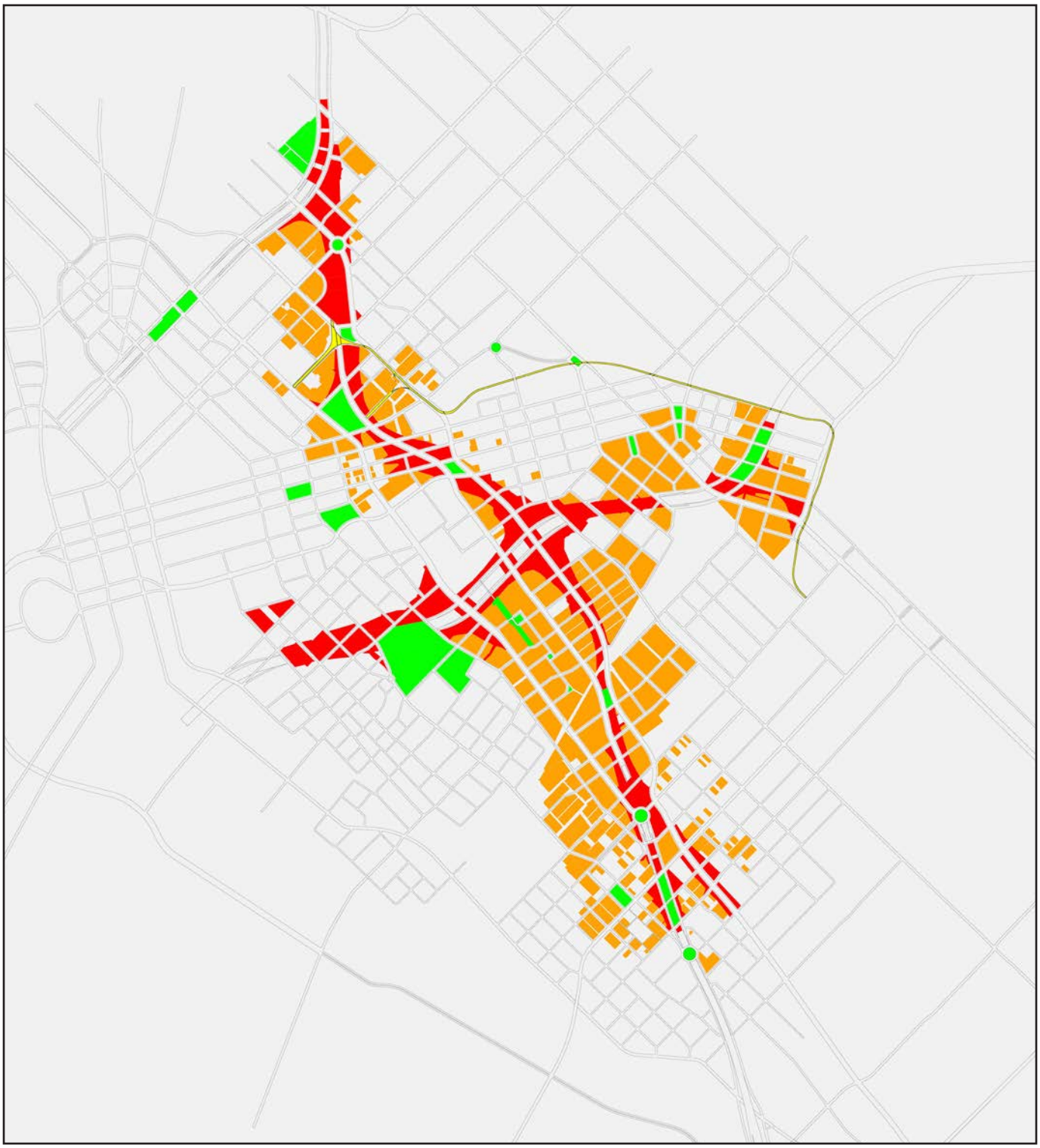
# SMALL TRENCH: RECAPTURED AND REPOSITIONED LAND



The above diagram highlighting recaptured right-of-way land (red) for private development purposes and leveraged for public good as well as land repositioned (orange) by the reconstruction of 45/345 as a small trench highway is intended to be the starting point for a more in-depth economic development study. The amount of land listed below only includes land within 1/4-mile of the 45/345 corridor:

| | |
|---|---|
| ROW Recaptured: | 81.33 acres |
| Repositioned Underdeveloped Land: | 247.90 acres |

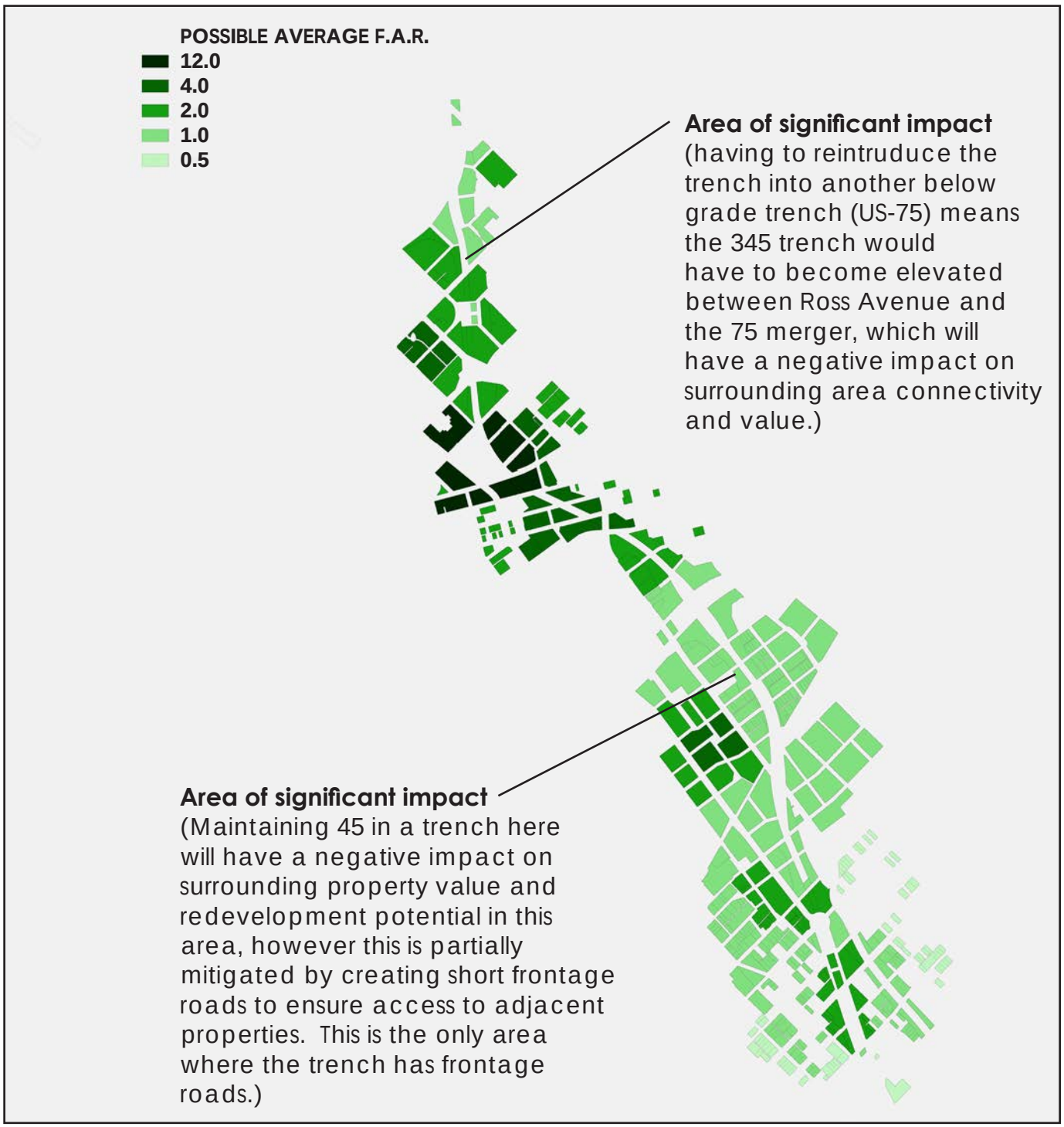
# SURFACE NETWORK: RECAPTURED AND REPOSITIONED LAND



The above diagram highlighting recaptured right-of-way land (red) for private development purposes and leveraged for public good as well as land repositioned (orange) by the reconstruction of 45/345 as a network of surface streets. The amount of land listed below only includes land within 1/4-mile of the 45/345 corridor:

| | |
|---|---|
| ROW Recaptured: | 93.5 acres |
| Repositioned Underdeveloped Land: | 283.42 acres |

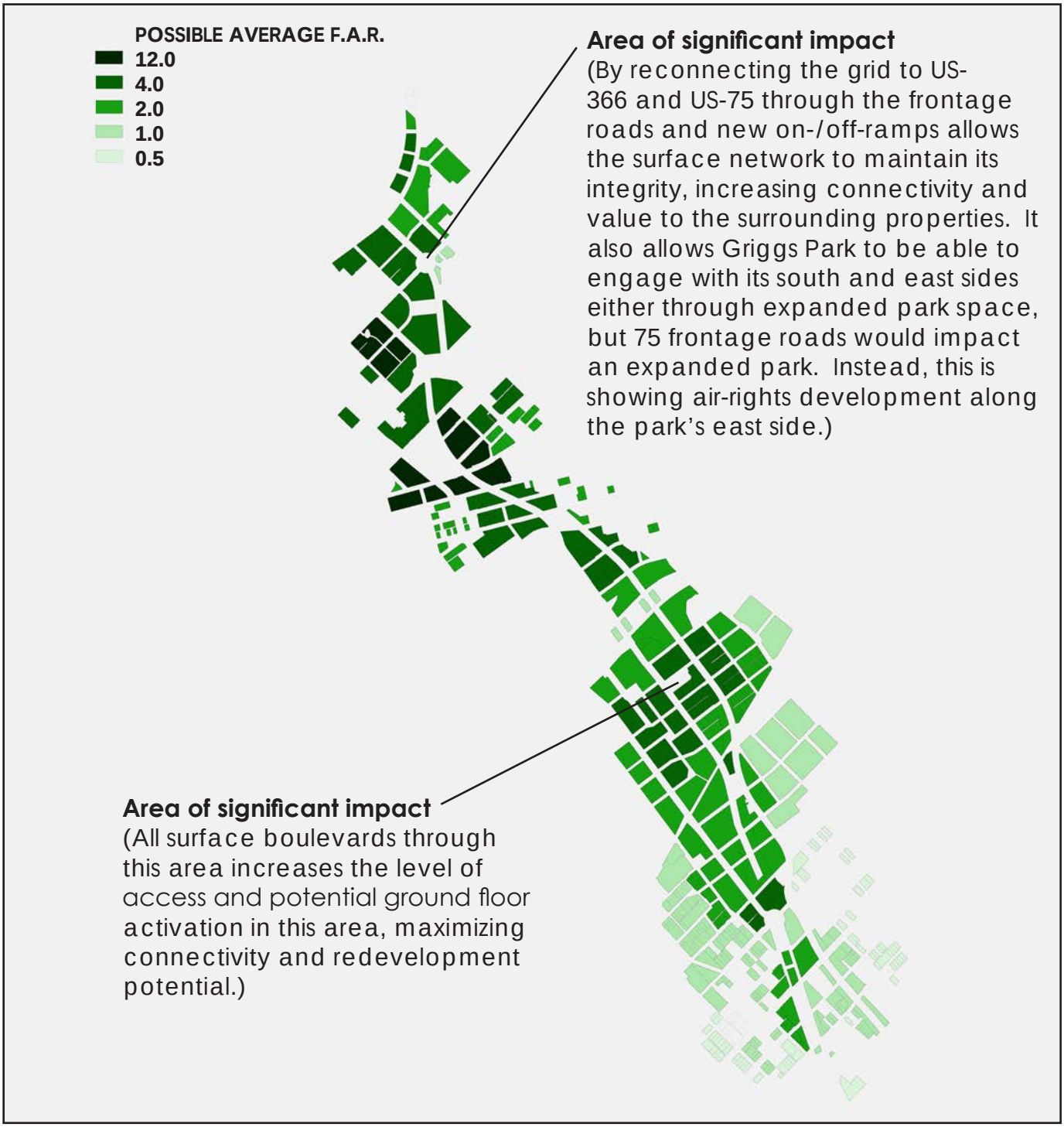
# SMALL TRENCH: POTENTIAL REDEVELOPMENT DENSITY




While it is possible that the two development scenarios could yield a similar redevelopment density, the sunken highway trench will likely still depress value and redevelopment potential along it. Therefore, to account for reduced development, the above average Floor-Area-Ratios were proposed as a qualitative assessment in order to come up with a total square footage of redevelopment potential. The above graphic shows perceived development potential given the physical relationship of property to the proposed infrastructure of the Small Trench Scenario.

Average F.A.R. Across Site: 2.33

# SURFACE NETWORK: POTENTIAL REDEVELOPMENT DENSITY




The above graphic shows perceived development potential as a qualitative assessment of the relationship of property to proposed infrastructure of the Surface Network Scenario. These qualitative assessments are an attempt to quantify the diagrams on pages 68-69 wherein greater value is believed to align with surface boulevards rather than highways. It is believed that the surface option will have significant positive impacts on the value and density potential between Al Lipscomb Way and I-30 whereas maintaining the highway in the trench scenario will harm this development potential leading to lower overall average F.A.R.:

Average F.A.R. Across Site: 3.18

# SMALL TRENCH: POTENTIAL REDEVELOPMENT DENSITY

| | |
|---|---|
| Average Area F.A.R.: | 2.33 |
| Total Land Area: | 14,341,235 sf (329.23 ac.) |
| Total Redevelopment (at 90% lot efficiency): | 30,138,105 sf |
| Total Investment (at $200/ft): | $6,027,621,070 |
| Annual Property Tax Revenue to the City: | $46,792,422.37 |
| Total Annual Property Tax Revenue: | $163,521,825.10 |

| Potential Redevelopment Program | |
|---|---|
| Residential Units: | 16,475 |
| Hotel Units: | 1544 |
| New Residents (2 per unit): | 32,951 |
| Office / R&D square footage: | 7,534,526 sf |
| Office Jobs: | 30,138 |
| Retail square footage: | 3,013,810 sf |
| Service Jobs: | 7,534 |

# SURFACE NETWORK: POTENTIAL REDEVELOPMENT DENSITY



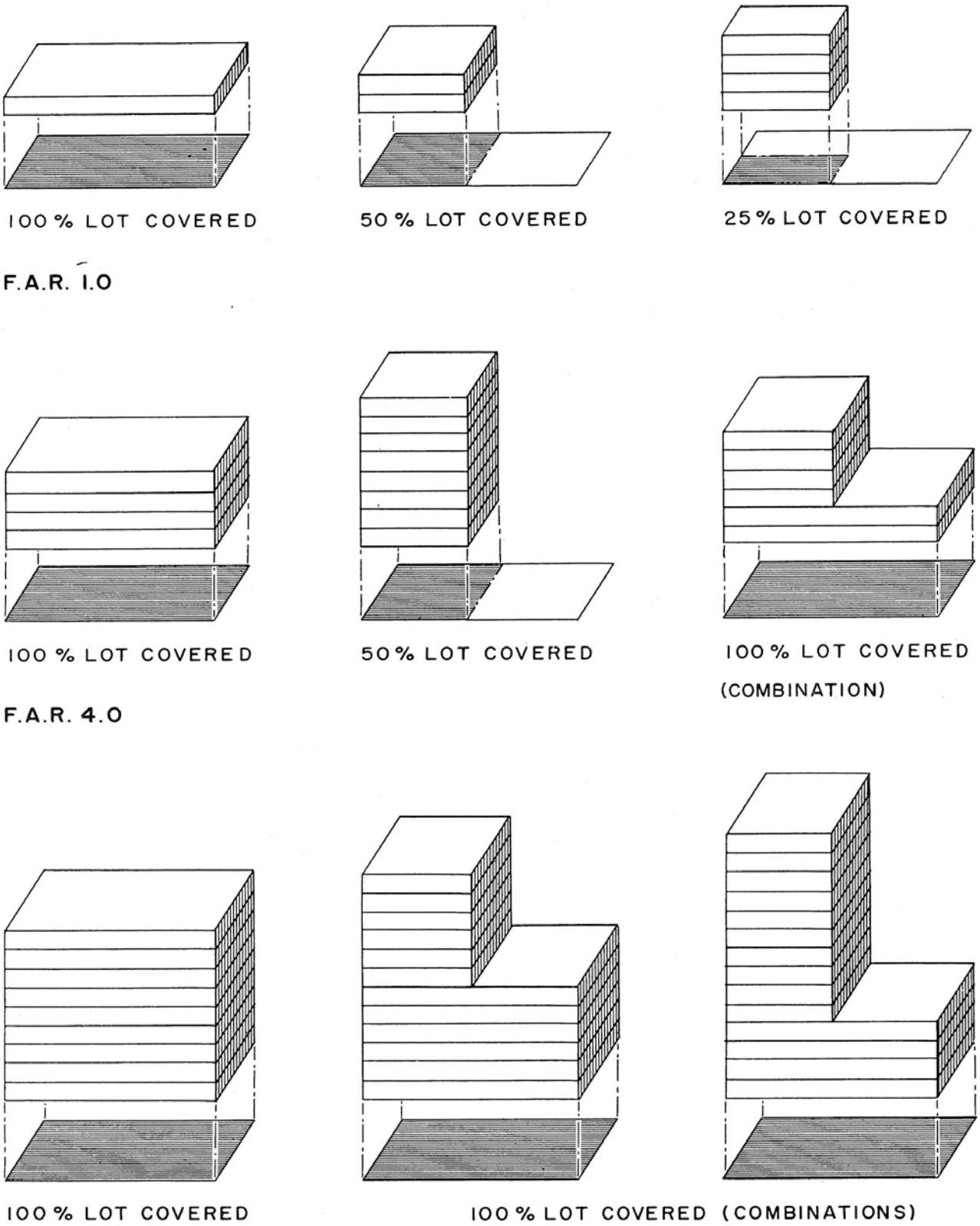
| | |
|---|---|
| Average Area F.A.R.: | 3.18 |
| Total Land Area: | 16,419,959 sf (376.95 ac.) |
| Total Redevelopment (at 90% lot efficiency): | 46,993,992 sf |
| Total Investment (at $200/ft): | $9,398,784,531 |
| Annual Property Tax Revenue to the City: | $72,962,764.31 |
| Total Annual Property Tax Revenue: | $254,977,275.85 |

| Potential Redevelopment Program | |
|---|---|
| Residential Units: | 25,690 |
| Hotel Units: | 2408 |
| New Residents (2 per unit): | 51,380 |
| Office / R&D square footage: | 11,748,480 sf |
| Office Jobs: | 46,993 |
| Retail square footage: | 4,699,392 sf |
| Service Jobs: | 11,748 |

ASSUMPTIONS:

* Calculations do not include any improvements along I-30 nor any land impacted by I-30 improvements
* Air rights development is counted where shown in the diagram as part of total redevelopment potential despite the high cost of this type of construction due to the benefits of mitigation to surrounding areas.
* Properties are deemed to have greater development potential closer to downtown, along surface arterials, and at the intersections of important surface arterials.
* Highway adjacencies are deemed to have diminished value unless mitigated through green space or air rights development.
* Projected FARs do not adhere to existing zoning, but are 1) intended as an average across a range of properties and 2) intended to align with adjacent and proposed scale of development.
* Proposed FARs are considered averages and are not intended as recommended maximum heights or densities.
* FAR projections assume strategies to reform and minimize the need for required off-street parking, particularly on smaller lots and near transit in order to achieve suggested densities.
* Only measures impact upon underdeveloped properties within 1/4-mile of the 45/345 corridor improvements.
* Infringements upon private property boundaries are intentionally minimized except where necessary for both street network improvements AND improvements to private property development potential.
* Projected office jobs is based on 4 jobs per 1,000 sf. Post-COVID impacts towards potentially lower office/job density have not been factored and are not yet fully understood.

# FLOOR-AREA-RATIO EXAMPLE




The above diagram illustrates how floor-area-ratio (FAR) is calculated using total floor area square footage divided by total lot land area. The diagram is useful in showing how different forms can be achieved within the same FAR or density category.

** The assessed values per square foot accompanying each development example includes total assessed values divided by total built, leasable floor area to better estimate the economic development multiplier as used on pages 60-61.

# FLOOR-AREA-RATIO AVERAGE 12.0 EXAMPLES

The following series of pages show examples of recent Dallas development that are similar to the proposed FAR categories.

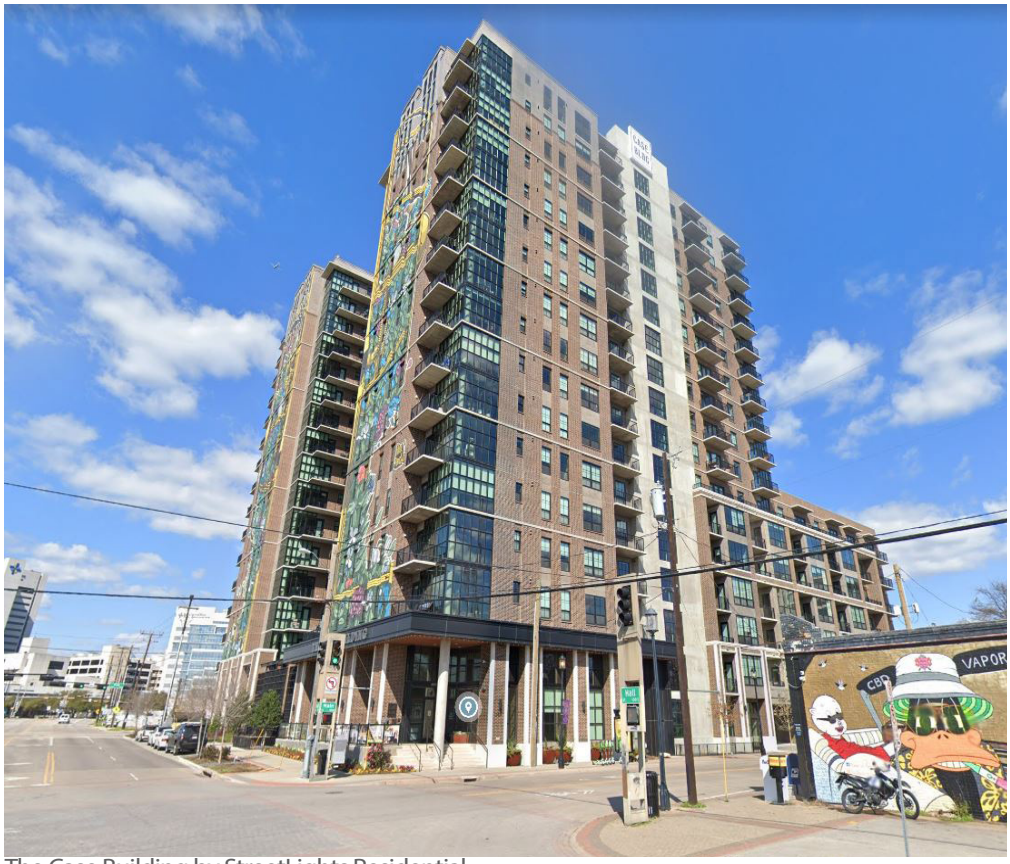
These images are intended to show the kind and scale of development that would be appropriate as designated by the FAR diagrams in shades of green.

The categories are not intended to be rigid nor maximums but instead as averages over the area as the buildings shown may not be exactly 12.0 or as listed for the other categories.

The highest density category is intended to be next to downtown around Carpenter Park and near the Arts District where value potential is perceived to be the heighest. The kinds of development expected in these areas are office and residential high-rise along with significant amount of activated ground floor use such as retail.

Once a preferred alternative is approved and design of the new street network moves forward, the city is encouraged to replat the recaptured right-of-way and initiate a re-zoning process not based on these development potentials but through a public process towards the city's adopted goals and policies.


The Park District Towers by Trammell Crow Company
Office and Residential assessed at $340/sf Floor Area (2020)



The Case Building by StreetLights Residential
Apartments assessed at $192/sf Floor Area (2020)

# FLOOR-AREA-RATIO AVERAGE 4.0 EXAMPLES


Gables McKinney Ave. by Gables Residential
Apartments and Retail (grocery) assessed at $333/sf Floor Area (2020)


Novel Deep Ellum by Crescent Communities
Apartments and Retail assessed at $214/sf Floor Area (2020)

The 4.0 category is primarily mid-rise but can be a mix of low-, mid-, and some high-rise to achieve the average area density.

It will likely be a mix of uses both vertically and horizontally, with office, residential, retail, and possibly some boutique hotel.

# FLOOR-AREA-RATIO AVERAGE 2.0 EXAMPLES

The 2.0 FAR category will primarily be residential and retail primarily in a horizontally mixed-use format with some vertical mixing of uses in key locations.

The building types will be a mix of low- and mid-rise and consist of a variety of forms including some townhomes and missing middle housing.


Bishop High Line by Urban Genesis
Apartments assessed at $165/sf Floor Area (2020)


The Armstrong at Knox by Alliance Residential
Apartments, Retail, and Grocery assessed at $283/sf Floor Area (2020)

# FLOOR-AREA-RATIO AVERAGE 1.0 EXAMPLES

The 1.0 FAR category is mostly low-rise development consisting of retail, missing middle housing, and smaller apartment buildings in a primarily horizontally mixed-use environment with some instances of vertical mixed-use buildings.

Townhomes in the State-Thomas neighborhood
Residential units assessed on average at $320/sf Floor Area (2020)


Small-scale mixed-use building in Bishop Arts by Exxir Capital
Retail and Flex Office space assessed at $193/sf Floor Area (2020)

# FLOOR-AREA-RATIO AVERAGE 0.5 EXAMPLES

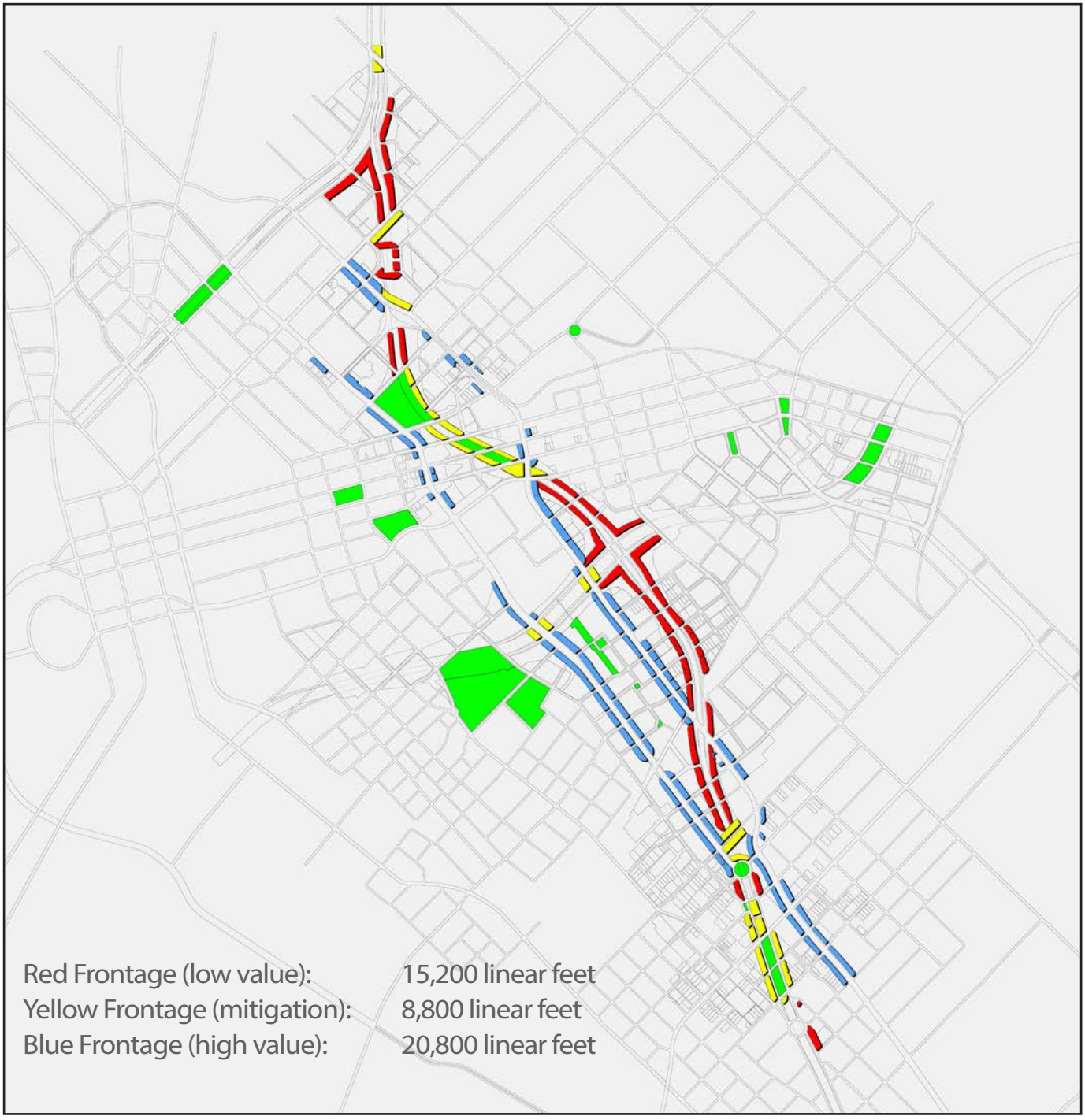
The 0.5 FAR category is intended to be primarily residential with some neighborhood-scaled service retail at key locations.

The residential can be a mix of single family, accessory dwelling units, duplexes, four-plexes, small apartment buildings and other creative Missing Middle housing types.


Example of newly constructed missing middle housing in Kidd Springs neighborhood
Duplex Residential assessed at $135/sf Floor Area (2020)

Single-story walkable retail format building in Bishop Arts by Exxir Capital
Retail assessed at $218/sf Floor Area (2020)

# SMALL TRENCH: CONSTRUCTION, MITIGATION & VALUE CREATION




Red: Highway Frontage; Yellow: Air Rights and Deck Park Frontage (Mitigation); Blue: High Value Surface Arterial Frontage

| | |
|---|---|
| Length of Trench: | 15,723 linear feet |
| Elevated Highway: | 3,020 linear feet |
| New Bridge Construction (over trench): | 5,220 linear feet |
| Deck Park Area: | 304,784 sf (7.00 ac.) |
| Air Rights Development Area: | 309,082 sf (7.10 ac.) |

# SURFACE NETWORK: CONSTRUCTION, MITIGATION & VALUE CREATION


Red: Highway Frontage; Yellow: Air Rights and Deck Park Frontage (Mitigation); Blue: High Value Surface Arterial Frontage

| | |
|---|---|
| Length of Trench: | 4,975 linear feet |
| New Surface Connector (Riverfront): | 9,361 linear feet |
| Deck Park Area: | 172,772 sf (3.98 ac.) |
| New Surface Park Area (from ROW): | 140,471 sf (3.22 ac.) |
| Total New Park Space: | 313,243 sf (7.18 ac.) |
| Air Rights Development Area: | 640,349 sf (14.7 ac.) |

# Recommended Equitable Development Strategies

# GENERAL DESIGN INTENT

Dallas' urban form is a product of the nexus of race, power, and policy. For over a century, its forefathers systematically induced a hypersegregated, radically unequal city through federal, state, and local policies explicitly intended to harm people of color, with devastating consequences for the African American community. Many of these original policies were so powerful that the autocatalytic processes birthed from their creation generated durable, intergenerational inequality manifesting itself today as the racial wealth disparity, lack of equal opportunity, and academic achievement gaps, to name a few. When segregation was made illegal, highways became the de facto destructive and divisive force.


Highways, whether elevated, at-grade, or below-grade have a negative impact (of varying and difficult to measure degree) on surrounding property values and sever interconnectivity and socio-economic interrelationships between neighborhoods. That it depresses value is without question. This is the impetus for inner-city highway mitigation and removal efforts.

Highways I-30 and the IH-45/345 corridor effectively form a plus sign (+), dividing the area into quadrants (downtown, Deep Ellum, The Cedars, and South Dallas) each with its own challenges, opportunities, and needs. All four segments of the plus sign (30 west of 345, 30 east of 345, IH-345, and I-45) all need to be either mitigated or removed, transforming barriers into redesigned seams, which in turn changes the real estate dynamics of each of the quadrants from depressing or exporting value to attracting value.

Once redesigned and rectified, these new seams will lead to an increase in demand for real estate and, in turn, rising values. This is where the potential for gentrification arises, which is negative if it leads to displacement. It is critical for the city to leverage these efforts towards inclusive growth strategies. However, investment is fundamental to growing south. While this effort has met with numerous neighborhood leaders and area stakeholders to get an initial sense of challenges, concerns, and desired outcomes, it is critical for the city to work with these neighborhoods as these efforts move forward through a formal city-led process and adopted policies to ensure positive outcomes.

The highway system has done significant damage to the people of Dallas, none more so than its African American community. Simply removing the highway and wishing reconciliation would be a dereliction of duty. That's why a spirit of redress for the African American community must be infused into the planning ethos of what comes after the concrete vanishes. This section attempts to lay out initial ideas and recommended strategies to ensure inclusive growth, a way to "build boats ready to float when the tide comes in."

## PRIMARY AREA NEEDS


Higher land values are good for cities. At the most basic level, increased land value means increased tax base, but greater demand for investment in real estate equates to increased leverage by the public sector and elected officials to make policies like incentive zoning more effective in order to realize the desired public benefit. Furthermore, high land value means high demand and provided the public sector is able to leverage that demand into affordable and workforce housing in a high density and high access environment, near jobs and transit, that will significantly reduce average household transportation costs on these residents. It will also yield a modal shift from single occupancy vehicles towards increased trips via active transportation modes such as walking, bicycling, and public transit which equates to reduced local area pollution and greenhouse gas emissions.

## PUBLIC BENEFIT FUND(S)

The design options proposed in this document will yield significantly increased value and private investment in the area. While, to some extent, the purpose of public investment in infrastructure is to yield private investment and help the local economy function and generate opportunity and prosperity, the city should also ensure that public benefits are created, public harms avoided or at least mitigated such as displacement, and to the extent possible recompense is made for those harmed by the construction of the highway. The subsequent pages highlight the various needs, challenges, and some recommended strategies for each of the quadrant neighborhoods.

The two options presented in this document could potentially yield between $6 and $9 billion in new private investment and value creation and between $46 and $73 million per year in annual property tax revenue to the city. This increased value due to the city's initiative for how to plan and design the 45/345 corridor will yield such significant private investment that the city should borrow against or set aside some portion of new revenues for a Public Benefit Fund that could include various strategies and policies as proposed on the following pages.

# DOWNTOWN

## NEEDS:

- Housing, lots of it. While Downtown has significantly increased its permanent resident population over the last twenty years (from approximately 200 to 11,000), some studies have suggested permanent downtown residential population needs to approach 30,000.
- Affordable housing near jobs and transit
- Increased pedestrianization, activity, and ground floor retail
- Greater variety of groundfloor businesses and agglomerations
- Increased entertainment options
- Improved multi-modal connections to adjacent neighborhoods

## CHALLENGES:

- Few surface street connections to surrounding neighborhoods causing vehicular choke points and limiting multi-modal network capacity potential as modes must compete for limited space and connection opportunities.
- High land costs due to speculation
- Office and residential rents too low in many parts of downtown sufficient for new investment
- Low pedestrian counts on many streets limiting ground floor retail potential.

## RECOMMENDED STRATEGIES:

- Tax Increment Financing to encourage and help finance mixed-income housing
- Creation of a Housing Trust Fund as part of the Public Benefit Fund Strategy to offer mezzanine financing for mixed-income housing particularly for 80-120% AMI
- Property Tax Abatement for Affordable Housing Units
- Incentive Zoning for Community Benefits such as family-sized units (2- and 3-br), daycares, and schools associated with development
- Creation of a Parking Benefit District to manage parking supply, demand, and dynamic pricing while also collecting and directing revenue to various public improvements
- Explore possibility of a Special Assessment District to help fund future streetcar operations and maintenance costs
- Community Employment Programs to encourage local hiring and to coincide with Construction and Trade Apprenticeship Programs
- Local Artist Program

# DEEP ELLUM


## NEEDS:

- Maintain character and vitality -- however, not at the expense of the area's ability to evolve and adapt
- Increased daytime population, pedestrianization, and activity
- Improved streetscapes, public realm, and last mile connections to public transit
- Increased multi-modal accessibility and connectivity
- More housing around the periphery of Deep Ellum in order to stabilize Deep Ellum's boom and bust cycles
- More parks, green space, and recreation opportunities
- More shade and pedestrian comfort
- Parking demand management

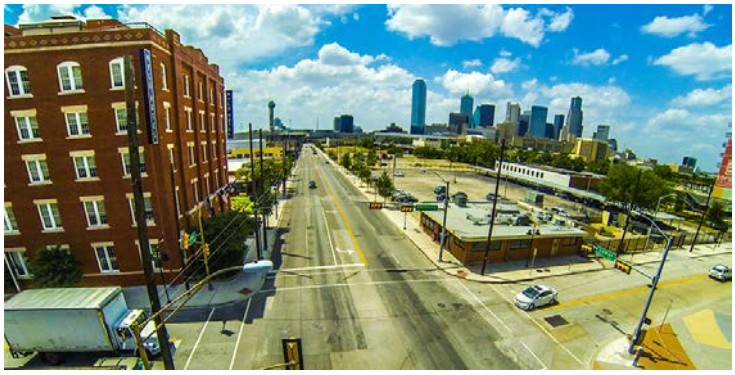
## CHALLENGES:

- High parking demand on weekend nights, but relatively low demand for parking during the day
- Lack of daytime population and, in turn, daytime activity as well as easy, convenient access for downtown employees to Deep Ellum businesses
- Potential lack of available land for infill redevelopment
- Heat island effect, lack of shade, and pedestrian comfort
- Area bounded by IH-345, I-30, and DART Green Line

## RECOMMENDED STRATEGIES:

- Creation of a Housing Trust Fund as part of the Public Benefit Fund Strategy to offer mezzanine financing for mixed-income housing particularly for 80-120% AMI
- Incentive Zoning for Community Benefits such as family-sized units (2- and 3-br), daycares, and public space
- Property Tax Abatement for Affordable Housing Units
- New DART station on Green Line at Main Street
- Relocation of City Service Yards for redevelopment and new green space
- Elimination of off-ramps and high-speed on-/off-ramps for I-30 and overall minimizing of I-30's width and negative impact on surroundings
- Creation of a Parking Benefit District to manage parking supply, demand, and dynamic pricing while also collecting and directing revenue to various public improvements
- Local Artist, Culture, and History Program as determined by cooperative effort between city and local leaders and experts

# THE CEDARS



## NEEDS:

- Increased homeless assistance
- Access to useable parks and recreation
- More housing at all affordability levels including attracting market-rate housing
- Improved public realm, multi-modal mobility improvements, and last mile connections to public transit
- Access to grocery stores and other food services
- Updated and upgraded utilities

## CHALLENGES:

- Lack of homeless shelters and assistance in other parts of the city puts disproportionate stress on this neighborhood
- Existing operational businesses
- Public safety
- High percentage of renter occupied units between 81-88%
- Aged, deteriorating infrastructure and utilities
- Proliferation of vacant land and buildings

## RECOMMENDED STRATEGIES:

- Business Relocation Program to offer incentives for existing businesses such as low intensity warehouses and logistics facilities to relocate to lower cost property, opening land for higher and better land use
- Creation of a Housing Trust Fund as part of the Public Benefit Fund Strategy to offer mezannine financing for mixed-income housing particularly for 80-120% AMI
- Incentive Zoning for Community Benefits such as family-sized units (2- and 3-br), daycares, and schools associated with development
- Community Land Trust - purchase or acquire land either existing private land or excess public right-of-way - to be long-term landowner and steward to ensure value creation and public good work hand-in-hand
- Local Artist Program
- Future bond projects to upgrade infrastructure and utilities in order to attract and accommodate infill density
- Public-Private Partnership with grocery owner-operator in order to provide the service until the area grows enough in order to support the grocery

# SOUTH DALLAS



## NEEDS:

- Repopulate the area as population has dropped by more than 50% since 1970
- Increased job opportunities
- Grocery and food services
- Improved Multi-modal safety and accessibility to areas of high opportunity

## CHALLENGES:

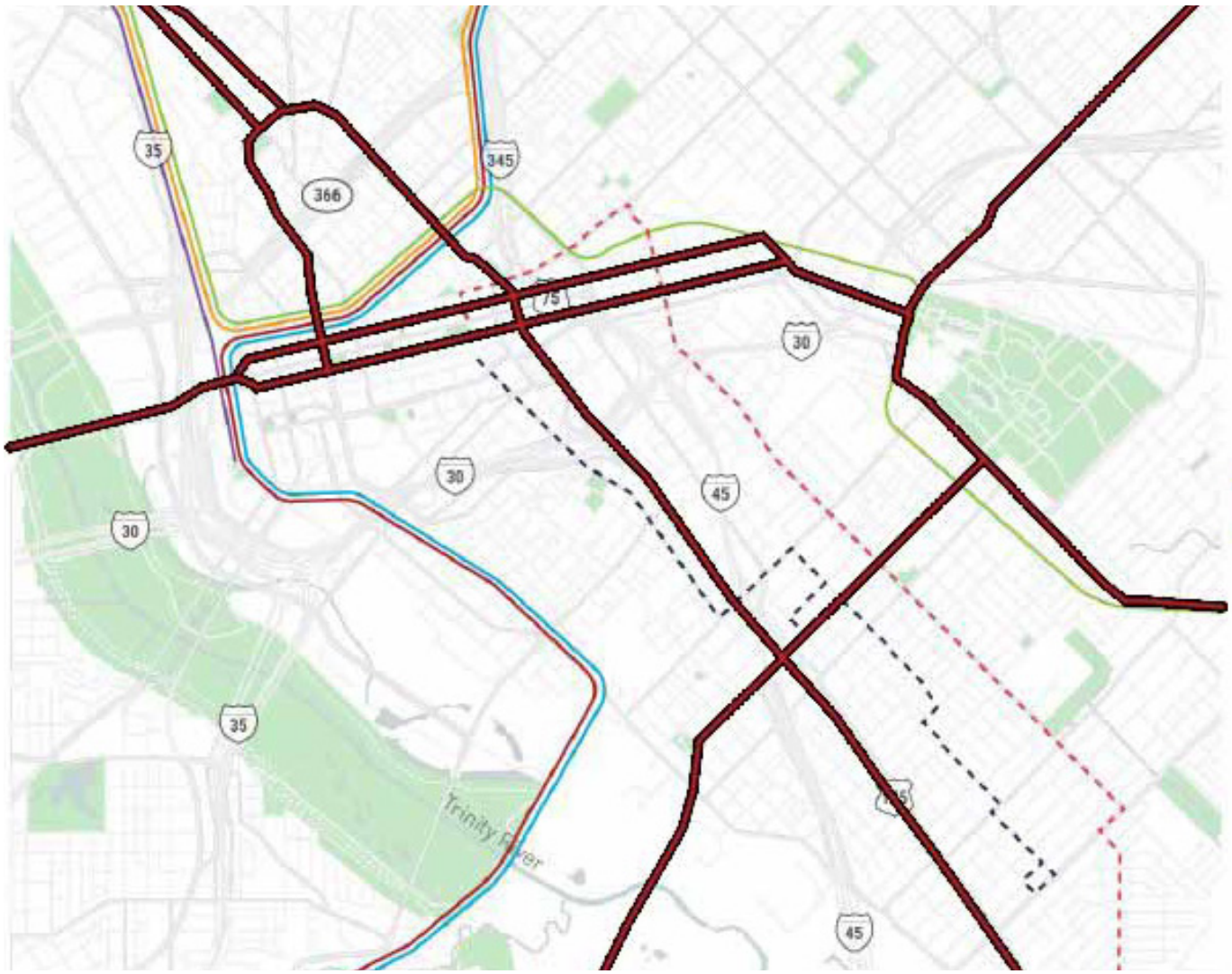
- Possibility of displacement
- Poverty Census tracts between 26-37% - some block groups (smaller unit than tracts) as high as 45-48%
- Unemployment between 6-10% not particularly high but median incomes are quite low
- Food desert - population and income levels below thresholds grocery stores look for when locating - despite JLL 'snapshot' study showing the area spends sufficiently on food enough to support three grocery stores
- High percentage of renter occupied units

## RECOMMENDED STRATEGIES:

- Lease-to-Own Housing Program allowing renters to generate equity provided they stay in the home for a certain period of time. Increase neighborhood stability and choice in when to sell and/or relocate.
- Down payment assistence and low interest loan programs to increase
- Property Tax Relief Program that would limit increases in property tax assessments for low-income homeowners or renters
- Accessory Dwelling Unit (ADU) accelerator fund to increase density, housing options, and mortgage assistance for the homeowner
- Pre-Approved Missing Middle Housing Pattern Book for ADUs, Townhomes, Duplexes, and Four-Plexes to expedite permitting and approval process for small investors and builders
- Entrepreneurship and job training programs
- Construction and Trade Apprenticeship Program
- Community Land Trust on existing City land bank property or where assemblages are possible on dispensed right-of-way

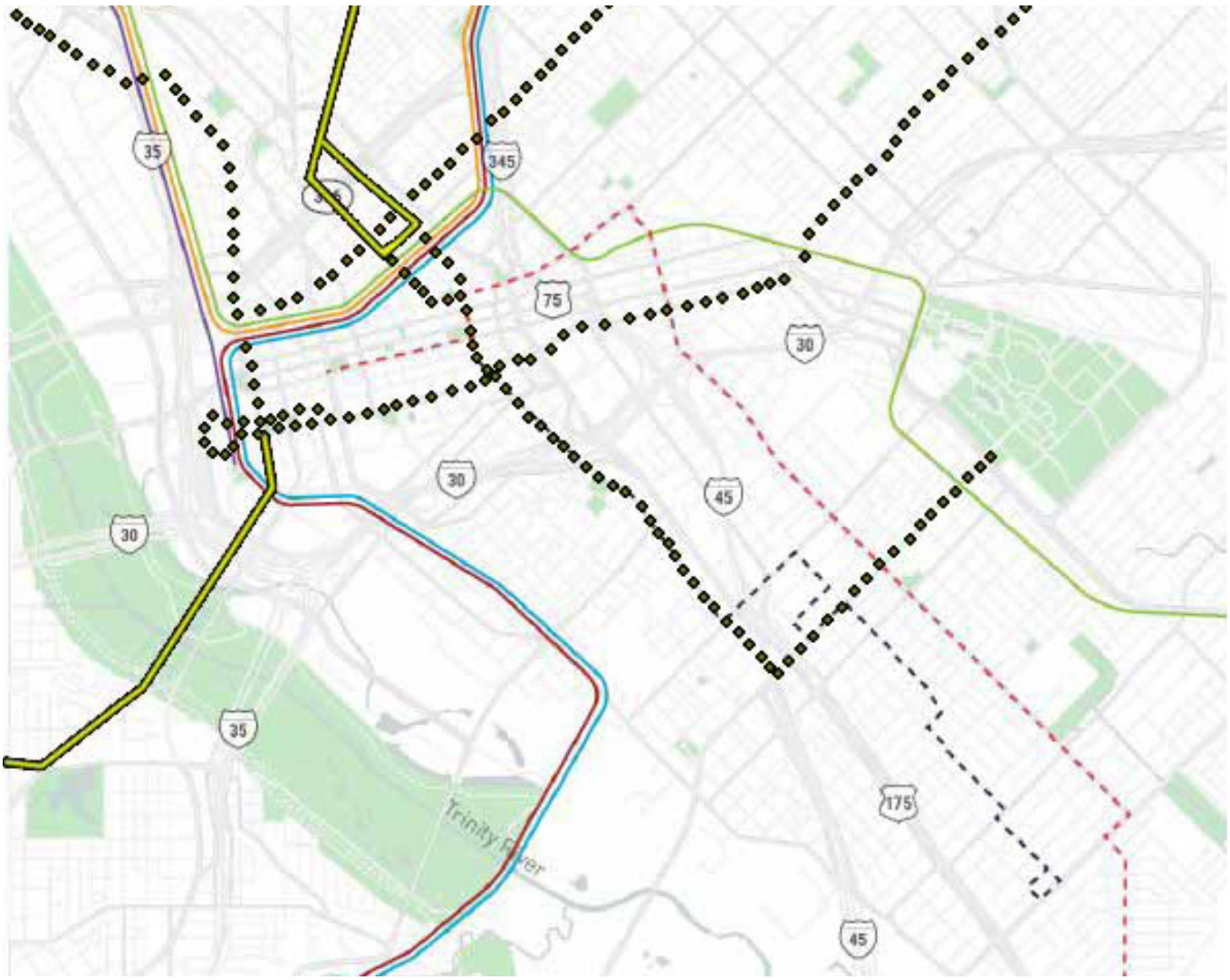
# HIGH CAPACITY BUS NETWORK (RAPID RIDE OR BRT)






The city of Dallas does not have Bus Rapid Transit (BRT) or Rapid Ride bus lines in operation currently. While there are some specific differences in these two services, the similarities are more important in that they essentially provide a rail level of service by bus to areas of town unlikely to be served by rail anytime soon and at much lower capital costs. These service improvements include high all-day frequency, dedicated rights-of-way or lanes within arterial streets, traffic signal priority, queue jumping, etc. BRT and Rapid Ride bus would be a great way to quickly improve north-south connectivity in the city of Dallas.

# EXPANDED, INTERCONNECTED MODERN STREETCAR NETWORK


The city of Dallas currently has two streetcar lines (shown as solid yellow lines), the historic McKinney Avenue Streetcar line linking downtown and uptown neighborhoods and the modern Oak Cliff Streetcar line linking the Bishop Arts District to downtown Dallas. However, these two lines are disconnected and therefore ridership potential is limited. With two extensions further into and through downtown and with two new lines a robust network (dotted lines) could be created linking all of the surrounding neighborhoods to each other within one convenient transfer provided sufficient frequency.

# ISSUES & EXTERNALITIES

While there may be a perception that there is never enough parking, due to the conditioned presumption that parking must always be free and convenient, the over-abundance of parking has significant negative externalities -- hence, the title of Donald Shoup's book, The High Cost of Free Parking. The clearest signal that parking is in over-abundance is precisely when it is inexpensive. See the chart on the next page from Colliers International's Annual U.S. Central Business District Parking Survey measuring the average monthly parking rates for downtowns across the country.

The cost of parking is purely a supply and demand equation. Where parking costs are low, there is too much of it. Where parking costs are high, there is high demand for more productive space such as commercial space and housing, both of which can be said to have broader societal benefits whereas parking imposes additional costs onto society such as encouraging driving and therefore congestion and pollution.

Requiring mandatory minimum off-street parking also imposes significant construction challenges and most developments are, in essence, shoe-horned around a parking structure. There are not only spatial and geometric costs to providing mandatory minimum off-street parking, these requirements also add significant costs to construction, sometimes up to 20%, all of which get passed onto eventual residents.

If we can expedite the delivery of new housing at lower costs by eliminating parking minimums where access to jobs and transit is high, and thus the need for off-street parking is negligible, we can also have retail without required parking since the best parking spot to serve retail is a bedroom nearby. The result is an entirely new urban eco-system and development pattern based on multi-modal mobility that is lower cost to build and lower cost to live in and get around.

# RECOMMENDATIONS

Eliminate all parking minimums in the study area to encourage creative infill. Doing so will invariably externalize the costs of parking onto the public realm which is a good thing, meaning public parking facilities whether on-street or off- become assets to be managed and generate revenue.

While the elimination of minimum parking requirements is a carrot for the private sector, it should be accompanied with a stick. Any new parking facility should be required to be buried or hidden, wrapped by productive land uses on all sides. While parking does need some wayfinding, it also invariably has a negative presence on the street and surrounding properties. Wayfinding technologies can now be made available through mobile technology.

Existing parking facilities have the potential to be liabilities or assets moving forward as the supply-demand equation changes over time. New parking facilities add supply and potentially reduce rental rates for parking, making these new facilities potential liabilities. Therefore, along with changing technologies and construction techniques, it is strongly recommended that any new parking facilities be designed for adaptive re-use potential or rapid deconstruction.


Any off-street structured parking facilities should be either below-grade or wrapped (hidden by buildings - image on right) rather than disguised or decorated to look like something else (image on left).

# CREATION OF PARKING MANAGEMENT & BENEFIT DISTRICTS


Parking Management and Benefit Districts are created in order to 1) increase revenues generated by parking facilities through careful management of supply and demand for parking and 2) re-invest that revenue into public benefits within the same area. Since the value of and demand to be in the area drives this revenue generation and that the demand for parking imposes negative externalities onto the area, it is important for these revenues to remain in the area to off-set those external costs.

Parking Management and Benefit Districts can be admistered by a public-private entity such as a Public Improvement District and manage dynamic demand-based pricing in order to calibrate cost to demand and encourage turnover necessary for retail activity.

A parking management district can also manage shared-parking agreements in order to maximize existing assets, which also allows for construction on difficult or irregular sites.

Lastly, the Parking Management/Benefit District can liability through both revenue generation and security measures.

*what was once was considered progress is now dated...*

*...what once was considered dated is timeless.*

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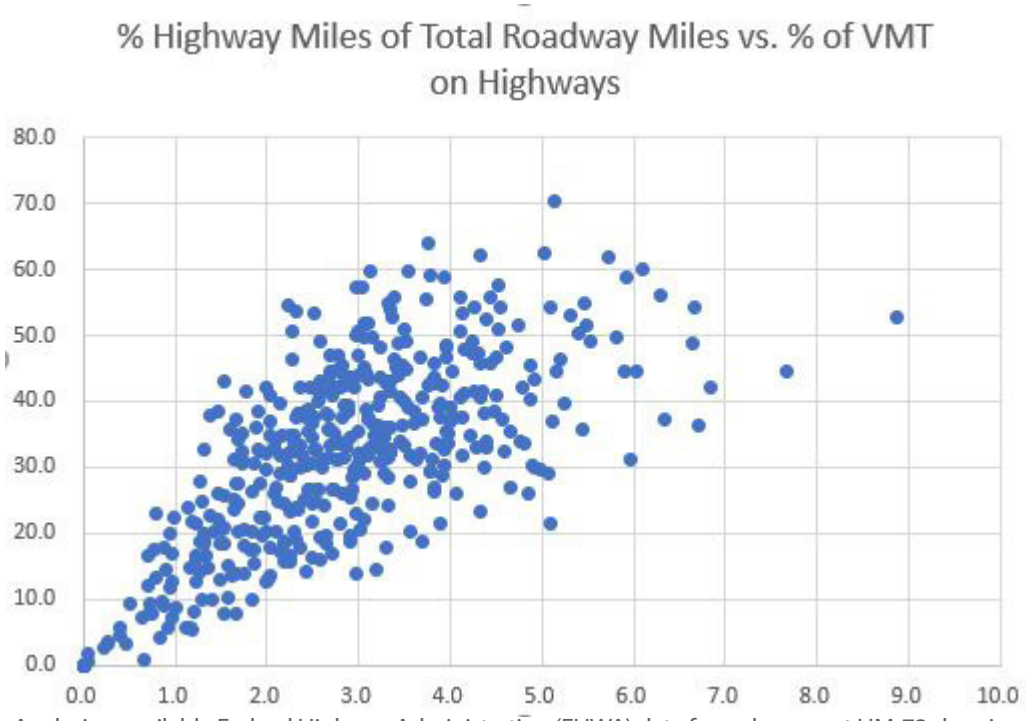
# ADDITIONAL CHARTS & DATA POINTS (CONTINUED)

**DANGER RANKING AMONG 12 LARGEST METRO AREAS IN THE U.S.**

| | TOTAL RANK | PEDESTRIANS HIT | BICYCLISTS HIT | SPEEDING INVOLVED | ON INTER-STATES | PEDESTRIANS ON INTER-STATES | DUI INVOLVED | DRUGS INVOLVED | MULTIPLE FATALITIES | TRUCKS INVOLVED | AT INTER-SECTIONS | TRAFFIC BACKUPS INVOLVED | RESULTED FROM RAGE CHASE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Houston** | 1 | 5 | 4 | 2 | 2 | 2 | 1 | 1 | 3 | 3 | 5 | 2 | 4 |
| Dallas | 2 | 9 | 10 | 1 | 1 | 1 | 3 | 3 | 5 | 2 | 9 | 1 | 3 |
| Phoenix | 3 | 2 | 2 | 3 | 6 | 11 | 2 | 5 | 1 | 4 | 2 | 5 | 6 |
| Miami | 4 | 1 | 1 | 10 | 3 | 4 | 5 | 4 | 4 | 8 | 1 | 4 | 11 |
| Philadelphia | 5 | 6 | 8 | 4 | 4 | 3 | 4 | 2 | 6 | 5 | 6 | 12 | 9 |
| Atlanta | 6 | 7 | 9 | 7 | 5 | 5 | 10 | 12 | 2 | 1 | 4 | 6 | 2 |
| Chicago | 7 | 11 | 7 | 5 | 7 | 7 | 7 | 7 | 8 | 6 | 8 | 8 | 5 |
| Los Angeles | 8 | 3 | 3 | 6 | 12 | 12 | 9 | 8 | 9 | 10 | 3 | 7 | 8 |
| San Francisco | 9 | 8 | 5 | 9 | 11 | 9 | 8 | 10 | 11 | 12 | 10 | 3 | 1 |
| New York | 10 | 4 | 6 | 12 | 10 | 6 | 11 | 6 | 10 | 9 | 7 | 10 | 12 |
| Washington, D.C. | 11 | 10 | 12 | 8 | 8 | 8 | 6 | 9 | 7 | 7 | 11 | 11 | 7 |
| Boston | 12 | 12 | 11 | 11 | 9 | 10 | 12 | 11 | 12 | 11 | 12 | 9 | 10 |

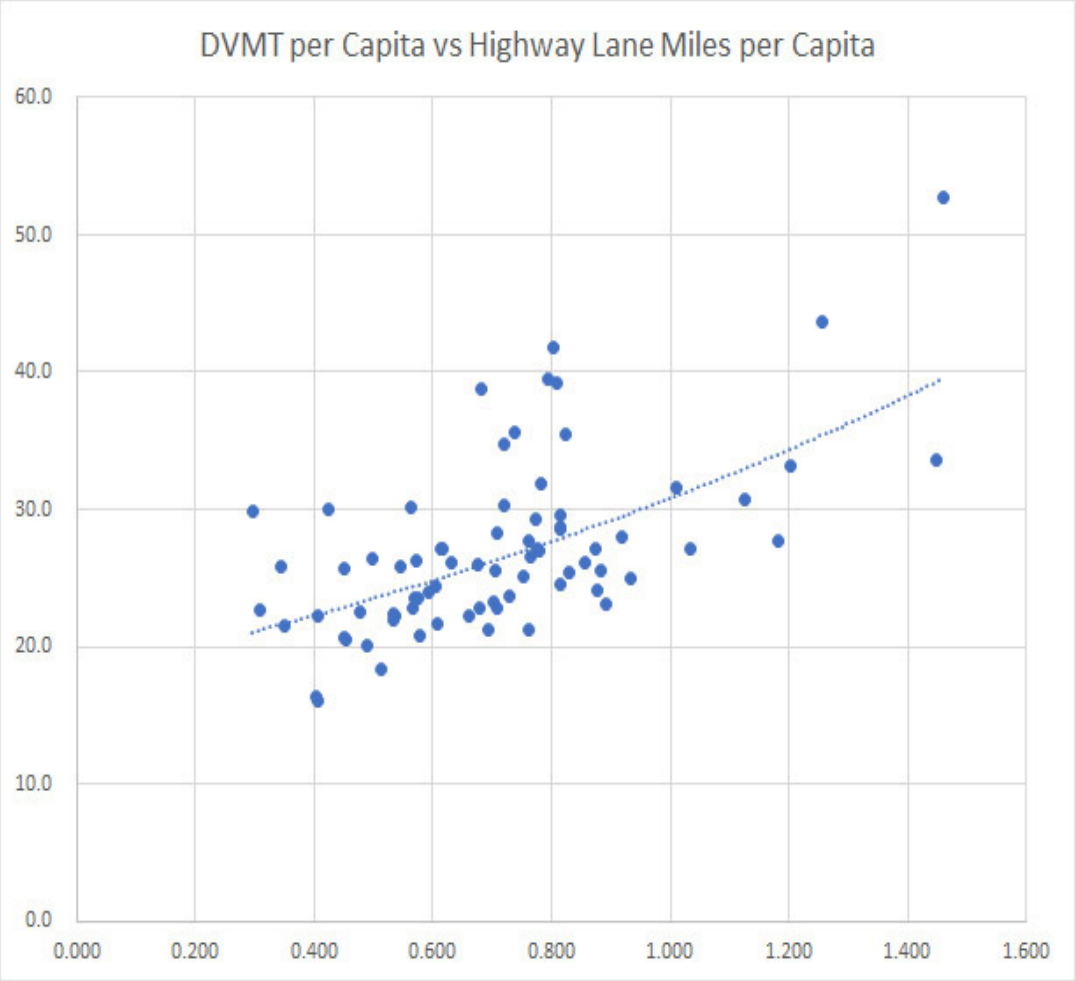
*Source: National Highway Traffic Safety Administration* — Houston Chronicle

Graphic from the Houston Chronicle's series "Out of Control" on traffic fatalities showing Dallas is number 1 of the twelve largest metros for traffic fatalities related to speeding, on interstates, pedestrians on interstates, and where traffic backups are involved.

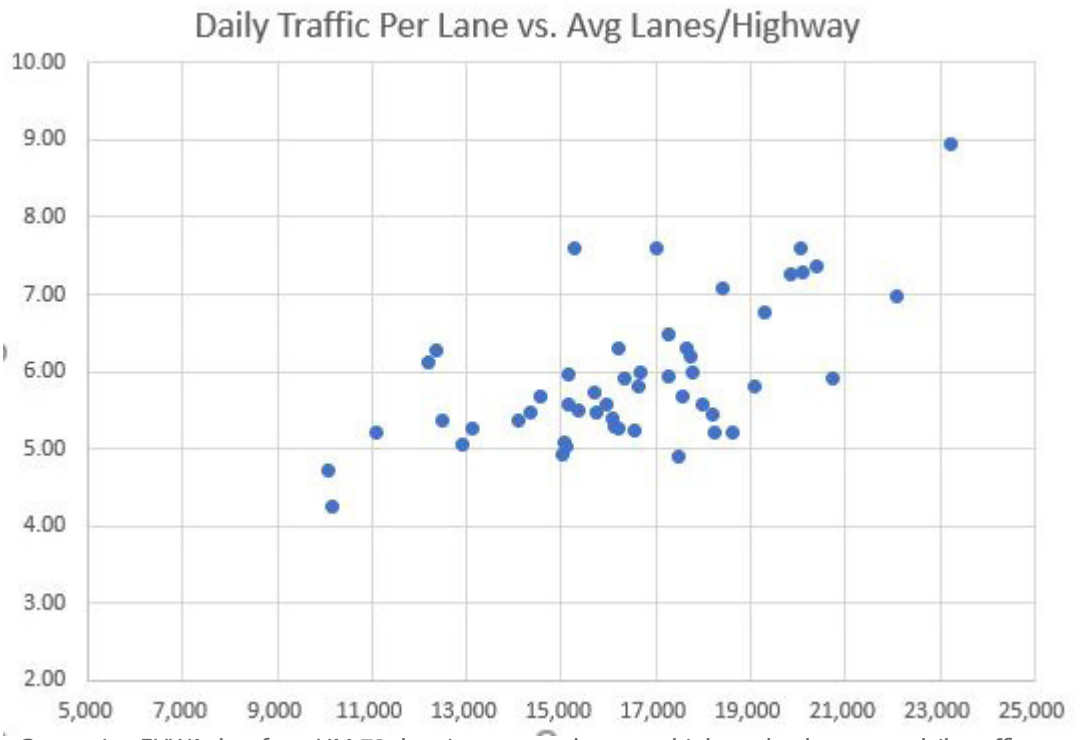



Analyzing available Federal Highway Administration (FHWA) data from document HM-72 showing that the greater proportion of total roadway miles are comprised by highway miles leads a greater percentage of driving mileage on highways (Braess' Paradox).

# ADDITIONAL CHARTS & DATA POINTS (CONTINUED)

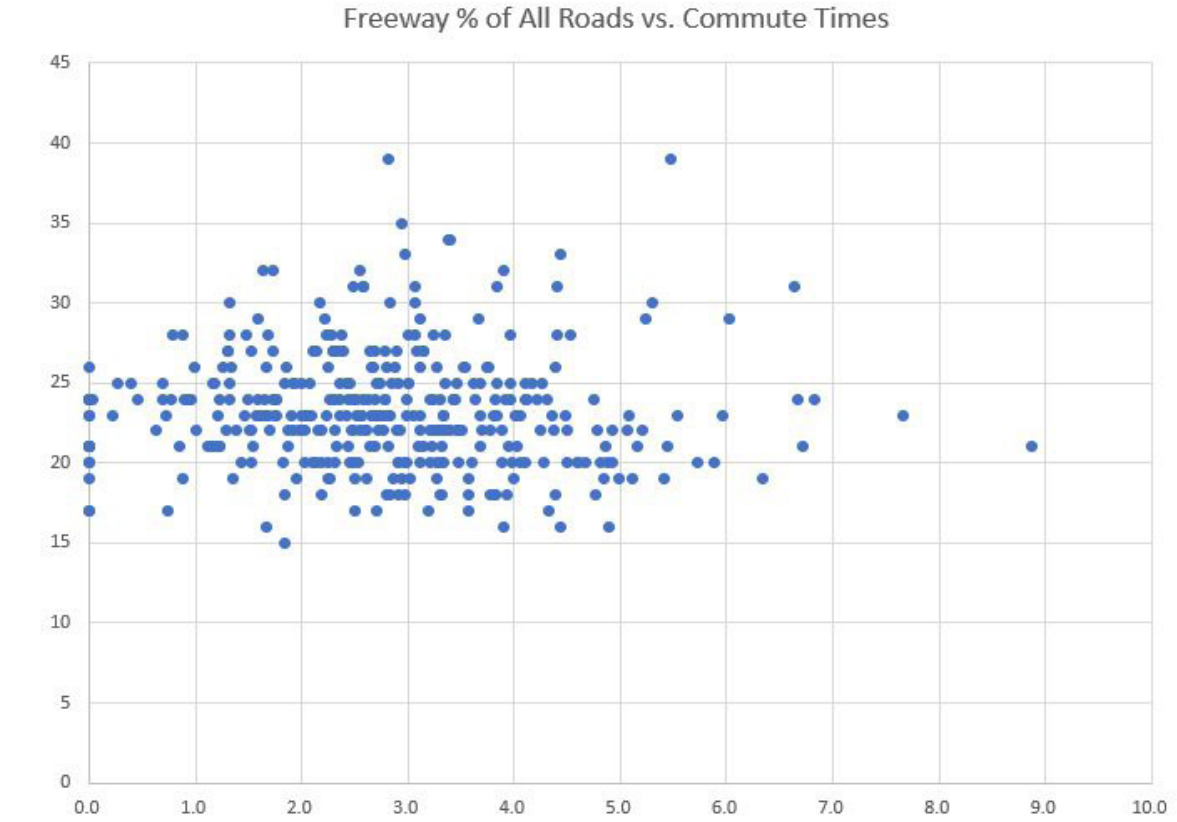



Comparing FHWA data from HM-72 showing increased Daily Vehicle Miles Travelled (DVMT) per capita in proportion to increased Highway Lane Miles per capita (induced demand).

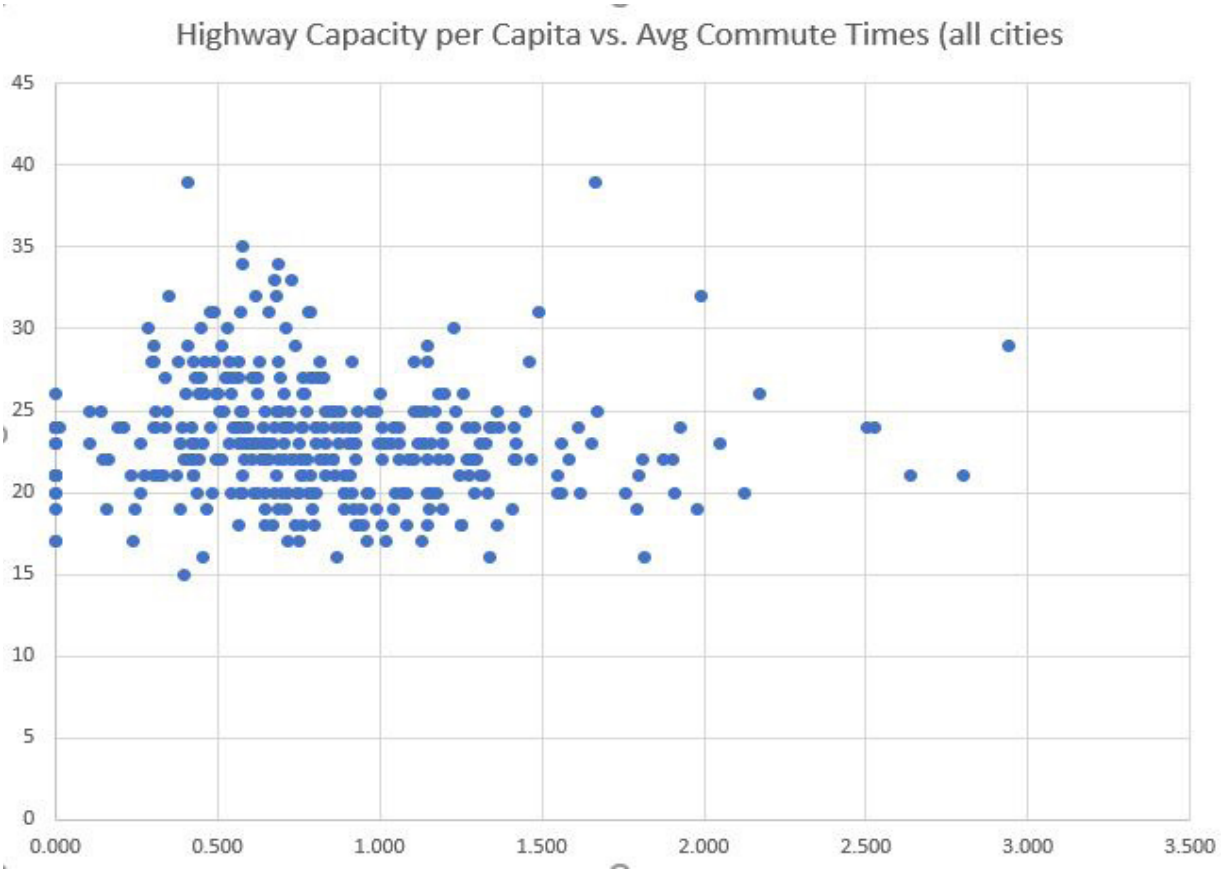



Comparing FHWA data from HM-72 showing average lanes per highway leads to more daily traffic per highway lane (induced demand).

# ADDITIONAL CHARTS & DATA POINTS (CONTINUED)




Comparing FHWA data from HM-72 showing proportion of Highway Miles per Total Road Miles in US Cities compared to Average Commute Time (Marchetti Constant)




Comparing FHWA data from HM-72 showing Highway Capacity per Capita in relation to Average Commute Time (Marchetti Constant)

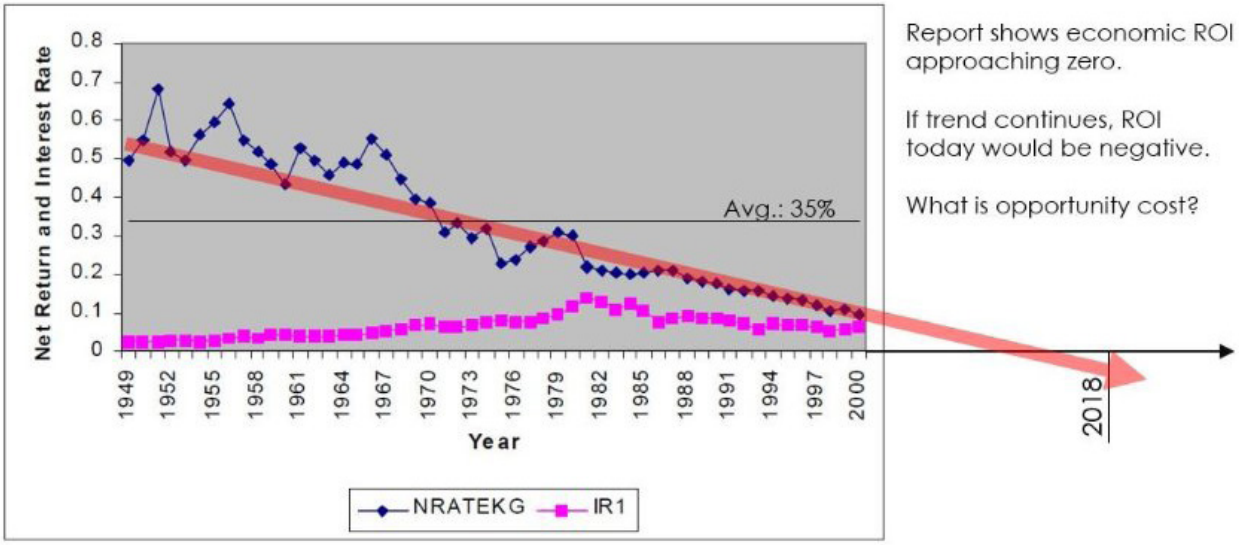
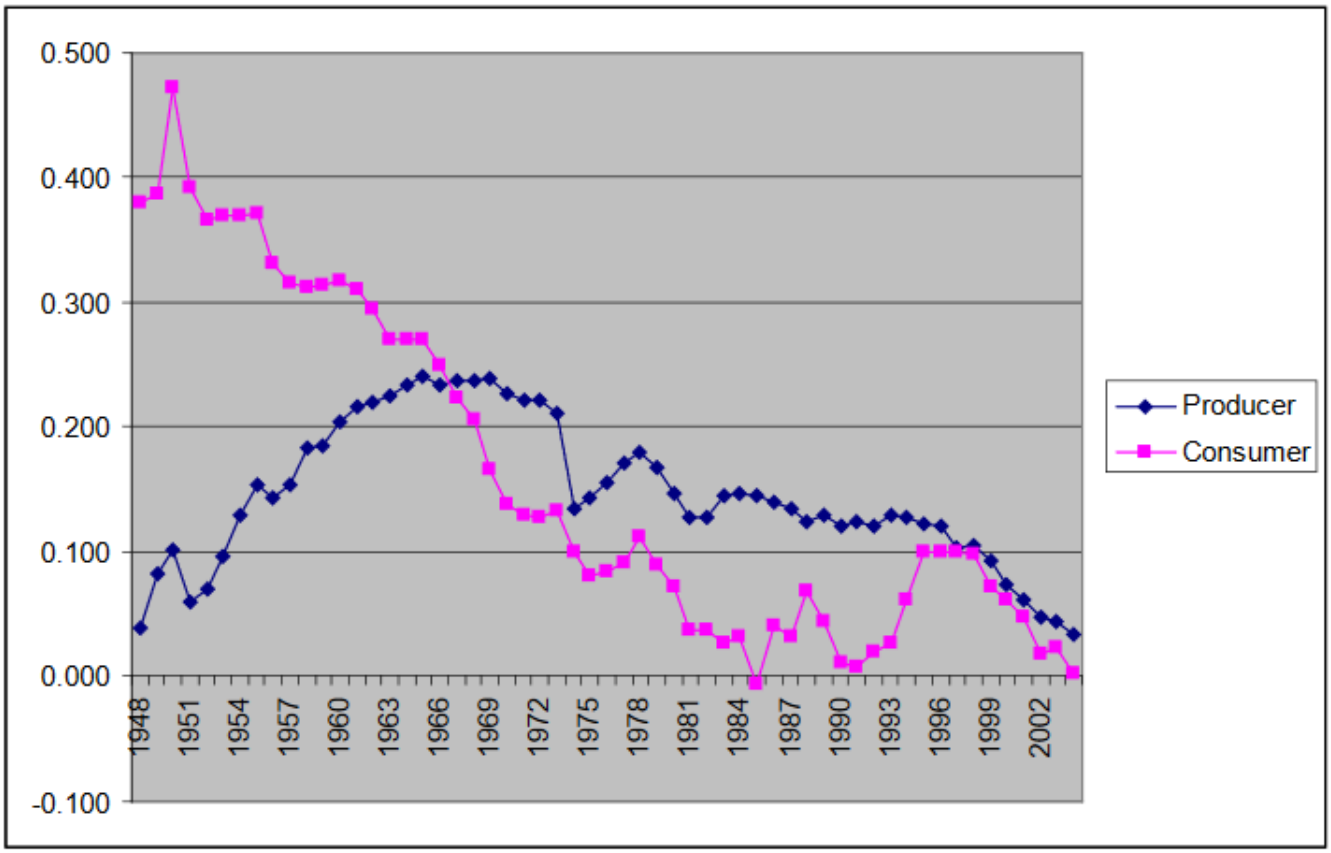



FIG. 1. NET RATE OF RETURN TO HIGHWAY CAPITAL AND LONG TERM INTEREST RATE

Slide by Patrick Kennedy of Space Between Design Studio adapting the chart from Randall Eberts' Analysis of Mamuneas' Data as prepared for the Federal Highway Administration reviewing the rates of return of Federal Highway spending.

Figure 8: Gross Rate of Return of Highways to Consumers and Producers




Source: Author's calculations of Mamuneas's data.

Graph by Randall Eberts' Analysis of Mamuneas' Data as prepared for the Federal Highway Administration reviewing the rates of return of Federal Highway spending for Consumers and Producers..