Attachment B Economic Analysis Memorandum

TECHNICAL MEMORANDUM

Missoula Higgins Corridor

Economic Impacts of Proposed Multi-Modal Improvements

LELAND CONSULTING GROUP	Date	November 2021
	To	Nick Foster, Kittelson & Associates
	From	Brian Vanneman and Ted Kamp Leland Consulting Group

EXECUTIVE SUMMARY

Leland Consulting Group (LCG) was engaged by Kittleson & Associates as part of the Higgins Corridor Plan to provide insights into the **potential economic impacts of making *complete streets*-type multi-modal improvements along Higgins Avenue** between Brooks Street and Broadway in central Missoula on either side of the Higgins Avenue bridge.

- The analysis focused on **two concept alternatives affecting the North of Bridge segment and five alternatives along the South of Bridge segment** of the study area. Improvements to the quality and safety of bicycle paths was a primary thrust of all design options, with potential interventions also including varying combinations of changes to on-street parking and drive lane configurations, along with removal of peak hour turning restrictions. Transit and pedestrian improvements are also considered in all alternatives.

- Higgins is an **important gateway corridor** into downtown, with the Hip Strip shops and restaurants in the road segment south of the bridge and a denser and more varied mix of commercial land uses north of the bridge. Both segments also include multifamily residential as upper floors in vertical mixed-use buildings.

- A thorough **review into the growing body of academic literature** on economic impacts of such improvements (mostly involving studies completed in the past decade in larger cities across the U.S. and Canada, using a variety of approaches to assessing impacts), found that **positive and neutral/inconclusive economic outcomes have been far more common than clear negative effects**. The few studies suggesting negative impacts tended to involve significant parking reductions (as opposed to drive lane removal/conversion only).

- Our analysis of concept alternatives for Higgins finds that the 4-lane concepts for both North of Bridge and South of Bridge, plus the South of Bridge Concept 4 (2-lanes plus bus transit in center lane), are likely to pose a risk of negative economic impacts to Higgins-fronting businesses due to large reductions in on-street parking. The No-Build alternative is also considered negative because it fails to address existing safety concerns and also undermines the potential positive effects of multi-

modal investments either recently completed or planned on either side of the study area corridor by disrupting their continuity.

- In contrast, the analysis suggests that positive economic effects are likely for the 3-lane concept North of Bridge and for all alternatives other than the 4-lane Concept 4 for the South of Bridge segment.

- In short, any concept that avoids significant removal of on-street parking while improving the experience and safety of bicycle, pedestrian, and transit mobility, is likely to help (or at least not harm) overall economic conditions for Higgins-fronting businesses and downtown Missoula in general.

- The report concludes with an appeal to shift the level of focus beyond just parking and travel lane alterations (important as they are) to recognize the potential "big picture" importance of *complete streets*-style upgrades on overall economic vibrancy through **quality-of-life and placemaking** gains. To emphasize this holistic perspective and also highlight the importance of finer-grained details, design, and materials, this report closes with three brief case studies of successful multi-modal improvements in other cities.

CONTENTS

INTRODUCTION: MULTI-MODAL STREET IMPROVEMENTS

Streets have always played a critical role in determining how cities function, not only by making it possible for vehicles to quickly move about town, but in shaping how residents interact with the built environment while in motion and once they've arrived. Recently there has been a surge in interest in some new (and revived) strategies for improving how engineers and planners can better design streets to improve the quality of urban life. There are multiple buzzwords in use -- *complete streets*, *active travel*, *road diets,* etc. – but a common thread is the basic theme that many roadways – especially those running through mixed commercial and residential neighborhoods – have become overly auto-oriented and could benefit from providing more diverse means of accessing homes and businesses and different perspectives on the value that roads can have for cities.

These related approaches aim to shift away from a nearly exclusive focus on the efficient movement of cars from A and B points to a much broader view of all the different uses, users, and benefits of streets, with a viewpoint that considers a wider definition that is not just main travel lanes between curbs, but includes all the elements in play between buildings on either side of the street--pedestrian sidewalks, plantings, loading areas, bikeways, medians, parking spaces, crosswalks, etc.

In terms of physical approach, complete streets redesigns tend to involve some shifting in the amount of right-of-way devoted to auto travel lanes (width or count) or on-street parking. In place of those travel lanes and/or parking spaces, *complete streets*-related designs tend to substitute one or more turn lanes, along with new or expanded facilities for pedestrians, bicycles, and/or transit vehicles (typically in combination with improvements to street markings, signage, streetscape elements, etc.). In other words, these approaches generally aim to make streets more suitable for **multi-modal** use, while still accommodating existing roadway functions, including freight movement

Such changes are sometimes met with concern by business owners on or adjacent to the streets in question. Concerns tend to range from specific losses of nearby street parking (deterring customers and inconveniencing employees) to more general concerns, with some roadway stakeholders seeing any reductions in automobile traffic flow as potentially harmful to business operations.

Proponents of multimodal street improvements counter that the complete streets-style approach is not only beneficial from a mobility standpoint–improving safety and potentially increasing overall flows of people and goods by allowing a wider choice of travel modes--but that it can help increase the overall vitality of the street, strengthening the sense of place and making the surrounding businesses and homes more desirable to shoppers and residents.

STUDY AREA CONTEXT

Higgins Avenue is a critical spine of Missoula's downtown core, providing mobility to the city's center as well as forming a "postcard street" as described in Missoula's Downtown Master Plan. The corridor is already a multi-modal thoroughfare, with pedestrian and bicycle activity happening alongside auto, truck, bus traffic, plus ample ride-share traffic (especially in non-Covid times). Higgins is also anchored on the north end by a freight rail line and interstate highway beyond that.

Facilities to enhance access and safety for non-automobile traffic, however, vary along the length of the downtown portion of Higgins (railroad to Brooks). The north side, between Broadway and the railroad,

features wide sidewalks and protected bike lanes. Further south, between Broadway and the Higgins Bridge, there are on-street bike lanes, albeit located in the "door zone" and are adjacent to vehicle traffic. Left-turn prohibitions and the one-way couplet of Front and Main Streets are in place to regulate traffic flow. These bike lanes, however, currently end at the south end of the bridge. There, along the Hip Strip, dedicated bike lanes disappear, and sidewalks narrow somewhat, though there are still left-turn prohibitions in place.

Safety and access considerations are also affected by the multiple jurisdictions present in the corridor. Highway designations change between Brooks and the railroad: from federal highway system between Brooks and South 5th St on the south (a connection for US Hwy 12), shifting to a state-governed "urban system" ROW north of S 5th Street. North of Broadway, Higgins becomes a locally maintained street. These changing designations make for a more complex maintenance and planning environment, especially as future improvements are being considered.

VISION FOR HIGGINS CORRIDOR MULTI-MODAL IMPROVEMENTS

The City of Missoula's plan for the Higgins Corridor comes from the general "complete streets" school of thought – shifting from a heavily auto-oriented, largely functional approach to one that better accommodates and encourages pedestrians, bicyclists, and mass transit users, by enhancing multi-modal facilities and amenities along Higgins Avenue south of the bridge. Consistent with the concept of complete streets, the idea is that such improvement can create more attractive, safer, and more pleasant environments for people to spend time in. On the assumption that people will spend more money where they spend more time, improvements to economic vitality should naturally follow.

The Higgins Bridge is currently undergoing a Major Rehabilitation including the addition of high-quality bicycle and pedestrian facilities, strengthening the important gateway into the heart of downtown. However, without changed and/or added facilities, unsafe conditions and challenging non-automobile access will persist on both the north and south sides, between Broadway and Brooks St.

One of the primary goals of the Downtown Master Plan is to create a truly multi-modal corridor that is connected along the entire length of Higgins through downtown and the Hip Strip. At the same time, redevelopment along the corridor will require a close look at connectivity of all modes, from people biking and walking, transit, and vehicle access. Parking will continue to be a challenge, necessitating consideration of how on-street parking may supplement future structures or district scale parking strategies.

Vision statement as shown on the project's web site: *(https://www.engagemissoula.com/higgins-avenue-corridor-plan*

> *"The goal is to create a modern transportation system that enhances the economic vitality of the corridor and serves as a gateway to downtown Missoula.*
>
> *The Higgins Corridor Study will develop a design that:*
> - *Considers the needs of all users, including people biking, walking, driving, and riding the bus, freight operators, and others.*
> - *Improves safety for all users.*
> - *Provides multi-modal access suitable for all ages and abilities.*
> - *Increases access to businesses on the corridor and Downtown Missoula."*

To emphasize the critical roles of placemaking and practical considerations in ensuring positive impact on economic vitality, we would suggest the following two additions:

- *Engages the community by enhancing the appeal of Higgins as a place for people to visit and enjoy spending time.*
- *Is logistically and financially feasible.*

The project is thus an outgrowth of the Downtown Master Plan, which states that "transforming Higgins Avenue into a fully multi-modal and safe street is essential for economic, physical and social health of the entire city." The Downtown Plan also emphasizes that "the [Higgins] corridor plan will be critical to successful implementation of the Front/Main Two-Way Conversion and the Brooks Corridor TOD study."

Because the City recognizes the importance of Higgins Avenue for economic and social aspects of the downtown in addition to transportation, the continued success of its commercial establishments is rightly viewed as a key project goal.

The analysis summarized here is part of the City's effort to ensure that economic well-being is given sufficient consideration in the design and planning of multi-modal improvements to this stretch of Higgins Avenue. To that end, we followed two main tacks in assessing the likely impacts for Missoula: 1) a **broad academic literature review** of economic impacts of multi-modal street improvements, and 2) a **Higgins-specific analysis** focused on the particulars of the design alternatives under consideration, local economic trends, and the nature of the specific businesses in the study area.

LITERATURE REVIEW

For a broad perspective on how street changes can affect local economies, we surveyed the body of recent, relevant academic literature into whether and how multi-modal street improvements tend to impact the economic health of businesses in the immediate vicinity of those improvements. These studies have become more plentiful in recent years and now cover a fairly wide variety of case environments across the U.S. and Canada. Not surprisingly, the research ranges substantially in study design quality and quantitative rigor, but the growing variety of approaches, key metrics, and urban contexts now represented help to improve the usefulness and potential applicability to Missoula.

Although many extoll the potential positive economic effects of complete streets-type efforts on local business, our review of the available research attempts to find support for a more modest claim, with a "null hypothesis" that multi-modal street improvements should at least be expected to *do no economic harm* to the surrounding area

Economic Impacts for Projects Involving Parking or Travel Lane Modifications[1]

A very recently published round-up of available research looked at the 23 original studies that made some attempt to quantify an economic impact to local businesses following the installation of bicycle or pedestrian facilities. The research involved a total of 45 unique facilities in 16 cities in the US and Canada and covered 35

[1] Complete streets efforts do not necessarily involve major modifications to travel lanes or on-street parking. Because all concept alternatives remaining for Higgins do require such modifications in varying degrees, we chose to focus on the body of published studies that explicitly considered removal of parking and/or drive lanes as part of the multi-modal improvement design.

different bicycle facilities, six pedestrian facilities, and four mixed facilities with both pedestrian and bicycle infrastructure. While the selected studies all involved some serious attempt to detect economic and business impacts by one or more quantitative metrics, there was considerable variability in terms of research design and the quality and reliability of data used, with some studies using independent third-party data such as sales tax revenues or commercial rents and others relying on surveys of business owners and visitors (facility users and/or customers).

The exhibits below attempt to assemble the various findings into three groupings: studies involving travel lane removal or reduction, those involving significant removal of on-street parking, and those with both travel lane and parking reductions. We assigned studies to one of five categories based on summary findings:

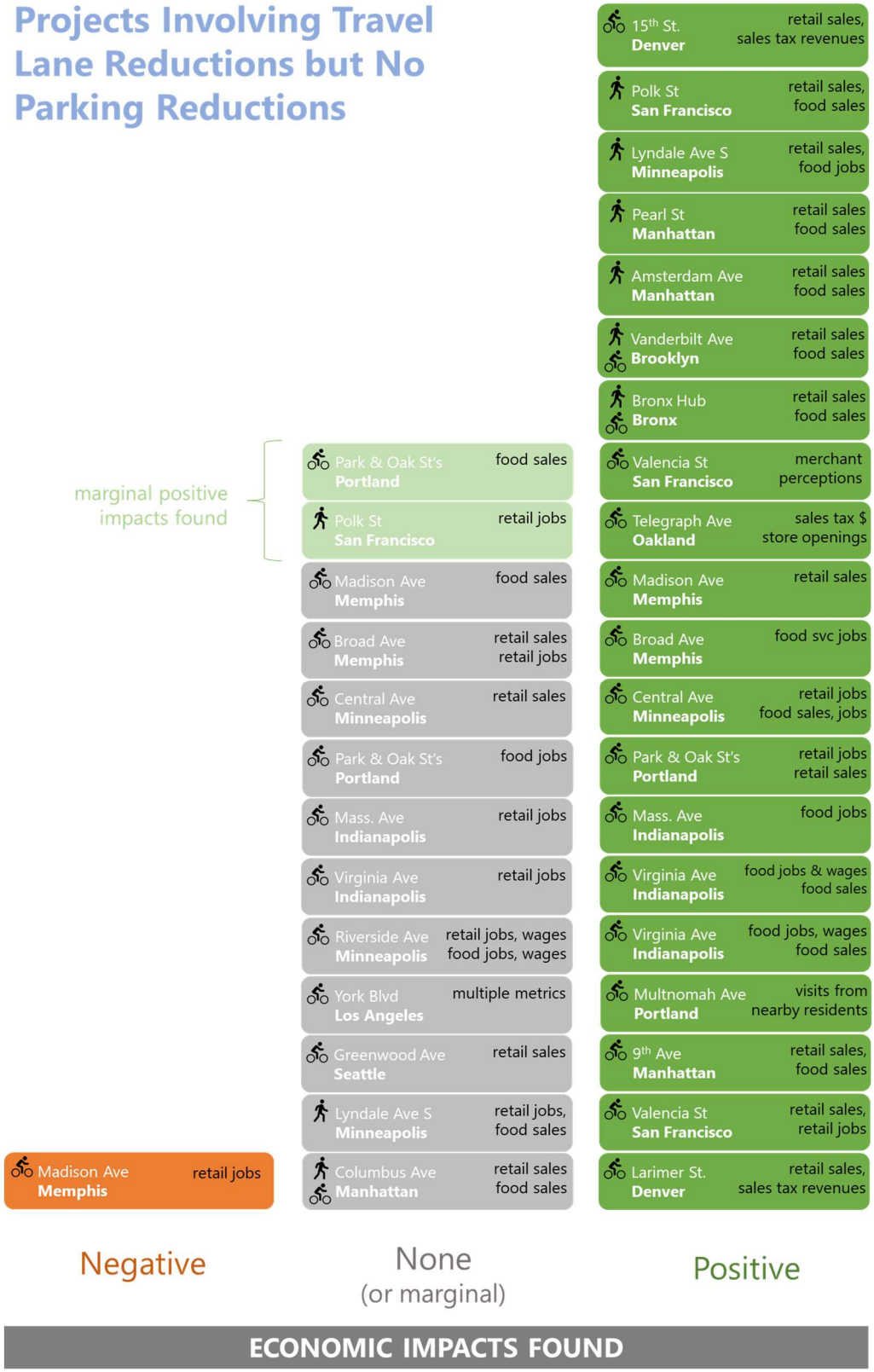
- **Negative** (where statistically significant negative impacts were reported),
- **Marginal Negative** (possible harmful impacts, but lack of statistical significance, mixed findings, or other author reservations)
- **None** (no significant positive or negative impacts)
- **Marginal Positive** (possible positive impacts)
- **Positive** (statistically significant positive impacts)

Each symbol represents a city and street for which separate findings were reported. If multiple streets were combined (averaged) as part of the study findings, multiple streets are labeled on the symbol. When findings were mixed across different metrics for a given city/street project, those are separated into one symbol for each metric for which a different result was found. An icon shows the type of facility (bike, pedestrian, or combination), and performance metrics are listed on the side.

Figure 1 summarizes findings from complete streets-type projects where one or more travel lanes were narrowed or removed to make room for enlarged or improved bicycle or pedestrian facilities –often in conjunction with creation of a turn-only lane. Most involved removal of one travel lane only, although the Memphis, Los Angeles, and Oakland projects each required removal of two travel lanes. **Importantly, none of the projects researched in this group involved significant reductions to on-street parking**. The graphics exclude four studies mentioned in the Volker and Handy paper because of a lack of documentation of parking or travel lane reductions.

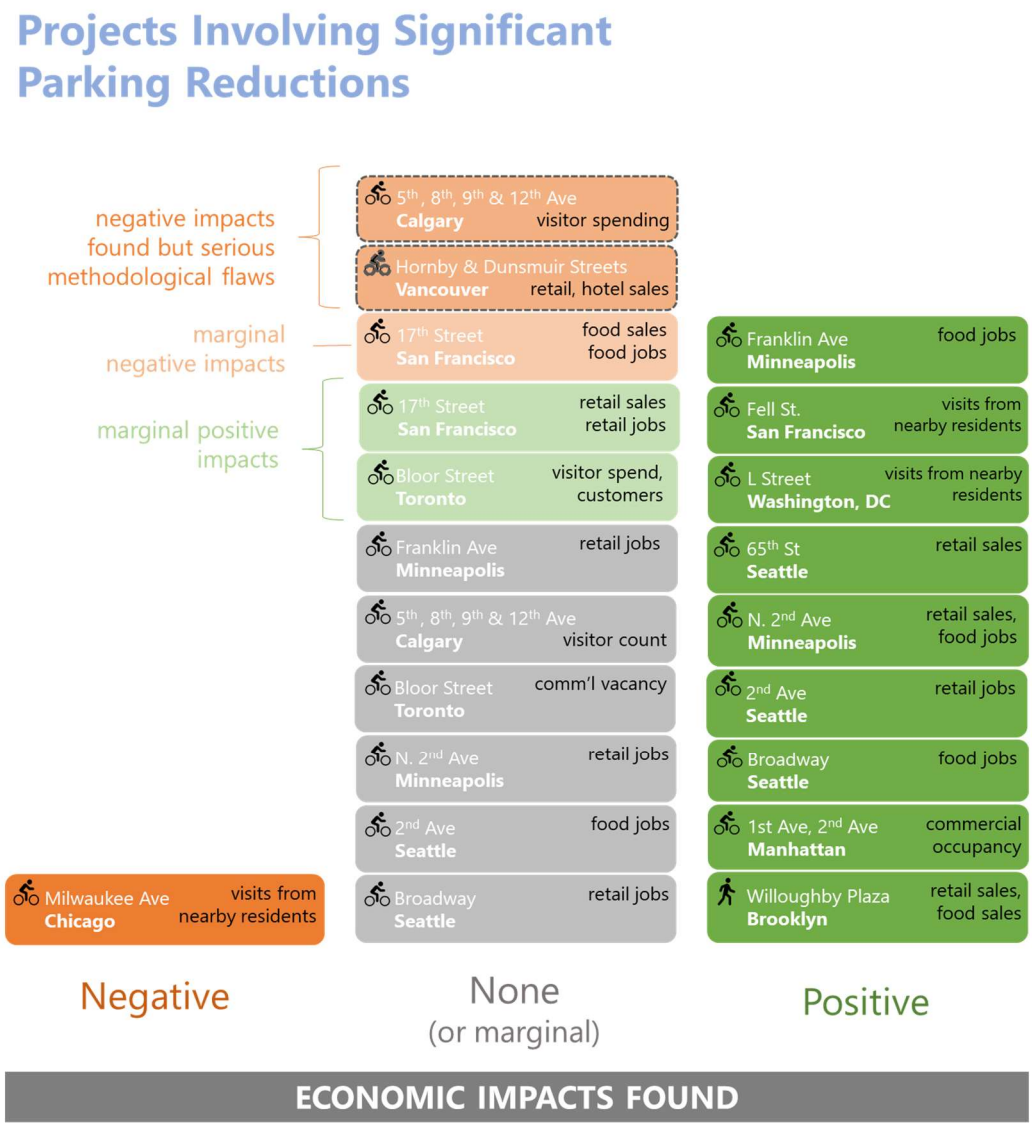
As shown, most economic impacts were significantly positive and almost all were at least neutral. Only the Madison Avenue project in Memphis produced a negative result (a decline in retail employment for the project vicinity), although that same study found no impact on food (restaurant) sales and a positive effect on retail sales. Clear positive findings included projects with bicycle improvements, pedestrian facilities, and combination bike/ped improvements.

Figure 1: Economic Impact Studies (Bike/Ped Projects Without Significant Parking Reductions)



Source: Jamey M. B. Volker & Susan Handy (2021) https://doi.org/10.1080/01441647.2021.1912849; and Leland Consulting Group

Figure 2: Economic Impact Studies (Bike/Ped Improvements Involving Parking Reductions)



At a glance, findings of economic impacts for projects involving parking reductions appear much more mixed, with ten examples of marginally positive or positive findings and four examples of at least marginally negative results. As noted in Figure 2, however, the Canadian studies for which negative results were reported had some notable methodological shortcomings:

- For the Calgary projects (involving addition of two-way bicycle lanes for four major downtown streets stretching over four miles in total) the "visitor spending" metric was based on intercept surveys of pedestrians (not necessarily cyclists or customers arriving by car) before construction and one year after completion of the bike tracks. Sampled pedestrians in both periods were asked to recall the "average amount per month" they spent on that street–a difficult task for a questionable choice of respondents. Additionally, the "post-" surveys were conducted during a regional economic slump due to falling oil/gas prices.

- In Vancouver, the impact study was conducted by engineering firm Stantec at the request of business owners in opposition to the street changes. Measures of estimated hotel sales and retail spending were based on survey questionnaires collected over a one-month period, asking business owners (including many of those who had requested the study) to estimate the change in sales they had experienced since the construction of the bicycle facilities. In the few cases where actual sales data was obtained to compare with survey results, negative impacts were not as large as had been reported in the survey. In addition to these methodological problems, the Vancouver study also involved one of the most extreme examples of parking reduction, with 156 street parking spaces removed to make way for the two-way bicycle tracks on Hornby Street.

Research quality issues notwithstanding, projects involving removal of parking, either in conjunction with travel lane removal (next chart) or not, did not have the same strong positive-skewing track record in terms of impacts measured by published studies. Not surprisingly, parking removal tends to be the most common concern of project-adjacent business owners.

Overall, this body of research suggests that creating or improving active travel facilities generally has positive or non-significant economic impacts on retail and food service businesses abutting or within a short distance of the facilities, though certain bicycle facilities showed some evidence of negative economic effects on auto-centric businesses (like gas stations, auto repair shops, auto parts stores, and large home-goods stores). The results were similar regardless of whether vehicular parking or travel lanes are removed or reduced to make room for the active travel facilities.

Spending Behavior by Travel Mode

A smaller body of academic research has focused not on impacts of specific facilities, but on the different levels of spending for consumers traveling by bicyclists, pedestrians, and/or transit users, as compared to those traveling by car. A round-up of 11 academic studies conducted in six cities on the topic is mixed. There is some suggestive evidence that cyclists and pedestrians may spend as much or more than motorists in the right settings.

For instance, a recent study from a smaller California city (Davis) found that cyclists spent marginally more on average on downtown retail purchases than motorists (but only when excluding food/beverage spending and business services). In Portland, a 2013 study found significantly higher spending by cyclists and pedestrians at restaurants, bars, and convenience stores – although that group was outspent by motorists at grocery stores.

However, the research taken as a whole is not clear. Active travelers do not appear reliably spend more or less per trip in urban downtowns or retail corridors than those arriving by car. Once again, results could be interpreted as support for the idea that adding a bicycle or pedestrian facility to an urban downtown or retail corridor would not likely reduce consumer spending at local businesses –especially for restaurants, bars, and smaller retail stores – unless it reduced more motorist trips to those businesses than the number of additional cyclist and pedestrian trips it generated.

Other Economic Development Benefits of Bicycle and Pedestrian Improvements

Though the evidence has been more anecdotal than the published studies shown above, the potential for bicycle amenities and other multi-modal street improvements to positively affect economic development is being increasingly recognized. Cases in multiple cities suggest that the contribution of bike lanes and related

complete-streets efforts can improve broader quality-of-life perceptions that can help attract employers looking to expand – especially with a young or fitness-conscious employee base.

Three recent examples have garnered some local and national press attention and testimonials from executives:

- The major Midwest advertising firm Colle+McVoy recently relocated to downtown Minneapolis. The firm's CEO, Christine Fruechte directly cited multi-modal benefits, saying "the move allows our employees to take advantage of the area's many trails and to **put the office in a more convenient location for commuting by pedal or foot**. Our employees are healthier, happier, and more productive. We are attracting some of the best talent in the industry."

- Austin, Texas, has ambitiously expanded its bike infrastructure, becoming one of the nation's leaders in protected bike lanes. Cirrus Logic, a tech firm, moved downtown several years ago. Public Relations Director Bill Schnell said "the area's **new bike trails and protected lanes made the company more attractive as an employer**. We can't just pluck anybody for our jobs. The people we want are mostly younger, and biking is part of the equation for them."

- In Memphis, Steven J. Bares, Ph.D., president of the Memphis Bioworks Foundation, a healthcare expansion initiative, says that their organization's move to Memphis was based, at least in part, on that city's bike lane expansion effort. "My job is to convince emerging companies that they can get the workers they want to come here. **The bike is part of the overall strategy to compete for talent**,"

Because there are no quantitative studies to date on the effects of bicycle and pedestrian infrastructure and business recruitment and retention, it is not possible to say how common these kinds of success stories are, what types of businesses are likely to be attracted by such amenities, or what the cost-benefit relationship is between multi-modal investments and economic development return. That said, with its attractive mountain setting, riverfront setting, and strong university presence, Missoula is already well-positioned to attract workers and families that place a high value on outdoor fitness and robust green transportation infrastructure.

Potential BRT Impacts

The concept alternative still under consideration for Higgins place heavy emphasis on bicycle and pedestrian accommodations, with many improvements to how those travel modes will interact with automobile traffic. In addition, two remaining design alternatives contemplate the addition of a fully or partly dedicated transit lane running alongside bike and auto traffic. That lane would be used as an extension of the Mountain Line bus rapid transit (BRT) route proposed for the Brooks Street diagonal corridor, providing the final connection for that route into downtown Missoula.

There are 30-50 lines in operation now in approximately 20 cities across the U.S., with roughly the same number in some stage of planning or construction. The number is uncertain in part because the characteristics distinguishing BRT from various forms of enhanced bus transit are subject to some debate. There is now an adopted point system for classifying BRT system quality based on the extent to which the system incorporates attributes like exclusive lanes, traffic priority, on-board fare collection, platform-level loading, etc. Despite the recent proliferation of BRT lines in the U.S., there is little in the way of solid

quantitative evidence relating BRT to positive economic effects. Considerable anecdotal evidence has been amassed (especially by pro-BRT organizations) to show that such systems, like light rail, can be associated with very successful corridor revitalization programs involving transit-oriented development typically clustered around station areas.

Applicability of Academic Research to Higgins

The body of academic research into the economic impacts of bicycle and pedestrian roadway improvements has expanded considerably in the past decade, now including analysis of dozens of facilities generally fitting the description of "complete streets" efforts like what is contemplated for downtown Missoula. Recent additions to the evidence are potentially quite helpful in trying to predict economic consequences of facilities similar to what contemplated for the Higgins Avenue project. However, before applying those findings to the Missoula case, it is worth stating three main caveats:

- It is very **difficult to establish causality** between bike/ped improvement projects and economic outcomes. Such projects are typically part of some broader effort that includes other coordinated changes: physical interventions, policy changes, real estate developments, marketing efforts, etc. Even a stand-alone multi-modal street improvement project takes place in an inherently complex urban environment with many competing factors interacting to influence business performance. Control comparisons are helpful, but there are never perfectly comparable streets or districts.
- Most of the available academic research was conducted in considerably **larger and more densely urbanized cities than Missoula**. Such places tend to have more experience with alternative modes of travel (walking, biking, taking transit), even when such modes may be new to the streets in question.
- Studies of the type just outlined **tend to look to aggregated corridor-wide data**, such as average change in retail sales for stores along a project street, to arrive at summary conclusions about impacts. Aggregated/averaged performance metrics can be helpful in predicting the directionality of impacts (e.g., mainly positive, mainly neutral), but **can potentially overlook significant negative impacts that may occur at the individual establishment level**. In other words, a new bike path could have generally positive impacts when averaged across all businesses on the street, but one store adjacent to disproportionate parking losses, say, might still suffer a loss in performance.

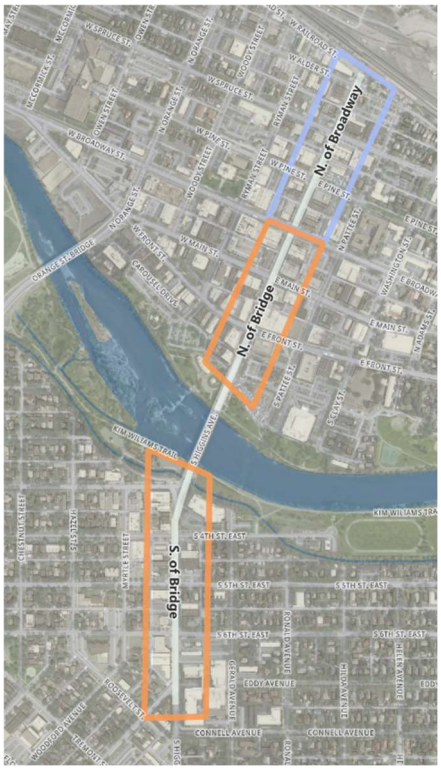
The first two caveats above should be a grain of salt kept in mind while applying the generally positive implications of the research to date on the subject. The third caveat should be actively considered and mitigated by careful attention to design decisions that could place an undue burden on a small minority of corridor businesses, even if likely helpful to the corridor overall.

ECONOMIC IMPACTS FOR HIGGINS ALTERNATIVES

Study Area Segments

The discussion of potential economic impacts for the considered alternatives in the project study area will generally involve two sections of Higgins Avenue, referred to as:

- **South of Bridge** (from approximately Brooks Street on the south to the bridge on the north.
- **North of Bridge** (from the northern edge of the bridge on the south to Broadway on the north)

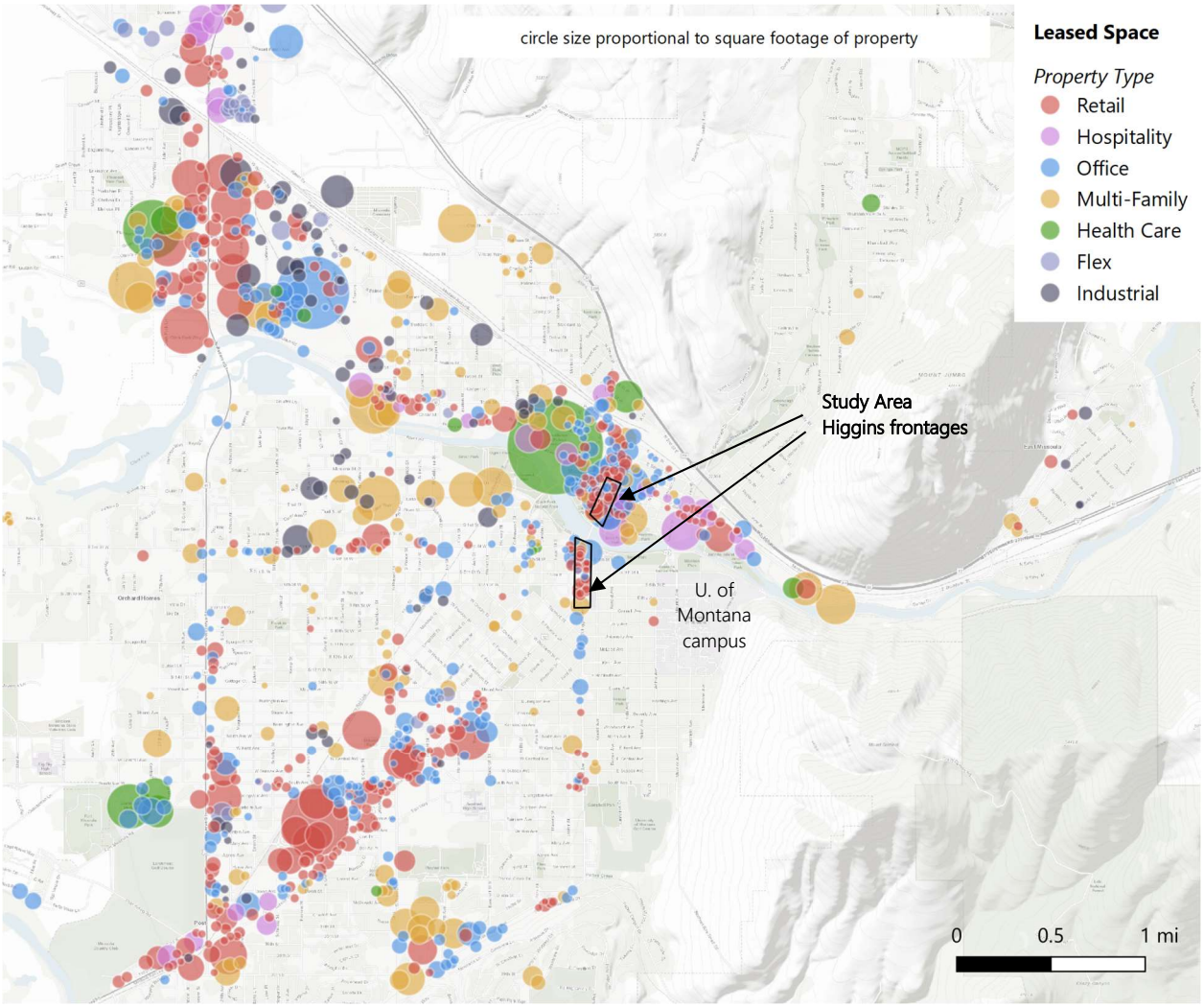


The two areas are roughly equal in length, but have some important differences, as shown in the table and cross-section sketches below. Another portion of Higgins Avenue, referred to here as North of Broadway is used as a comparison segment for some discussion points, since it is physically and economically similar to the study area, but has already had some recent multi-modal improvements of the type generally being considered for the study area.

Commercial Real Estate Context

The Study Area part of an important transportation and commercial spine for downtown Missoula and the immediate vicinity. While the North of Bridge segment is in the southern heart of downtown, the South of Bridge area is more on the downtown periphery, but closer to the university campus area.

Figure 3: Citywide Commercial Real Estate Context

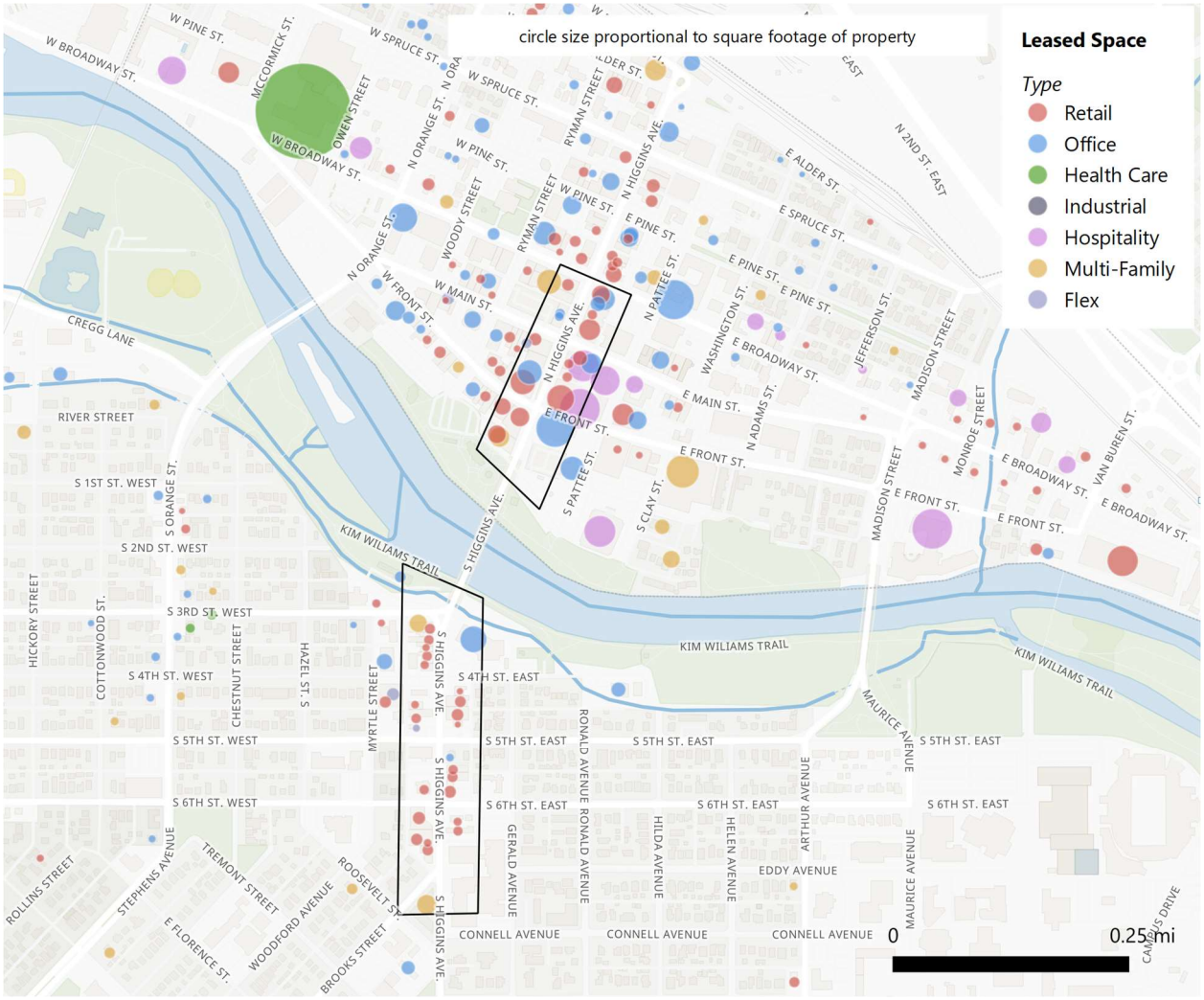


Source: Costar, and Leland Consulting Group

The citywide map of commercial and multifamily apartment inventories shows the North of Bridge study area segment in the heart of the downtown Missoula commercial cluster –a diverse collection of high-value land uses. The South of Bridge segment is less squarely in the middle of the downtown activity zone, but together with the northern segment it forms a retail-heavy gateway bridging (literally) the southern portion of Missoula with its older core district. Though the retail uses on Higgins are dwarfed by the auto-centric power centers and malls spread along Brooks and Reserve to the south and west, they are still sizeable, and arguably of greater importance to the core identity of Missoula as a unique place.

As shown in the following, more zoomed-in map of leased space, the North of Bridge study area segment is characterized by more development intensity and a greater variety of commercial land uses, relative to the South of Bridge segment. Though less densely developed, the South of Bridge segment is a vibrant commercial environment (Missoula's "Hip Strip") with storefront retail shops interspersed with restaurants and bars.

Figure 4: Central Missoula Commercial Real Estate Context

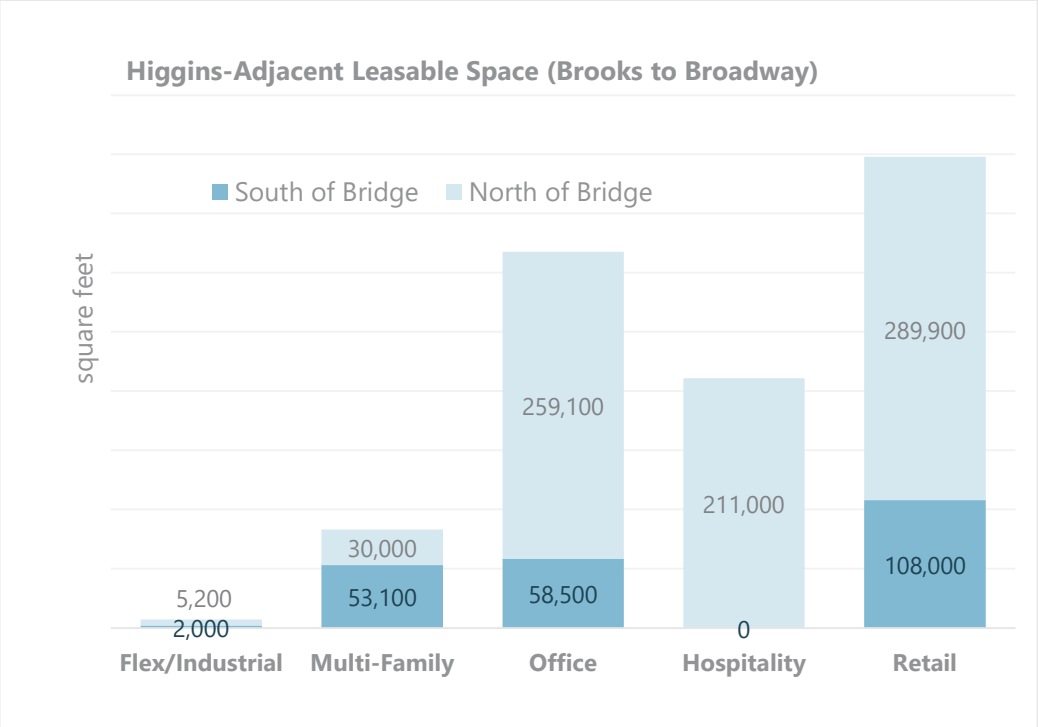


Source: Costar, and Leland Consulting Group

Both segments include numerous examples of vertical mixed-use development, typically involving storefront retail on the ground floor with residential or office on the floors above. The far southern portion of the South of Bridge area has a newly built three-story condominium project with approximately 25 units and a portion of the ground floor marketed as creative office space. Many of the residential units are being leased as short-term rentals (e.g., AirBnB, VRBO). Other short-term rentals can be found among the condominiums on the upper floors of the Wilma Theater redevelopment at the southwest end of the North of Bridge area.

Significant public-sector uses (not pictured) include Hellgate High School, on the east side of Higgins at Brooks Street, and the Missoula Senior Center at the southwest corner of 5th Street and Higgins (which includes a basement-level thrift store) – both within the South of Bridge segment.

Figure 5: Existing Higgins-Adjacent Real Estate Comparison



Source: Costar and Leland Consulting Group

Note: Although the project Study Area includes a wider buffer around Higgins Avenue, the chart above focuses on real estate directly adjacent to Higgins – that most likely to be directly impacted by any changes to the right-of-way area.

Though the Hip Strip has a reputation as a hub for shops and restaurants, those tend to be smaller in scale. In fact, as shown in the chart above, the North of Bridge portion of the study area includes almost three times the square footage of Higgins-adjacent retail as the South of Bridge segment. Across both segments, retail is the predominant private-sector land use fronting Higgins, followed by office and hospitality (North of Bridge only). Both areas include a moderate amount of multifamily real estate in the form of upper-floor apartments in vertical mixed-use redevelopments of historic commercial buildings.

Though we have not quantified it here, Higgins almost certainly has a higher proportion of local and independent retailers (as opposed to regional or national chains) relative to retail zones on South Brooks or Reserve – a distinction that adds to its place-making importance. While local/independent retail adds to character, it can sometimes be less resilient in the face of economic pressures (without a corporate mothership to absorb losses during a downturn, for example).

Business Establishment Input: Desired Changes and Concerns

The Higgins Avenue project has included multiple rounds of stakeholder outreach to date. During that process, different property owners/managers representing a variety of commercial establishments in the corridor have expressed both excited optimism and concern about potential negative business impacts.

Although a diverse group, business owners tended to agree on the following goals:

- Improved safety
- Improved multi-model access

- Removal of left-turn prohibitions

Among those with concerns, comments have focused chiefly on the following:

- Reduced on-street parking
- Loss of auto access to internal parking
- Increased auto congestion and other driving inconveniences

Of these, parking tends to be the chief concern. Many corridor establishment owners worry that any nearby loss of street parking spaces will directly impact their ability to attract customers, who are accustomed to relatively convenient, inexpensive or free street parking. Some also voiced concern that employee retention, already a concern in an environment of low unemployment and high housing costs, might be made even more difficult if some employees were unable to find nearby street parking.

Many stakeholder comments were made on the theme of safety concerns, with some concept alternatives appearing either too novel or crowded for different modes, potentially causing conflict across modes, or even leading to increased injury accidents that could be both bad in general and bad for business. At least one stakeholder noted a concern that there could be an increased chance of conflict/congestion between bike and pedestrians in front of busy stores. This analysis does not address potential safety differences across alternatives, leaving that as a problem to be solved via traffic engineering and environmental design (signage, wayfinding, etc.). We assume no major safety differences across build alternatives (but do assume that any build scenario would be at least as safe, if not safer than a no-build scenario).

Physical/Transportation Existing Conditions

Existing Rights of Way, Automobile Movement

Both study area sections of Higgins currently have four automobile travel lanes with no turning lane, and both are able to accommodate bicycle traffic. The North of Bridge paved curb-to-curb right-of-way is already approximately one lane -width (11 feet) wider than south of the river, and the northern segment has wider sidewalks – 6.5 feet wide in the South of Bridge segment versus 10-foot widths in the North segment.

Existing Bicycle Accommodations

Bicyclists in the North of Bridge area have a dedicated lane in both north and south directions, running between the outer auto travel lane and the parallel parking lane. The marked bicycle paths for cyclists running both directions on the South of Bridge segment are technically "sharrows" meaning that riders must share right of way with cars in the outer drive lanes.

Figure 6: Existing Study Area Cross-Sections

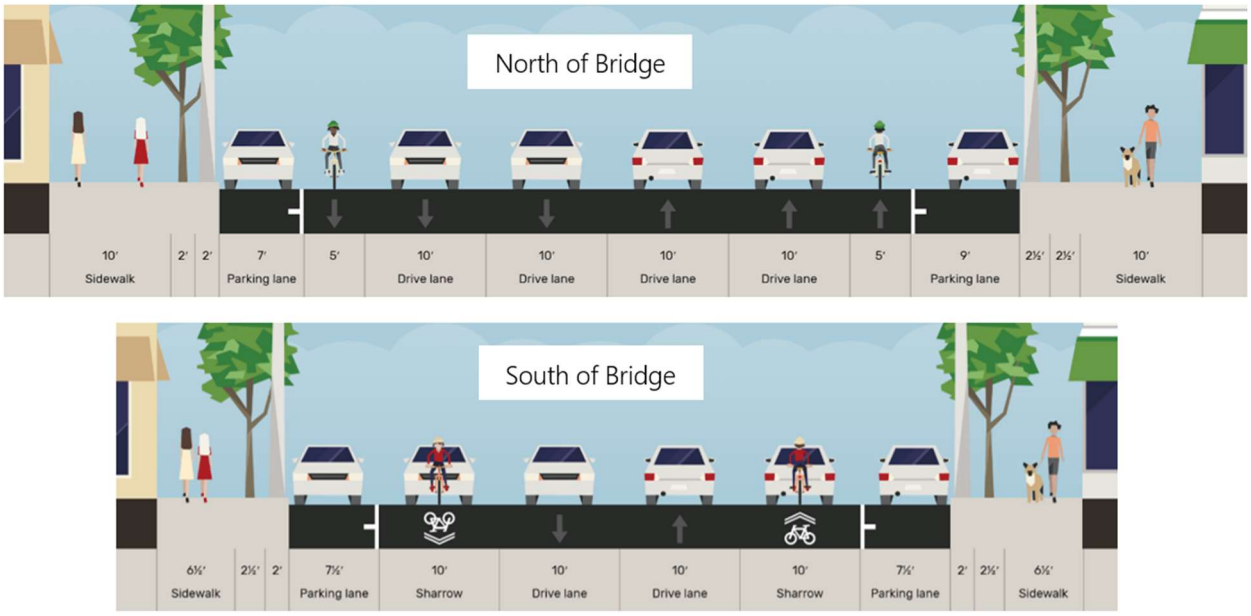


Figure 7: Comparison of Existing Street Attributes

Segment	Auto Travel Lanes	Curb-to-Curb ROW	Bicycle Treatment	Pedestrian Treatment	Parking
North of Bridge	4	66 ft.	1 5-ft. dedicated bike lane each direction, between parking lane and travel lane Plentiful bike locking stations	10-ft. sidewalk in front of buildings on either side of street, with 4-5-ft strip for street trees and lighting separating sidewalk from parking lane.	52 parallel spaces 7-ft wide on west side, 9-ft on east
South of Bridge	4	55 ft.	1 marked lane in each direction sharing ROW with auto traffic (this bike lane treatment is referred to as a "sharrow" Plentiful bike locking stations	Same as North, but sidewalks are narrower (6.5-ft.)	46 parallel spaces 7.5-ft wide parking lane on both sides of street

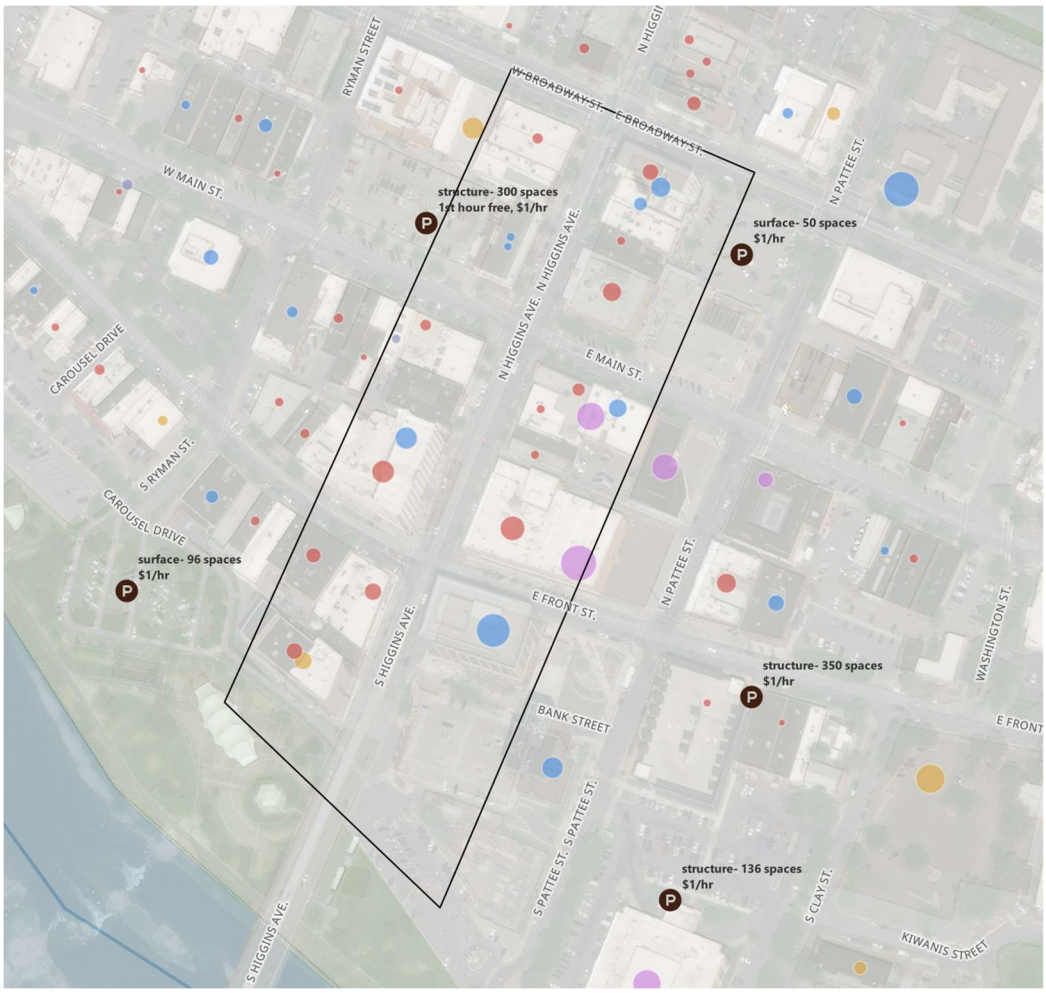
Existing Parking

On-street parking accommodations are similar on both sides of the river, with both Study Area segments having close to 50 existing parallel parking spaces. Parking is free on the street south of the river and is free or inexpensive north of the river (either on-street with payment at pay-stations or in public lots or garages). A few businesses in both North and South segments have small private parking lots, typically to the front or side. Private surface parking lots are more common one block off Higgins on either side (Platte Street and Ryman Street).

The more densely developed North segment includes at least four paid parking lots, two garages and two surface lots, each with parking free for the first hour and $1 per hour thereafter. There are no paid parking lots serving the South of Bridge segment, as of this analysis. Lot locations are shown in the map below.

While the presence of multiple paid parking lots and garages adds some flexibility that may lower the likelihood of negative impacts for Higgins concepts involving parking removal, that potential mitigating effect is tempered by the fact that, in general, there is much higher parking demand to begin with in and around the North of Bridge segment of Higgins. Arguably, a prospective customer looking for street parking south of the bridge is probably much more optimistic about the odds of finding a convenient spot than one looking to park north of the bridge.

Figure 8: Major Paid Parking Lots, North of Bridge



Comments on Design Alternatives

For each remaining design alternative, we discuss expectations for potential impacts, related to the project overall and to individual design components. Particular attention is paid to five main categories of change with the potential to cause impacts:

- addition of pedestrian and bicycle traffic,
- addition of ped/bike-friendly streetscape, signage, markings, etc.

- addition of mass transit (including enhanced bus or BRT)
- reduction or removal of travel lanes, and
- removal or relocation of on-street parking,

The design alternatives for the corridor are still being actively considered and refined, so although the following discussion refers to specific concept attributes, the particular attributes and exact concept configurations may change somewhat from what is shown.

As of this technical memo, there are two main build alternatives under consideration for the project area north of the bridge and four build alternatives south of the bridge. Those are profiled below in a table focusing only on those design elements likely to have some relationship to economic performance of surrounding establishments.

Figure 9: North of Bridge Alternative Attributes and Potential Economic Effects

Shading reflects potential economic effects of each attribute:	*negative*	*weak negative*	*neutral*	*weak positive*	*positive*

	Current No Build	**3-lane Alternative**	**4-lane Alternative**
Sidewalks	10 ft	10 ft	10 ft
Other Pedestrian Design Features	TBD	TBD	TBD
Travel lanes (auto)	4	2	4
Turn Lane	No	Yes	No
Turn Pockets (Left Turns)	No	No	No
Left Turns Allowed?	No	Yes	No
Parking			
Change in Spaces	52	-1	-24
Lanes	2	2	1
Bike Facilities			
Shared with Cars	No	No	No
Dedicated	Yes	Yes	Yes
Protected	No	Yes	Yes
Transit: Dedicated Lane(s)	No	No	No

Figure 10: South of Bridge Alternative Attributes and Potential Economic Effects

		Alternatives					
	Current No Build	**1A**	**1B**	**2A**	**2B**	**3**	**4 BRT**
Sidewalks	6.5 ft	6.5 ft	6.5 ft	6.5 ft	6.5 ft	6.5 ft	6.5 ft
Other Pedestrian Design Features	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Travel lanes (auto)	4	2	2	3	3	4	2
Turn Lane	No	No	No	Yes	Yes	No	No
Turn Pockets (Left Turns)	No	No	Yes	No	No	No	No
Left Turns Allowed?	?	No	Yes	Yes	Yes	No	No
Parking							
Spaces (change)	46	-3	-9	0	0	-46	-8
Lanes	2	2	2	2	2	0	2
Bike Facilities							
Shared with Cars	Yes	No	No	No	No	No	No
Dedicated	No	Yes	Yes	Yes	Yes	Yes	Yes
Protected	No	Yes	Yes	No	Yes	Yes	Yes
Transit: Dedicated Lane(s)	No	No	No	No	No	No	Yes

Figure 11: Verbal Description of Likely Economic Impacts by Alternative

Concept Alternative	Parking Space Changes	Drive Lane Changes	Bike/Ped Changes	Nature of Likely Economic Impacts (qualitative)
North of Bridge 3-lane	1 of 52 removed	• 2 lanes removed • 1 turn lane added	• Bike lanes (both directions) moved from dedicated lane between parking and drive lanes to sidewalk-level 6-ft. lanes.	• Drive lane changes may divert some commuting traffic but unlikely to reduce shopping visits • No parking impacts • Raised bike lanes could improve customer experience by increasing safety and atmosphere • Addition of planting strip is nice added buffer as ride-share drop-offs increase
North of Bridge 4-lane	24 of 52 removed	• No lanes removed	• Bike lanes (both directions) moved from dedicated lane between parking and drive lanes to sidewalk-level 6-ft. lanes.	• Through-traffic, including both bike and car commuting could increase, but… • unlikely to encourage shopping or improve atmosphere, sense of place • Substantial parking losses risk harming establishments on Higgins (especially the more auto dependent) • Addition of planting strip is good added buffer as ride-share drop-offs increase

Concept Alternative	Parking Space Changes	Drive Lane Changes	Bike/Ped Changes	Nature of Likely Economic Impacts (qualitative)
South of Bridge 2-Lane (Concept 1A)	Net add of 2 spaces to 46 existing (removes 3 scattered spots but adds 5 on east side, south of 6th)	• 2 lanes removed • Potential for mini-roundabouts at 4th St & Brooks St	• Bike lanes (both directions) moved from mixed-traffic sharrows to sidewalk-level lanes separated from curb by 2.5-ft buffer	• Parking additions south of 6th may help fly shop and laundromat (unless taken by high schoolers) • Raised bike lanes could improve customer experience by increasing safety and atmosphere
South of Bridge 2-Lane with Turn Pockets (Concept 1B)	Net loss of 4 of 46 spots (adds 5 on east side south of 6th but loses 9 scattered spots)	• 2 lanes removed • Adds turn pockets at 5th St and 6th St	• Bike lanes (both directions) moved from mixed-traffic sharrows to sidewalk-level lanes separated from curb by 2.5-ft buffer	• Parking losses minimal • Raised bike lanes could improve customer experience by increasing safety and atmosphere • Roundabouts could be good if well-executed, but may require ramp-up in familiarity (for all modes) • Pocket turns add opportunities for enhanced placemaking via art or plantings but must be well-placed.
South of Bridge 3-Lane (Concepts 2A & 2B)	Net add of 2 spaces to 46 existing (removes 3 scattered spots but adds 5 on east side, south of 6th)	• 2 lanes removed • 1 center turn lane added	• In 2A, bike lanes (both directions moved from mixed-traffic sharrows to street-level dedicated lanes running between the outer drive lane and parking lane • In 2B, bike lanes are moved from sharrows to sidewalk-level lanes separated from curb by 2.5-ft buffer	• Parking additions south of 6th may help fly shop and laundromat (unless taken by high schoolers) • Raised bike lanes could improve customer experience by increasing safety and atmosphere (in 2B) • Addition of planting strip (in 2B) is nice added buffer as ride-share drop-offs increase
South of Bridge 4-lane (Concept 3)	46 of 46 removed	• No drive lanes removed	• Bike lanes (both directions) moved from mixed-traffic sharrows to sidewalk-level lanes adjacent to sidewalk, separated from street by tree/streetlight parkway buffer.	• Total loss of street parking risks harming businesses – could require mitigation via city purchase of land for 1-2 shared surface lots (structured parking cost likely prohibitive) • Improved safety of bike lane should improve life quality/placemaking
South of Bridge 2-lanes with BRT (Concept 4)	46 of 46 removed	• 2 lanes removed • Addition of center dedicated lane for BRT (2-lane width at platform area between 4th & 5th)	• Bike lanes (both directions) moved from mixed-traffic sharrows to sidewalk-level lanes adjacent to sidewalk, separated from street by tree/streetlight parkway buffer.	• Total loss of street parking risks harming businesses • Addition of transit should have generally positive effect on property values and may lower parking dependence over time. • Improved safety of bike lane should improve life quality/placemaking

Overall Evaluation of Concept Alternatives.

From a fairly narrow, short-term economic standpoint the most desirable options are the ones that:

- avoid significant loss of street parking,
- compensate for potential reduction in traffic throughput by adding a turn lane or turn pockets, and
- take steps to improve the bicycle and pedestrian environments through lane dedication and protection – preserving the continuity of high-quality bike/ped experience on either side of the Study Area

Based on these criteria, the 4-lane concept is problematic for the North of Bridge segment. Although reduces parking by half rather than altogether, it cannot be eliminated solely on the basis of parking or its lack of a turn lane. Overall, however, it does not seem to offer any clear advantage in terms of bike/ped experience and safety over the 3-lane North of Bridge Concept.

Thus, **the 3-lane alternative for the North of Bridge appears to be a clear winner for that segment** (cost considerations notwithstanding).

For the South of Bridge segment, Concept 3 (4-lane) and Concept 4 (2-lane plus dedicated center-running BRT service) center, are difficult to recommend.

Concept 3 is perhaps least desirable since it eliminates all 46 parking spaces in that segment without compensating with addition of transit or offering bike/ped improvements beyond what can be found in Concepts 1A, 1B, or 2A (all with raised, separated bike lanes).

Concept 4 compensates somewhat for its elimination of all parking by adding BRT, which is likely to increase property values over time, have a potential catalyzing effect for redevelopment, and may lower the demand for parking over time by encouraging transit use over auto travel on Higgins. While those are all desirable long-term benefits, the three-block total parking loss seems like an unacceptable risk to businesses in the short term for Concept 4.

Of the remaining concepts south of the bridge, 2A, although it results in a net gain of two parking spaces and adds a center turn lane in compensation for removing two drive lanes, seems at least somewhat inferior to 2B in that it results in bike lanes that must navigate along the edge of drive-lane traffic while adjacent to the door-opening zone of the parking lane, without benefit of a raised pathway on the same level as shops.

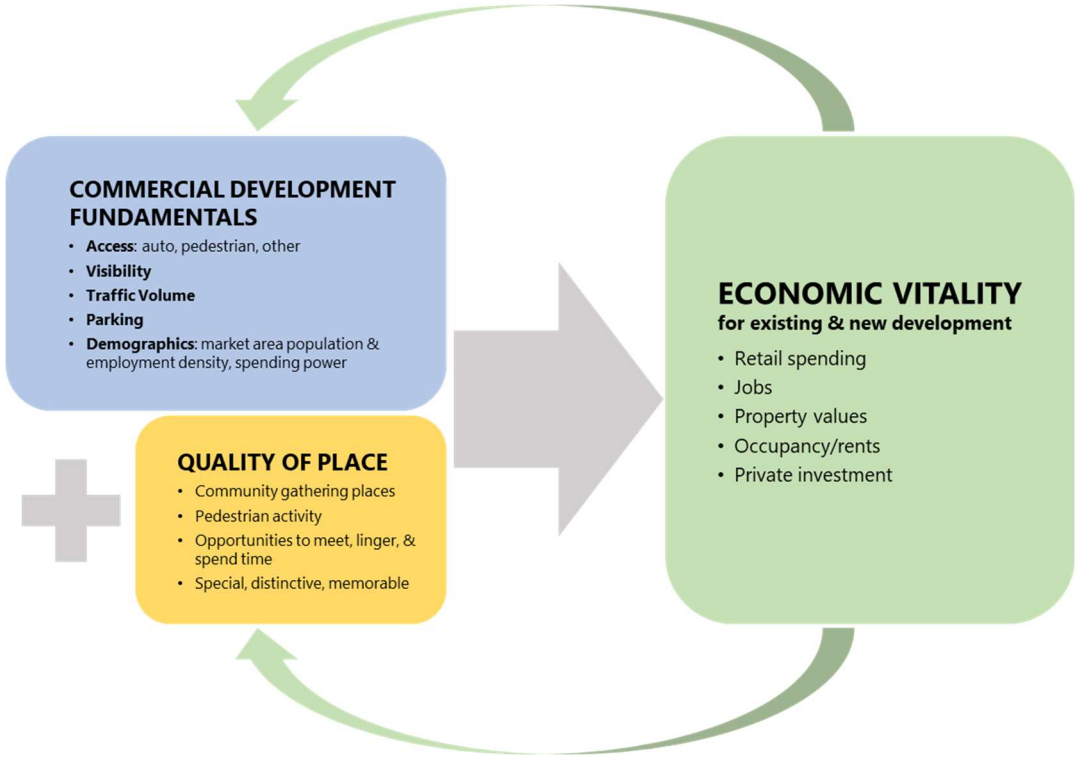
South of Bridge Concepts 1A (2-lane with possible roundabouts), 1B (2-lane with pocket turns), and 2B (3-lane including turn lane with raised bike lane) appear to be effectively tied in terms of likely economic impacts. Those options are unlikely to harm street-adjacent businesses and may have a positive impact by improving alternate travel mode safety, activity, and atmosphere. Decisions should be based more on cost and specific transportation considerations.

ROLE OF MULTI-MODAL IMPROVEMENTS IN ECONOMIC VITALITY

The foregoing discussions, both of the academic literature on economic impacts and of the potential differences across detailed alternative concepts, are important to step through and may be valuable from a thoroughness standpoint, but they may have the unfortunate side-effect of drawing too tight a focus on individual project components in isolation (parking loss, drive lane changes, etc.). In doing so, it's easy to lose sight of the bigger picture of how complete streets-style multi-modal improvements can improve economic vitality.

As shown in the figure below, real economic vitality comes about when the core fundamental locational attributes of commercial development—access, visibility, traffic volume, parking, and favorable demographics – come together with the critical but less tangible factors that make for superior quality of place. These include favorite community gathering places, robust walkability, opportunities and rewards for lingering, and distinctive, memorable imagery and experiences. When the two combine effectively, places become simply more desirable destinations than alternative locations. This advantage drives retail spending, creates jobs, and lifts property values – keeping buildings full, supporting healthy rents, and spurring continual private investment.

Figure 12: Development Fundamentals, Quality of Place, and Economic Vitality



As a bonus, the resulting economic vitality is able to feed back into both improved development fundamentals and better, more distinctive and more desirable places, continuing a virtuous cycle.

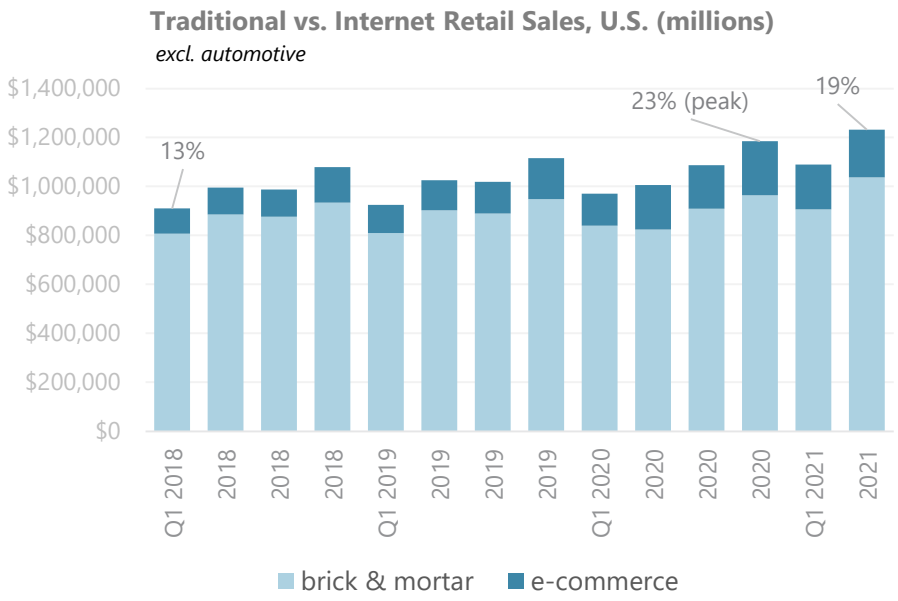
So, although the multi-modal improvements to Higgins will involve many detailed considerations and decisions about preserving or maximizing certain commercial development fundamentals, the driving force behind those street changes is a big idea, with many moving pieces on many fronts, about how to continually build on downtown Missoula's strengths – to preserve and improve it as a special place with qualities that make people want to be there. That ongoing effort is what helps to set the town apart from others with just a similar scenery or similar population.

Experiential Retail

This virtuous cycle effect and its reliance on quality of place resonates with a growing realization and strategic trend in retail, as that sector fights to cope with competition from internet selling.

Over the past decade the retail sector of the nation's (and Missoula's) economy has seen the rise of internet-based selling from a relative novelty to a very genuine and substantial competitive threat to brick-and-mortar retailers. Just since 2018, e-commerce has grown from a 13-percent share of non-automotive retail sales to approximately 20 percent (surpassing 20 percent during the height of the Covid pandemic. Reaction from the traditional retail community has gone from hoping that internet sales will plateau after an initial novelty effect to general acceptance that on-line competition is here to stay.

Figure 13: E-Commerce Share of U.S. Retail Sales, 2018 to Q2-2021



Source: U.S. Census Bureau and Leland Consulting Group

Some retailers have responded with an "if you can't beat them, join them" strategy with stores attempting to combine on-line orders with in-store pickup. This remains a relatively common approach, with some product categories being more well suited than others to joining in. Many retailers saw a surge of fulfillment-only business during Covid that is likely to be somewhat temporary. During the height of Covid lockdowns (and continuing into the lingering cautionary period of resurging variant outbreaks) restaurants were especially active in the take-out business.

The more long-term strategy, however, is to assume that retail categories with strong experiential aspects (touching, tasting, sharing, interacting) will have a lingering advantage over, and resistance to, internet-only competition. Those store types without strong experiential components to their shopping/consuming routine have been encouraged to quickly learn how to add those more sensual and social pieces to better survive as brick-and-mortar alternatives to web shopping.

Most dining and drinking establishments (with the exception of delivery-only pizza and similar outlets) are naturally experiential and already enjoy those advantages to at least some extent. With a retail mix that is heavy on restaurants and bars, the Study Area portion of Higgins is naturally insulated against the worst-case scenario of giving way entirely to Amazon-like competition.

The argument is rooted more in common sense than empirical evidence, but it is likely that establishments combining indoor and outdoor seating, particularly in proximity to interesting urban sights and sounds, can deliver an elevated experiential value over indoor-only dining punctuated with before-and-after suburban surface parking. Although the vast majority of downtown diners will arrive by car, even downtown, it makes sense that proximity to fast-moving auto traffic detracts, rather than adds to, the experience of dining.

Taken in combination, it makes sense that improvements to active travel modes – especially slower-moving ones that give people time to really experience their surroundings, are part of the key to protecting the competitive advantage of a real live downtown over a series of mouse clicks.

THREE BRIEF BEST-PRACTICE CASES

Finally, in recognition that the whole of downtowns, and the multi-modal environments that help people experience them, can be bigger and better than the sum of their measurable parts, we close with two brief case studies of mid-sized cities that have leveraged bicycle and pedestrian improvements to improve the quality of their downtown experience. The examples are not found in our summary of academic attempts at measuring impacts, but the process and visible results help to illustrate how such changes can work in tandem with other improvement efforts to make more vital places.

Aside from the general inspiration of seeing successfully executed multi-modal improvements, the main takeaways from these cases are that such projects tend to:

- Be part of larger, multi-stage plans to elevate quality of life, sense of place, and economic vitality over many years
- Involve numerous public private partnerships and a general cooperative community spirit
- Showcase attention to detail – beyond the nuts-and-bolts engineering components of lane widths and turn locations – including innovative design, materials, and artistic inputs.
- Adhere to a continuous planning vision but be flexible enough to change iteratively as the plan context evolves

West Lancaster Boulevard, Lancaster, CA

Lancaster, California, is an exurb of Los Angeles so removed from the urbanized fabric of that metropolis that is seems and functions like its own small-town place. In a project that began in the throes of the 2007-08 real estate bubble, Lancaster chose to remake Lancaster Boulevard from an uninspiring auto-oriented arterial strip through its downtown into a vibrant pedestrian-friendly center that has become a regional draw.

Between 2007 and 2012, despite (and according to some, because of) significantly reducing the street real estate devoted to automobile travel lanes and on-street parking, the surrounding downtown doubled its sales tax revenues, saw 48 new businesses, and added over 800 new permanent jobs. Across the wider downtown, Lancaster has added over 800 new housing units. Since the street makeover, Lancaster Boulevard has added an art theater, microbrewery, Urban Outfitters, and art museum while reinvigorating its existing performing arts center.

The original five-lane right of way (including a center turn lane) was reduced to two lanes. The center of thoroughfare was transformed into a tree-shaded public *ramblas* (Spanish-style tree-lined boulevard) over the two busiest blocks, with extensive streetscaping and pockets of off-street angled parking replacing ubiquitous on-street parking. The street is now very amenable to festivals and is routinely closed off to traffic to accommodate them. A 2012 Halloween festival drawing 30,000 visitors to the town of 160,000 is considered a typical event crowd. The City has full-time staff dedicated to programming the Boulevard for events.

Figure 15: Lancaster Boulevard Before

Figure 14: Lancaster Boulevard, After (Closed to Traffic for Festival)

Figure 16: Typical Mid-Block Crossing

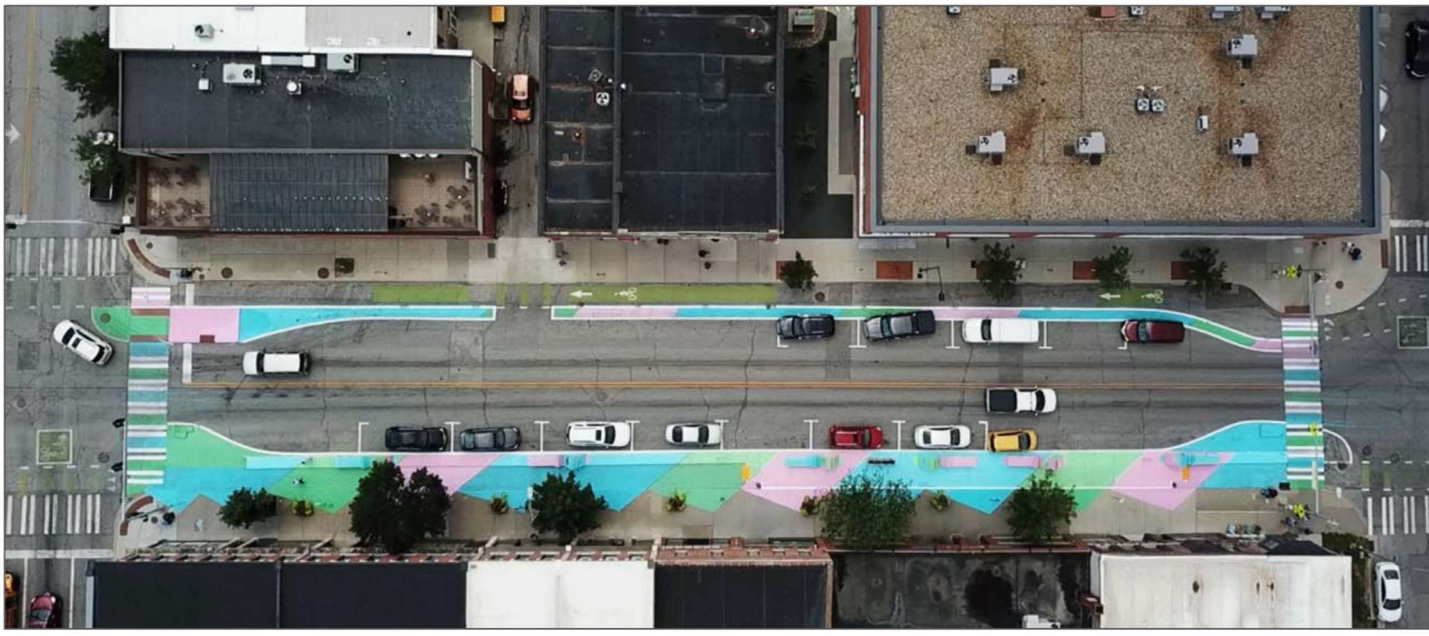
Figure 17: Oversized Ramblas Area with Innovative Lighting

East Grand Avenue, Des Moines, IA

The East Grand Avenue Pilot Project was part of Connect Downtown, an initiative led by the City of Des Moines, Urban Land Institute Iowa, and the Greater Des Moines Partnership a lane reconfiguration to include two travel lanes, on-street parking, and protected bike lanes. The changes were designed to slow down traffic without significantly reducing commute times, create parking and make the area more walkable and easier to navigate – all in an effort to improve access to and within Downtown where people walk, ride their bicycle, drive and use transit, building on the momentum and vibrancy of other changes taking place in a reinvigorated Downtown Des Moines.

The reconfiguration, begun in the Fall of 2017, was spurred by community feedback on dangerous intersections for pedestrians, created the first protected bicycle lane in Des Moines and included artistic intersection markings planned and executed with extensive community input.

Figure 18: Colorful Lane Markings Added in 2018



Source: Team Better Block

The project involved placement of transit stops in the travel lane to minimize delay to transit buses and was able to improve sight lines for pedestrians and bicyclists by relocating parking to adjacent corridors. In spring 2018, minor changes to the placement of plastic delineators were made, including reduced distance from the curb and removal of delineators near intersections to accommodate larger vehicles turning radius requirements.

.In the summer of 2018, AARP Iowa and AARP Livable Communities teamed with Team Better Block to build and improve on the innovative bike pilot demonstration on East Grand Avenue already underway. By summer 2018, project led to new partnerships (AARP, local business owners and Greater Des Moines Partnership). Partnerships and grant awards funded additions to the bicycle lane including larger delineators, very colorful paint design, street furniture, potted plants. Other interventions in the so-called East Grand Better Block

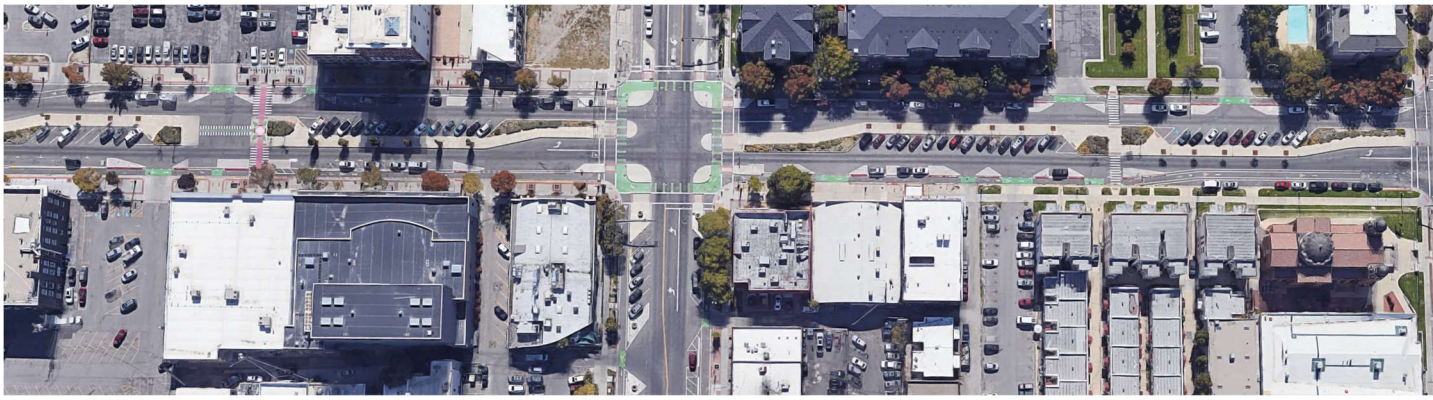
included bulbouts, patio seating, a wall mural, colored crosswalks, a bike lane delineated with trees and planters, and a transit stop.

Source: Team Better Block

In the end, project support was driven by local business-owners after education on the potential revenue increase effects of bicycle infrastructure. Application of latest standards in bikeway design have been largely seen as successful, with only minor changes needed to accommodate larger sized vehicles as necessary. The first experience for Des Moines of a protected bikeway street re-design inspired new partnerships to form. Those organized groups won grant funding and successfully re-invigorated the pilot project into a safe and interactive work-of-art.

https://teambetterblock.com/east-grand

300 South (Broadway), Salt Lake City, Utah



In 2014, Salt Lake City began Installation of a protected bicycle lane and re-designed streetscape on 300 South (Broadway) in support of providing accessibility for residents of all ages, and improving the City's livability, sustainability, air quality, economy, and public health. The City followed-up by performing an impact study on economic development, among other variables, in relation to the completed project.

Design features included:

- re-designed streetscape
- street planters
- public art
- improved pedestrian crossings
- colored pavements
- switched some diagonal parking to parallel parking
- concrete buffers between traffic lanes and the cycle track.

Over a year after the completed cycle track construction, the Salt Lake City Division of Transportation released an in-house study that measured the cycle track's effects on utility, safety, public sentiment, and economic development. Using data from businesses along the corridor collected from Utah State Tax Commission that study found that Sales Tax Gross Receipts increased by 8.79%, when comparing the first six months of the year between 2013 (pre-project) and 2015 (post-project)

A more qualitative survey of retail, restaurant, and service businesses found…

- 79% of owners reported business was good.
- 16% reported business was better than before
- 4% reported business was down

REFERENCES: ECONOMIC IMPACTS OF MULTI-MODAL IMPROVEMENTS

Boarnet, M. G., Joh, K., Siembab, W., Fulton, W., & Nguyen, M. T. (2011). Retrofitting the suburbs to increase walking: Evidence from a land-use-travel study. *Urban Studies*, *48*(1), 129–159. doi:https://doi.org/10.1177/0042098010364859 [Crossref], [PubMed], [Web of Science ®], [Google Scholar]

Bopp, M., Sims, D., & Piatkowski, D. P. (2018). *Bicycling for transportation: An evidence-base for communities*. Cambridge, MA: Elsevier. [Google Scholar]

Chan, M., Gapski, G., Hurley, K., Ibarra, E., Pin, L., Shupac, A., & Szabo, E. (2016). *Bike lanes, on-street parking, and business in Parkdale: A study of Queen Street West in Toronto's Parkdale neighborhood*. Toronto. [Crossref], [Google Scholar]

City of Calgary. (2016). *Centre city cycle track pilot: Summary report*. Calgary. [Crossref], [Google Scholar]

Clifton, K. J., Muhs, C., Morrissey, S., Morrissey, T., Currans, K., & Ritter, C. (2013). *Examining consumer behavior and travel choices*. [Crossref], [Google Scholar]

Drennen, E. (2003). *Economic effects of traffic calming on urban small businesses*. San Francisco, CA: San Francisco State University. [Google Scholar]

Fitch, D., Thigpen, C., Cruz, A., & Handy, S. L. (2016). *Bicyclist behavior in San Francisco: A before-and-after study of the impact of infrastructure investments*. Retrieved from http://ncst.ucdavis.edu/project/ucd-ct-to-012%5Cnhttps://trid.trb.org/view/1344603 [Crossref], [Google Scholar]

Flusche, D. (2012). *Bicycling means business: The economic benefits of bicycle infrastructure*. [Google Scholar]

Krizek, K. J. (2007). Estimating the economic benefits of bicycling and bicycle facilities: An interpretive review and proposed methods. In P. Coto-Millán & V. Inglada (Eds.), *Essays on transport economics* (pp. 219–248). New York: Physica-Verlag. [Crossref], [Google Scholar]

Liu, J. H., & Shi, W. (2020a). *Economic impacts of bicycle and pedestrian street improvements*. [Google Scholar]

Liu, J. H., & Shi, W. (2020b). *Understanding economic and business impacts of street improvements for bicycle and pedestrian mobility – A multi-city multi-approach exploration*. Retrieved from http://nitc.trec.pdx.edu/research/project/1161%0Ahttps://trid.trb.org/view/1475349 [Crossref], [Google Scholar]

McCormick, B. C. (2012). *York Blvd: The economics of a road diet*. [Google Scholar]

McCoy, R., Poirier, J. A., & Chapple, K. (2019). Bikes or bust? Analyzing the impact of bicycle infrastructure on business performance in San Francisco. *Transportation Research Record*, *2673*(12), 277–289. doi:https://doi.org/10.1177/0361198119850465 [Crossref], [Web of Science ®], [Google Scholar]

Monsere, C., Dill, J., Mcneil, N., Clifton, K. J., Gilpin, J., Voros, K., … Parks, J. (2014). *Lessons from the Green Lanes : Evaluating protected bike lanes in the U.S*. [Google Scholar]

New York City Department of Transportation. (2012). *Measuring the Street: New metrics for 21st century streets*. New York. [Google Scholar]

New York City Department of Transportation. (2013). *The economic benefits of sustainable streets*. New York. Retrieved from http://www.ssti.us/wp/wp-content/uploads/2014/01/dot-economic-benefits-of-sustainable-streets.pdf%0Ahttp://www.nyc.gov/html/dot/downloads/pdf/dot-economic-benefits-of-sustainable-streets.pdf [Google Scholar]

Pivo, G., & Fisher, J. D. (2011). The walkability premium in commercial real estate investments. *Real Estate Economics*, *39*(2), 185–219. doi:https://doi.org/10.1111/j.1540-6229.2010.00296.x [Crossref], [Web of Science ®], [Google Scholar]

Poirier, J. A. (2018). Bicycle lanes and business success: A San Francisco examination. *Transportation Research Record*, *2672*(7), 47–57. doi:https://doi.org/10.1177/0361198118792321 [Crossref], [Web of Science ®], [Google Scholar]

Popovich, N., & Handy, S. L. (2014). Bicyclists as consumers mode choice and spending behavior in Downtown Davis, California. *Transportation Research Record*, *2468*(2468), 47–54. doi:https://doi.org/10.3141/2468-06 [Crossref], [Google Scholar]

Rijo, S. A. (2015). *Economic and traffic impacts following the installation of new bicycle facilities: A Denver case study*. University of Denver. Retrieved from http://search.proquest.com.ezaccess.library.uitm.edu.my/docview/1767790870?accountid=42518 [Google Scholar]

Rowe, K. (2013). *Bikenomics: Measuring the economic impact of bicycle facilities on neighborhood business districts*. University of Washington. Retrieved from http://cep.be.washington.edu/wp-content/uploads/2013/07/bikenomics_v2.pdf [Google Scholar]

San Francisco City Transportation Authority. (2010). *Columbus avenue neighborhood transportation study*. San Francisco. [Google Scholar]

Stantec. (2011). *Vancouver separated bike lane business impact study*. Retrieved from http://vancouver.ca/ctyclerk/cclerk/20110728/documents/penv3-BusinessImpactStudyReportDowntownSeparatedBicycleLanes-StantecReport.pdf%5Cnpapers2://publication/uuid/45AD8351-C85E-4BF9-9613-DAA5A4B53760 [Google Scholar]

Straatsma, R., & Berkhout, T. (2014). *Bikes mean business: Building a great cycling (and walking) city*. [Google Scholar]

Sztabinski, F. (2009). *Bike lanes, on-street parking and business: A study of Bloor Street in Toronto's annex neighborhood*. [Google Scholar]

Tehnopolis Group. (2016, March). Evaluating the economic and social impacts of cycling infrastructure: Considerations for an evaluation framework (pp. 1–94). Retrieved from www.technopolis-group.com [Crossref], [Google Scholar]