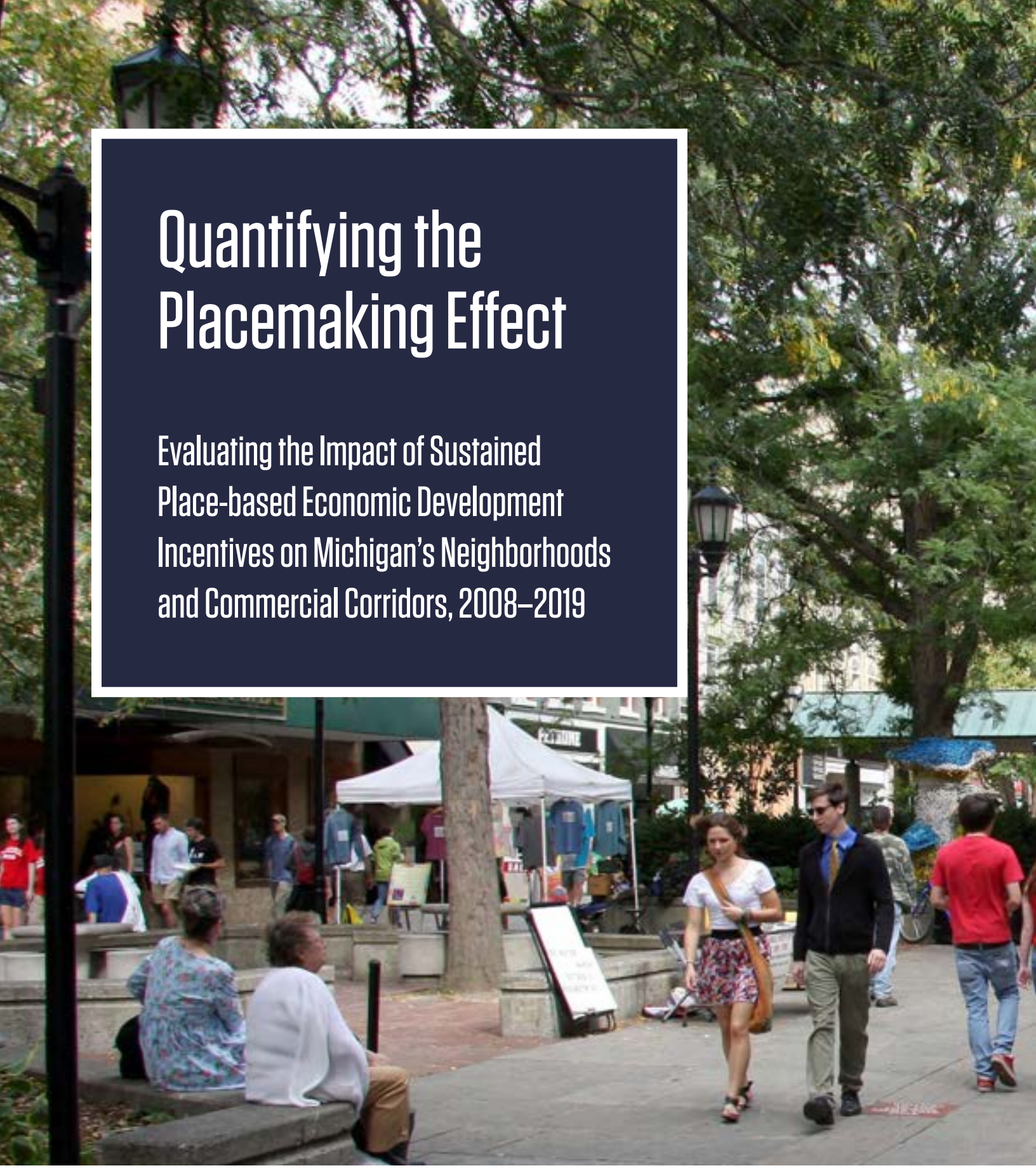


Quantifying the Placemaking Effect

Evaluating the Impact of Sustained Place-based Economic Development Incentives on Michigan's Neighborhoods and Commercial Corridors, 2008–2019

MICHIGAN ECONOMIC DEVELOPMENT CORPORATION

dynamometrics

Executive Summary

The Michigan Economic Development Corporation's (MEDC) focus on direct community investment is unique among its state-level peers. An overarching strategy of MEDC Community Development Incentives (CDI) Programs is to identify and actualize place-based investment opportunities that may otherwise lie dormant without public support. The goals of place-based economic development programming include the betterment of neighborhoods and commercial corridors to attract occupancy and investment. MEDC asked Dynamo Metrics ("Dynamo") to quantify the impacts of these investments* on nearby neighborhoods and commercial corridors. The resulting study provides a first-of-its-kind evaluation that looks at "people focused" community development investment and formally quantifies the positive placemaking effects.

The MEDC CDI Programs evaluated in this study include the Michigan Community Revitalization Program, the Brownfield Tax Increment Financing Program, the non-entitlement Community Development Block Grant Program, and the Public Spaces Community Places Program. MEDC provided Dynamo with detailed information on how funds from those four incentive programs were used. Dynamo was then able to obtain comprehensive time-series, property-level data covering the 2011–2017 time period to perform analysis on the impact of these investments in six representative communities—Detroit, Grand Rapids, Lansing, Marquette, Alpena, and Adrian (collectively, the "six cities")—as well as general statewide socioeconomic data that allows for applied impact analysis outside the six cities.

Residential property value impact findings were consistent in the six cities and statewide. Data constraints on commercial property values prevented Dynamo from assigning an estimate of statewide commercial property value impact. Though this study focuses primarily on the six cities, the findings of this analysis can be applied to provide useful insights statewide.

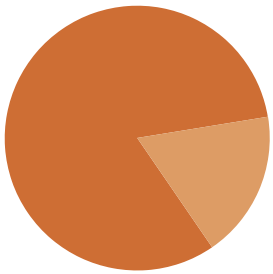
Findings are built into a statewide data system and software, Neighborhood Intel™, which empowers MEDC to evaluate the impact of future investments to target and measure its placemaking work. This groundbreaking capability to predict outcomes before investment further establishes MEDC as a place-based economic development leader.

** Throughout this report, we use the term "MEDC investment" to refer to both general and programmatic funds administered by MEDC. All recommendations for use of programmatic funds are presented to the Michigan Strategic Fund (MSF) Board for consideration and approval. The MSF Board of Directors has granted authority to the MEDC to provide administrative services to the MSF for these programs.*

SIX CITY FINDINGS: Detroit, Grand Rapids, Lansing, Marquette, Alpena, Adrian

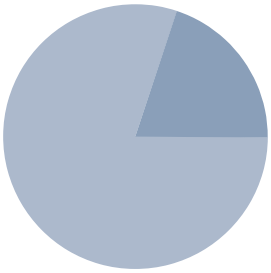
176 Deals *from 2008 - 2019*

$ 3.9 billion Total Property Value Impact



- **$ 3.2 billion** Total Commercial Propery Value Increase
- **$ 659 million** Total Residential Property Value Increase

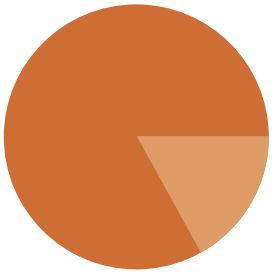
$ 3.2 billion Total Investment



- **$ 625 million** in MEDC Investment
- **$ 2.6 billion** in Private Investment

$1 of MEDC Investment Creates*

$ 6.18 Increase in Nearby Property Value



- **$ 5.13** Increase in Commercial Property Value
- **$ 1.05** Increase in Residential Property Value

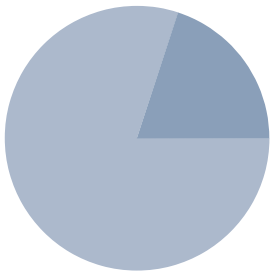
3.22 % Increase in Nearby Commercial Occupancy

2.90 % Increase in Nearby Residential Occupancy

STATEWIDE FINDINGS

542 Deals *from 2008 - 2019*

$ 5.4 billion Total Investment



- **$ 1.1 billion** in MEDC Investment
- **$ 4.3 billion** in Private Investment

$1.00 MEDC Investment = **$3.88** Private Investment

* MEDC investment impact assumes private investment and CDI deals would not have occurred without MEDC.

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Dynamo Metrics | Data. Analytics. Policy. We quantify and predict the social and economic impacts of alternative policy and investment choices.

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Introduction

The Michigan Economic Development Corporation (MEDC) asked Dynamo Metrics ("Dynamo") to quantify the impacts of its community investments on nearby neighborhoods and commercial corridors made under four place-based economic development incentive programs: the Michigan Community Revitalization Program, the Brownfield Tax Increment Financing Program, the non-entitlement Community Development Block Grant program, and the Public Spaces Community Places Program. An overarching strategy of these MEDC Community Development Incentives (CDI) programs is to identify and actualize investment opportunities that will have a catalytic impact on placemaking and the general success of Michigan's downtowns and commercial corridors. The goals of place-based economic development programming include the betterment of neighborhoods and commercial corridors to attract occupancy and investment. The findings of this study show that MEDC achieved these goals during its first decade of placemaking investment.

Throughout this report, we use the term "MEDC investment" to refer to both general and programmatic funds administered by MEDC. All recommendations for use of programmatic funds are presented to the Michigan Strategic Fund (MSF) Board for consideration and approval. The MSF Board of Directors has granted authority to the MEDC to provide administrative services to the MSF for these programs.

MEDC provided Dynamo with detailed information on how funds from those four incentive programs were used in the completion of 542 real estate development or redevelopment deals[1] completed between 2008 and 2019. Dynamo was then able to obtain comprehensive time-series, property-level data covering the 2011–2017 time period ("empirical analysis period") to perform analysis on the impact of these investments in six representative communities—Detroit, Grand Rapids, Lansing, Marquette, Alpena, and Adrian (collectively, the "six cities")—as well as general statewide socioeconomic data that allows for applied impact analysis outside the six cities.[2]

The goals of place-based economic development programming include the betterment of neighborhoods and commercial corridors to attract occupancy and investment. The findings of this study show that MEDC achieved these goals during its first decade of placemaking investment.

SIX-CITIES FINDINGS

MEDC invested $625,010,924 across the 176 deals in the six cities and leveraged $2,617,750,023 in private investment for a total investment of $3,242,808,392 during the 2008–2019 study period. Dynamo applied findings from the empirical analysis period to all six-city deals, finding that:

1. MEDC CDI deals increased occupancy rates in all residential and commercial buildings within 1,000 feet of MEDC investment sites by approximately 3%.

2. Every $1.00 invested by MEDC in the six cities created $5.13 in nearby commercial property value and $1.05 in nearby residential property value for a total of $6.18 in nearby property value.

3. Every $1.00 invested in CDI Deals (MEDC + Private investment) in the six cities created $0.99 in nearby commercial property value and $0.20 in nearby residential property value for a total of $1.19 in nearby property value.

4. MEDC CDI deals increased residential and commercial property values by $3,864,786,405 within 2,000 feet of MEDC investment sites one year or greater after the commencement of the deals. Results by city are as follows:

- *Detroit, by $2,720,084,740 from 82 deals*
- *Grand Rapids, by $735,648,695 from 60 deals*
- *Lansing, by $297,601,422 from 13 deals*
- *Marquette, by $84,064,262 from 8 deals*
- *Adrian, by $13,967,169 from 6 deals*
- *Alpena, by $13,420,119 from 7 deals*

STATEWIDE FINDINGS

MEDC invested $1,095,834,599 across the 542 statewide deals and leveraged $4,256,362,197 in private investment for a total investment of $5,352,978,549 during the 2008–2019 study period.

Dynamo also applied findings from the empirical analysis period to all statewide deals, finding that:

1. The 542 MEDC CDI deals raised nearby residential property values by an estimated $1,182,816,385.

2. Every $1.00 of MEDC investment leverages $3.88 in private investment.

Data constraints on commercial property values prevented Dynamo from assigning an estimate of statewide commercial property value impact. However, the empirical analysis allows us to learn about the relationship between commercial and residential property value impacts. Residential property value impact findings were consistent in the six cities and statewide. The overall commercial property value impact findings from the six-city empirical analysis show that approximately 83% of property value impacts are attributed to nearby commercial properties, while 17% of property value impacts are attributed to nearby residential properties. While we cannot state with scientific authority that this relationship will hold, it provides a sense of expected commercial property value impacts outside the six cities.

NEW METHODS FOR MEASURING ECONOMIC DEVELOPMENT IMPACT

Dynamo used two econometric methods to estimate MEDC CDI investment impact results of this study: (1) the difference-in-differences (DID) method[a] to quantify and test the impact of MEDC CDI investment on nearby residential and commercial occupancy rates; and, (2) the hedonic property valuation method[b] (hedonic method) to quantify and test the impact of MEDC CDI investment on nearby residential and commercial property values. Both methods are designed to measure how properties nearby MEDC investments differ before and after investment.

The most proven and best tool for measuring property value impacts of nearby amenities and disamenities is hedonic pricing method. Given MEDC's goal to understand the impact of its CDI investments on the surrounding environment, the hedonic method is the perfect fit. To achieve this goal, Dynamo built custom hedonic pricing function variables—investment amount, distance from investment, and date of sale—to quantify these effects.

The difference-in-differences (DID) method was chosen to measure the impact of occupancy rate as a result of MEDC investment because it is an ideal way to measure the differences between areas with and without MEDC investment.

The hedonic and DID methods complement other impact measurement approaches such as Regional Economic Models, Inc. Public Investment modeling (REMI PI+)[c] and informal qualitative measurements[d] by measuring what they cannot: the commercial and residential property value and occupancy impacts of MEDC CDI placemaking investments on nearby property values and occupancy rates.

Our methods have an added benefit: they create predictive residential and commercial property value and occupancy rate impact metrics. Impact varies from place to place depending on a variety of factors. With the findings of the hedonic model, MEDC can now predict the varying property value changes resulting from CDI deals to target areas where investment will have the greatest impact.

PROPERTY VALUE IMPACT MULTIPLIERS, BENEFIT-COST RATIOS, AND MEDC INVESTMENT IMPACT

This study produced two key statistics: property value impact multipliers (PVIMs) and benefit-cost ratios (BCRs). Both are used to measure property value impact, but they consider impact differently and have different applied uses. PVIMs measure the impact of an investment on any individual property value within 2,000 feet. BCRs measure the property value benefit per dollar invested on all properties with 2,000 feet of an investment.

To find the BCR of a given investment, the total impact of the investment must be quantified and then divided by the total investment amount. To quantify total impact of an investment, PVIMs must be applied to all properties within 2,000 feet of an investment and aggregated. Thus, the BCR cannot be calculated without applied PVIMs.[3]

PVIMs vary based on project submarket, size of investment, property value, and distance from a given project. Since BCRs are reliant on aggregating the total property value impact within 2,000 feet of an investment (applied PVIMs), they vary based on property density.

Introduction

This report contains two BCRs: (1) total investment BCRs, which measure the property value impact of an investment in relation to the total investment amount (MEDC + private), and (2) MEDC investment BCRs, which measure the property value impact in relation to only the MEDC investment amount. MEDC investment BCRs assume that MEDC investment is responsible for all impacts. While this assumption of attributed impact may be strong, it is critical to point out that MEDC CDI Programs evaluated in this study are fundamentally designed to be catalytic, such that each deal would have been less likely to occur without MEDC investment. It is also important to note that the methods employed in this study only quantify impact in relation to the total investment made.

The overall impact in the six cities is $3,864,786,405. The aggregated six-city total investment BCR is 1.19, meaning every dollar of the $3,242,808,392 total investment spent created $1.19 in commercial and residential property value.

The aggregated six-city MEDC investment BCR is 6.18, suggesting that every dollar of the $625,010,924 MEDC investment spent in the 176 six-city deals created $6.18 in commercial and residential property value.

An additional and critically important factor to take into consideration with the quantified PVIMs and BCRs are the direct economic impacts and benefits that our methods do not quantify. Investments that have direct economic benefits are considered the "cost" in our study while in reality they also have clear and numerous benefits of their own, such as multiplier effects on relevant industries and jobs and fiscal impacts such as new taxation as a result of the investment itself.[e] Our approach does not quantify or consider these benefits, but rather quantifies the impact on the area surrounding the investment sites.

STUDY IMPLICATIONS AND RECOMMENDATIONS

The primary implications of the findings from this study indicate that statistically significant and measurable placemaking effects result from sustained place-based investments over time. These are reflected by increased property values and occupancy rates near MEDC investment sites. With these findings, MEDC can evaluate the performance of past and current activities and predict the impact of future choices on nearby neighborhoods and commercial corridors.

For MEDC and the State of Michigan to fully employ these metrics for program evaluation and future site selection, MEDC must begin building a knowledge base of all residential and commercial properties in the areas of Michigan where they consider making direct community investments. This requires time-series, property-level economic data and metrics that are automatically updated and transformed into easy-to-understand information that stakeholders can interpret, share, and act on.

Equitably increasing the wealth, prosperity, opportunity, and vibrancy of Michigan's communities—the goals of MEDC's placemaking investments—can be achieved through strategic knowledge growth, increased capacity of data and technology infrastructure, and application of these systems and metrics across Michigan's communities. Dynamo recommends that MEDC expedite the process of acquiring this market intelligence capability to inform site selection and placemaking investments with predictive metrics that maximize the impact of its economic development objectives.

The COVID-19 recession has created extreme pressure on state and local governments. With the passing of the $900 billion COVID-19 Relief Bill (which included robust business support through the extension of SBA Paycheck Protection Program), the recent passing of the $1.9 trillion American Rescue Plan, and broad near-term distribution of effective COVID-19 vaccines, resources for businesses and families are within reach for a swift and strong economic recovery. Thus, MEDC's work to create places that support community vibrancy and interconnectivity between businesses and residents is now more important than ever before.

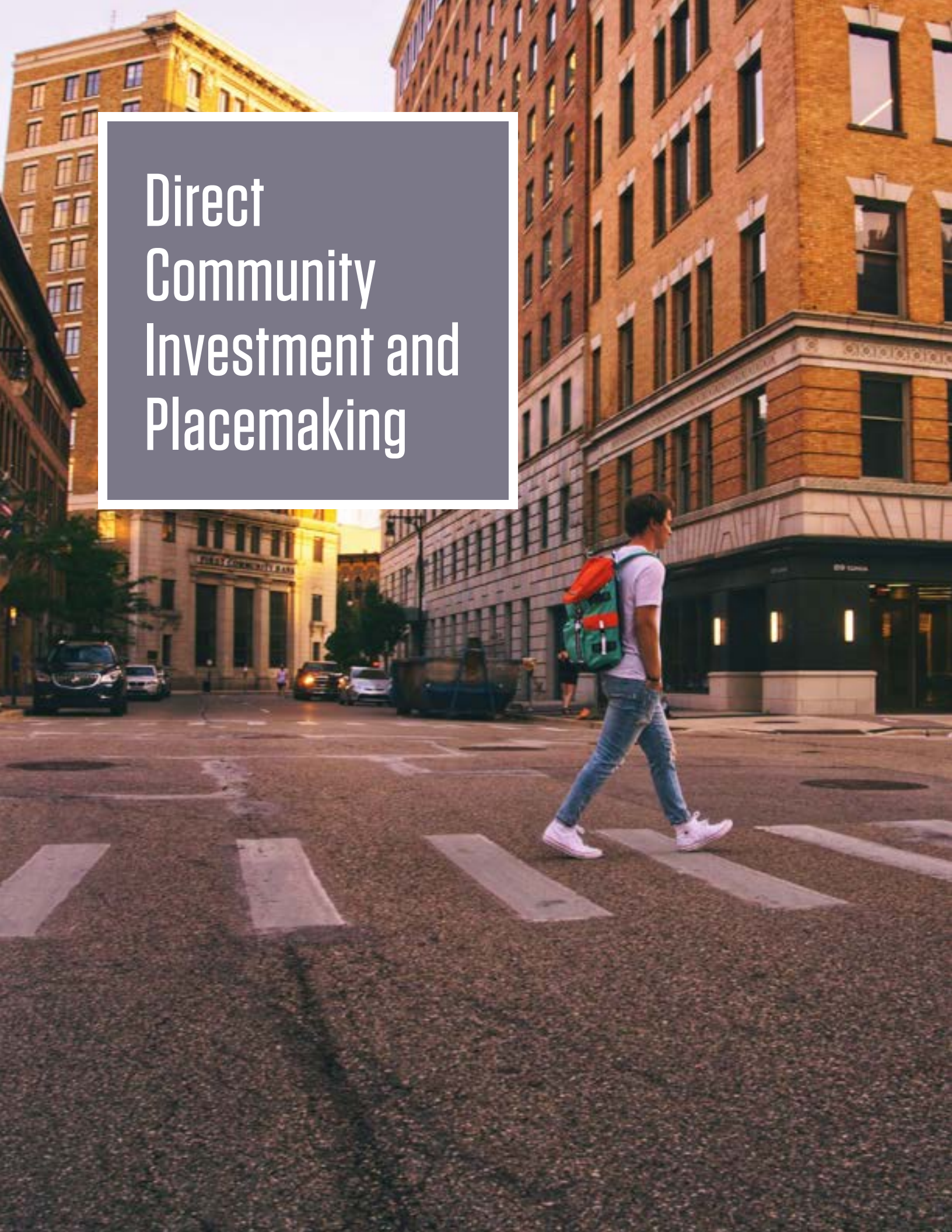
The State of Michigan and its partners have been dedicated to place-based economic development strategies since 2012. We believe that this novel commitment to strengthening the lifeblood of Michigan's urban cores gives our state a unique competitive advantage to attract and retain talent as high-value knowledge workers move to the places they want to be.

Introduction

Compared to the coasts and sunbelt, Michigan's cost of living is affordable, our natural resources are unsurpassed, and the competitiveness of our knowledge-based industries are on the rise.

Additionally, the COVID-19 pandemic and associated lockdowns have made clear that the hyper-concentration of the tech economy in a few coastal megacities is rapidly changing. For these reasons, Dynamo Metrics strongly recommends that MEDC continue investing in place-based economic development. It is shown in this study that in pre-pandemic times, these investments work and are catalytic in their impact on the vibrancy and economic health of our cities. While current investment in downtowns may be slower due to short-term decreased demand, it is more important than ever that our publicly financed economic development institutions lean into their support of the historical investments they've made to retain the confidence of their partners, residents, and future residents by showing sustained long-term commitment to Michigan's cities.

In addition to this report, Dynamo Metrics has delivered a data system and technology infrastructure designed to sustain and maximize the impact of MEDC's work. This empowers MEDC to identify places where the "invisible hand"[f] causes the market to function with little or no public investment and instead focus its efforts on building from areas of relative strength within historically disinvested places. With nine years of strategic community-based economic development and Dynamo Metrics' Neighborhood Intel software, MEDC is now in a unique position among its peers to more equitably build wealth and opportunity across the state.



Direct Community Investment and Placemaking

Direct Community Investment and Placemaking

Over the study period (2008–2019), MEDC programs invested approximately $1.1 billion in multi-year, place-based, direct Community Development Incentives. This investment garnered nearly $4.3 billion in private investment, for a total investment of approximately $5.4 billion. These funds were spent through four place-based programs that comprise the subject matter of this study: the Michigan Community Revitalization Program (MCRP), Brownfield Tax Increment Financing Program (Brownfield TIF), the non-entitlement-community Community Development Block Grant Program (CDBG), and Public Spaces Community Places Program (PSCP) (collectively, "CDI Programs").

Across the six cities, MEDC CDI Programs invested an average of $601 per resident, $545 per resident in large representative cities (Detroit, Grand Rapids, Lansing), and $1,660 per resident in small representative cities (Marquette, Adrian, Alpena). Though a larger proportion of total investment dollars occurred in the large cities, the greater per person investment is in the small cities.

The MEDC focus on direct community investments in placemaking is groundbreaking amongst their state-level peers; in 2017, for example, only three percent of economic development incentives nationally provided direct community financing, as the CDI Programs do.[4] Instead, state economic incentives nationally have remained centered on more traditional and passive approaches, such as direct tax incentives and business financing.[5]

MEDC CDI Programs stem from innovative research and strategic policy decisions made in 2012 that committed MEDC to the targeted revitalization of Michigan's urbanized corridors as a key element in competing and succeeding in the emergent knowledge-based economy.[g] This study provides a first-of-its-kind evaluation of the positive externality results of that decision, and in doing so, the first rigorous performance test of how effective direct community investments in placemaking are at improving community property values and occupancy rates.

Increasing property values suggest increasing demand for commercial and residential properties, just as increasing occupancy rates suggest increasing demand in a specific area thus driving up prices. Thus, Dynamo's impact metrics of changes in commercial and residential property values and occupancy rates are fundamentally indicative of placemaking performance over time. These metrics reflect the heart of microeconomic theory concerning supply and demand for scarce resources such as land, housing, and commercial space. They are also fundamental performance indicators of the fluctuations in demand for being located in Michigan's downtowns and commercial corridors as significant strategic investment has taken place in them.[h] When taken together, the directionality of these metrics over time indicates the health and vibrancy of a place. The primary methods in this study, hedonic property valuation and difference-in-differences modeling, provide a crucial complement to existing direct impact measurement methods[6], allowing MEDC to more fully evaluate and predict its impact on the Michigan communities it invests in as well as Michigan's economy overall.

"The MEDC was a fundamental partner in the transformation of Marquette's Downtown. Funding provided by the organization was a catalyst for restoration of properties in the district that otherwise were underutilized and/or blighted. The MEDC grants allowed Marquette's DDA to work with property owners to leverage private investment and make a meaningful impact on the district. The tangible value of MEDC's support can be seen in the increase of the district's taxable values which increased nearly twenty percent over the five year period from 2012 to 2017."

– Mona Lang, Marquette DDA, Executive Director 1998-2019

Direct Community Investment and Placemaking

PROGRAM DESCRIPTIONS[7]

Michigan Community Revitalization Program (MCRP)

Michigan Community Revitalization Program (MCRP) provides resources to empower private building developments and renovations in traditional downtowns and high-impact corridors. MCRP provides gap financing in the form of performance-based grants, loans, and other assistance to eligible private investment projects. MEDC administers MCRP for the Michigan Strategic Fund (MSF).[8]

Brownfield Tax Increment Financing Program (Brownfield TIF)

MSF's Brownfield Program, administered by the MEDC, uses TIF to reimburse brownfield-related costs incurred while redeveloping contaminated, functionally obsolete, blighted or historic properties. Under the Brownfield Program, the MEDC helps local municipalities improve historic districts, restore blighted areas, reactivate former industrial sites and jump-start investment in economically disadvantaged areas.

Community Development Block Grant Program (CDBG)

MEDC makes CDBG grants available to non-entitlement[9] Michigan communities for, among other uses, eligible building rehabilitation and facade improvements. MEDC administers CDBG funding provided by the U.S. Department of Housing and Urban Development (HUD) to MSF.

Public Spaces Community Places (PSCP)

In this first-of-its-kind program, MEDC matches community crowdfunding dollar-for-dollar, up to $50,000, for transformative placemaking investments.

NO EVALUATION BY PROGRAM

It is important to note that this study does not evaluate placemaking performance by specific CDI Program type. Instead, we evaluated the CDI Programs' aggregated total impact by measuring the combined MEDC and private sector investment in individual project deals. Some project deals contained funding from more than one CDI Program, while others did not. Some detailed program-by-program summary statistics on expenditures, such as the ratio of MEDC CDI investment and private sector investment ratios, are provided in Appendices 4 and 5.

"With these two developers making significant investments into their downtown buildings and working with MEDC every step of the way, we have another reason to be hopeful about the future . . . Their vision and creativity in finding these opportunities and being able to seize on them with MEDC's assistance will bring more residents to downtown, strengthen our local economy and add to the level of activity that makes our downtown buzz already."

– The Mining Journal. "Revitalization Projects to Bring New Housing Options to U.P. Communities." Houghton, Michigan

Direct Community Investment and Placemaking

LIMITATIONS OF CONTEMPORARY IMPACT MEASUREMENT METHODS

From time to time, MEDC and its national state-level peers employ the Regional Economic Models, Inc. Policy Insight Model (REMI PI+) to conduct direct economic input/output and fiscal impact analysis of its economic investments.[10] The REMI PI+ model utilizes multipliers derived from the industrial classification makeup of a regional economy to allow estimation of the impacts of investments on a wide array of activities: construction and consumer spending, business, personal and sales tax receipts, employment, and tourism, among others.

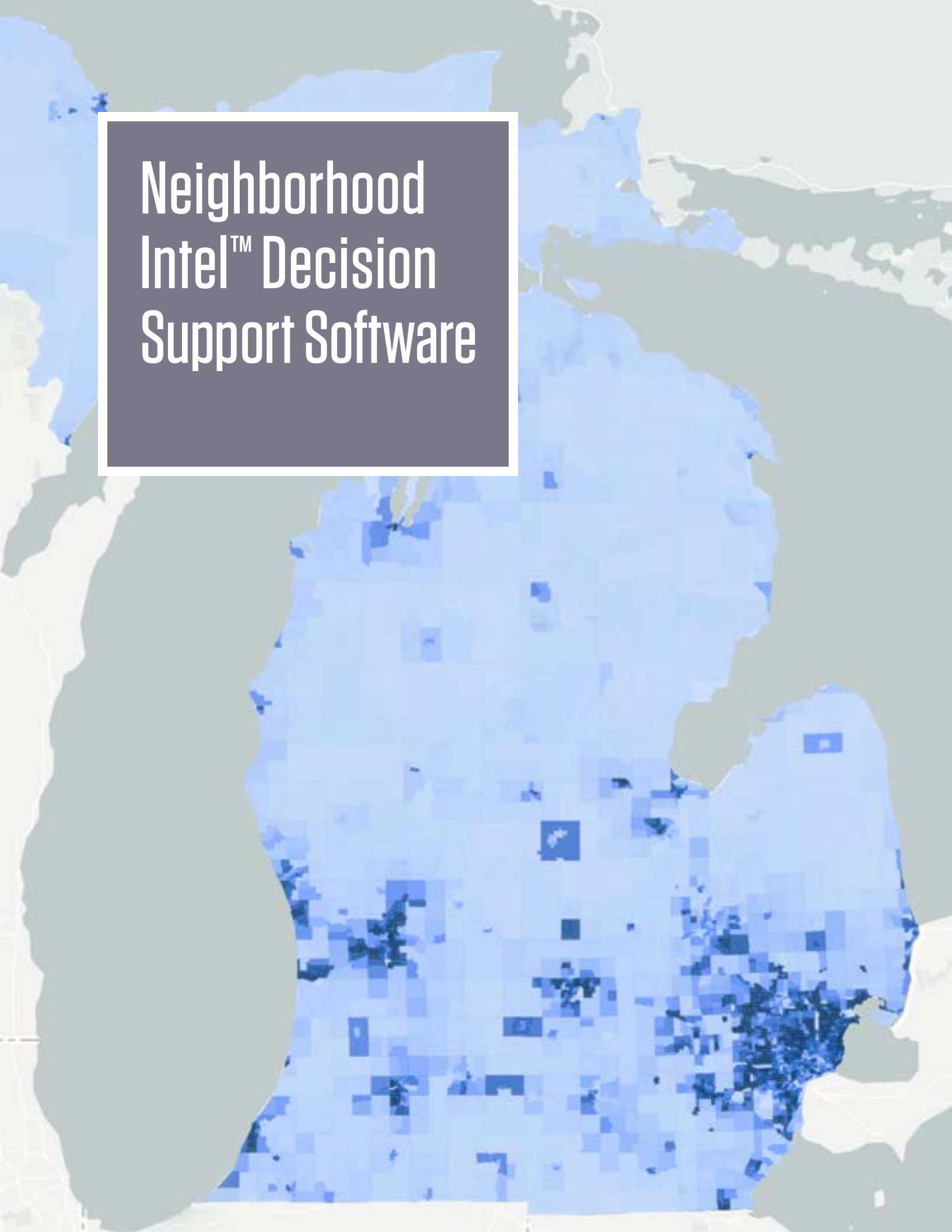
While the REMI PI+ model approach is a robust and well-understood direct economic impact modeling method, it has one significant and well-understood limitation: REMI PI+ Modeling cannot test for or measure the magnitude of the spatial externality impact that investments have on surrounding properties.[11] In other words, if an MEDC investment creates an amenity (e.g. increased quality or sense of place), removes a disamenity (e.g. demolition of blight or dilapidation), or both, the REMI PI+ model cannot capture whether or by how much the surrounding properties rise in value or if surrounding occupancy rates rise as a consequence of the investment activity. One of the most proven and best tools for measuring property value impacts of amenities—both internal and external—is hedonic property value analysis.[12, i] The difference-in-differences (DID) method is a strong method for measuring the occupancy rate impacts of an investment. As a result, if MEDC relies solely on REMI PI+ modeling to measure the impacts of its investments, it will significantly underestimate the impacts of its work.

MEDC does not generally employ the REMI PI+ model in connection with site or project selection for CDI Programs. Instead, all prospective MEDC community development projects are evaluated on the following criteria to identify high priority projects: local and regional economic impact considerations, place considerations, and financial considerations.[13] MEDC also employs "MiScorecard" metrics[14] composed of traditional qualitative and quantitative factors of economic development deals: deal size, job creation, project square footage, geographic distribution across the state, surveys of local stakeholders, etc. While tracking such measures is an important exercise from the practical aspects of programming, such as local stakeholder participation and maintaining balance of investments amongst Michigan's communities, these evaluative metrics do not tell MEDC much about the impact of its investments after they occur.

Dynamo Metrics' approach centers on spatial externality analysis that leverages extensive data and technology infrastructure to deliver on-demand evaluative and predictive impact metrics. As a result, estimating the impacts of past or prospective MEDC CDI investments on surrounding properties is one click away. Spatial externality analyses such as hedonic modeling and the DID method do not supplant REMI PI+ modeling or traditional qualitative and quantitative analysis, but instead complement them. Measuring impacts on nearby properties is the blind spot of REMI PI+ modeling and is not a consideration under current MEDC CDI site selection or program evaluation. A more robust and accurate estimation of the impacts of past and potential MEDC CDI investments would be achieved by combining REMI PI+ modeling analysis or traditional measurements like the MiScorecard metrics alongside Dynamo's spatial impact metrics.

"In order for any project to succeed, the development team relies on strategic skills and resources to overcome governmental, economic, design and community challenges. The Corner given the iconic nature of the historic site as well as our innovative construction approach required even great strategic support. The MEDC effectively facilitated more than just economic support, but information, additional opportunities and even removed roadblocks to bring the project to reality."

– Eric B. Larson, President/CEO, Larson Realty Group



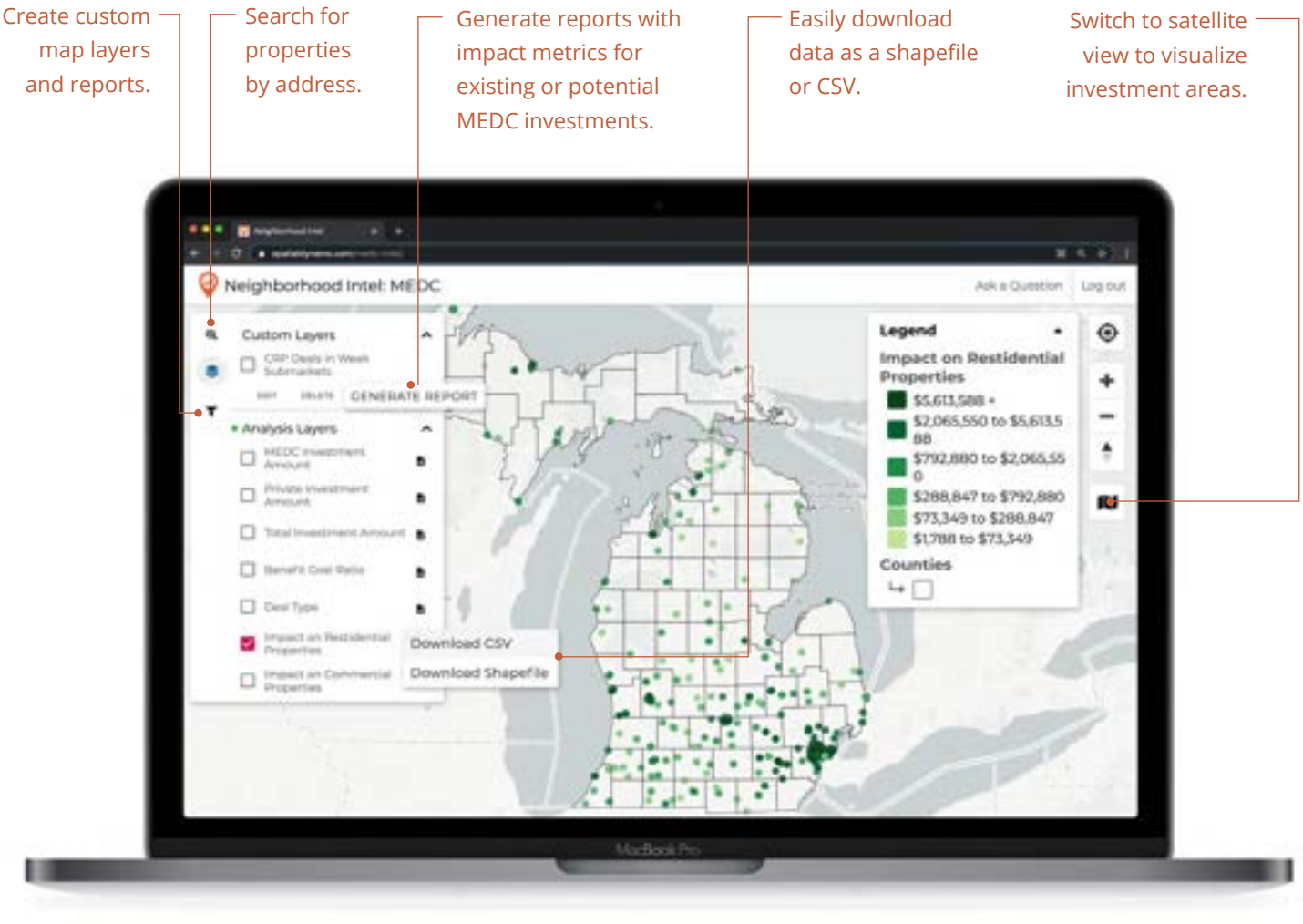
Neighborhood Intel™ Decision Support Software

Neighborhood Intel™ Decision Support Software

Dynamo Metrics' Neighborhood Intel software allows users to explore the results of this study and predict the impact of future projects. The results of this study have been incorporated into Neighborhood Intel to help guide future MEDC investments.

MEDC's Neighborhood Intel platform can be used for two key activities:

1. Reporting the impact of MEDC's completed CDI deals
2. Predicting the impact of future MEDC CDI deals



Log in to MEDC's Neighborhood Intel platform at:
www.dynamo.city/medc-intel

Neighborhood Intel™ Decision Support Software

1. Using Neighborhood Intel to Report on Project Impact

Neighborhood Intel empowers users to dig deeper into the results of this study.

With MEDC's Neighborhood Intel platform, users can:

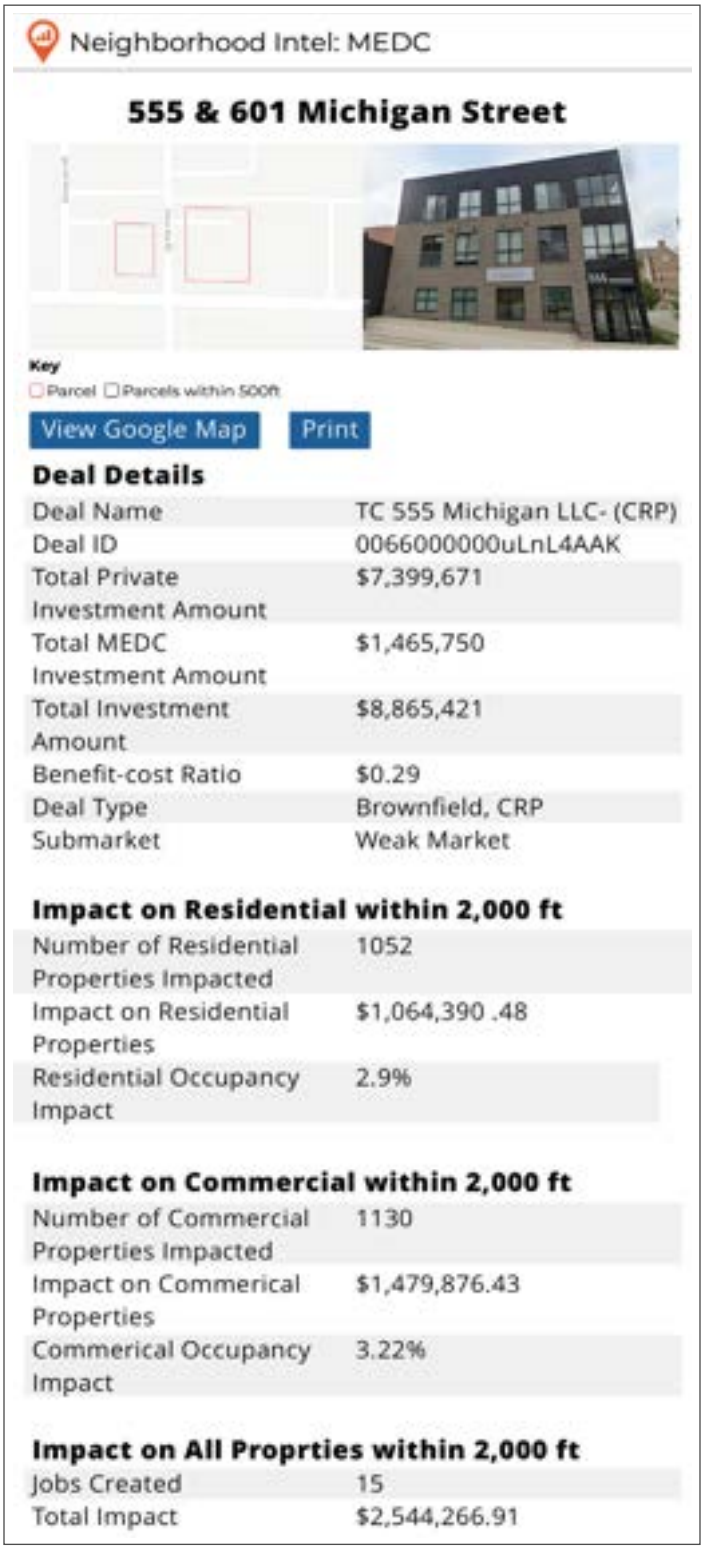
- Explore individual completed projects and their estimated impacts on surrounding properties.
- Generate multi-project reports detailing completed project impact in a given area or time-period.
- Share results with MEDC, state of Michigan, local community and other stakeholders.

2. Using Neighborhood Intel to Evaluate Future Project Impact

Neighborhood Intel empowers users to predict the impact of prospective investments on residential and commercial property values based on the total project amount.

With MEDC's Neighborhood Intel platform, users can:

- Predict project impacts to evaluate potential deals.
- Generate reports on the predicted impact of new or potential MEDC investments.
- Share results with MEDC, state of Michigan, local community and other stakeholders.





"Dynamo Metrics fills a critical gap in our decision-making process for decisions about development, and has potential to influence planning and decision making around a variety of factors we weren't able to effectively quantify previously."

— Doug Matthews, Assistant City Manager & CAO, The City of Grand Rapids

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"If you want to have greater impact, this [Neighborhood Intel] is the tool that's going to help you do it. You're going to know how much impact you're having, and you're going to immediately gain insights that help you better target your resources."

— Chris Lussier, Community Development Manager, The City of Battle Creek

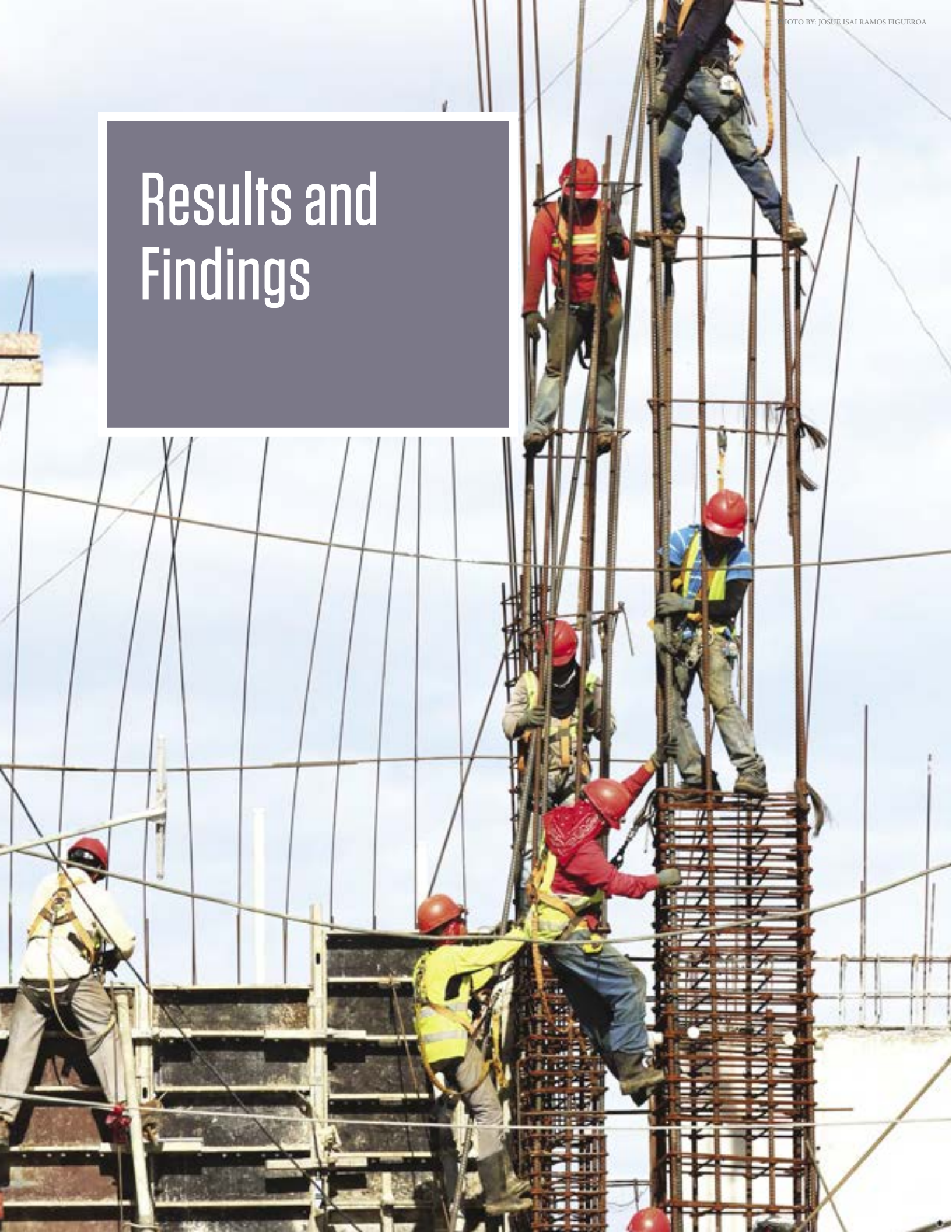


PHOTO BY: JOSUE ISAI RAMOS FIGUEROA

Results and Findings

Property Value Impact of MEDC Community Development Incentives

Results from the empirical analysis are split into two categories: (1) property value impact findings from the final residential and commercial hedonic price functions; and, (2) the occupancy rate impact findings from the final residential and commercial DID functions. Findings from the hedonic analysis are much more robust because reporting on findings are so unique inside and outside each of the six cities.

After conducting a statewide census-tract level submarket analysis, we selected six Michigan cities as representative of MEDC Community Development Incentives (CDI) investment locations across the state—representing a variety of population sizes and economic health—for use in building a statewide MEDC CDI property impact valuation framework.[15, j]

The results of these methods laid the groundwork for the hedonic property value analysis. We then developed comprehensive property-level time-series data specifications for Detroit, Grand Rapids, Lansing, Marquette, Adrian, and Alpena (collectively, the "six cities"), with the collaboration of MEDC and those local governments to allow us to perform the hedonic models. The nearby property value impact estimates caused by MEDC CDI deals derived from the Q1 2011–Q4 2017 empirical analysis period were applied to MEDC CDI activity in the six cities during the full study period of 2008–2019. Results from the empirical analysis are displayed in the sections below by six city, large city, small city, individual city, and statewide.

Six Cities

Detroit, Grand Rapids, Lansing,
Marquette, Adrian, and Alpena

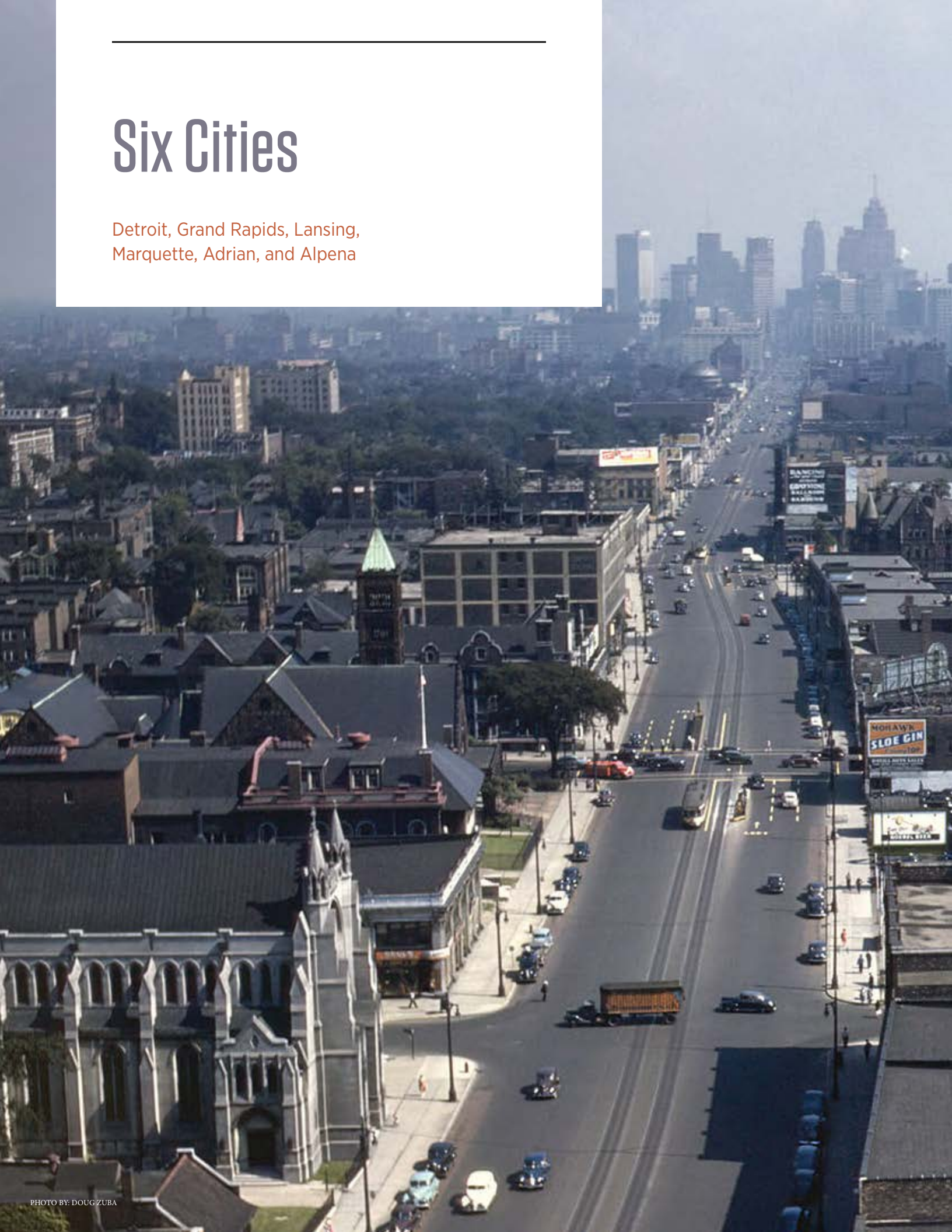


PHOTO BY: DOUG ZUBA



TOTAL PROPERTY VALUE IMPACT
$3,864,786,405

$3,205,555,894
COMMERICAL PROPERTY VALUE IMPACT

$659,230,511
TOTAL RESIDENTIAL PROPERTY VALUE IMPACT

MEDC INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER MEDC DOLLAR INVESTED

$1 = $6.18

Weak Submarket	$1 = $5.24	$214,886,966	MEDC INVESTMENT
Middle Submarket	$1 = $7.43	$286,771,032	MEDC INVESTMENT
Strong Submarket	$1 = $4.93	$123,352,926	MEDC INVESTMENT

TOTAL INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER TOTAL INVESTMENT DOLLAR INVESTED

$1 = $1.19

Weak Submarket	$1 = $1.17	$958,658,487	TOTAL INVESTMENT
Middle Submarket	$1 = $1.44	$1,482,756,994	TOTAL INVESTMENT
Strong Submarket	$1 = $0.76	$801,392,911	TOTAL INVESTMENT

Property Value Impact of MEDC Community Development Incentives

SIX CITIES: DETROIT, GRAND RAPIDS, LANSING, MARQUETTE, ADRIAN, AND ALPENA

TABLE 1 provides key components calculated across all 176 deals in the six cities as well as an overview of total deal counts and investment levels split into submarkets from our aggregate six-city empirical analysis. This table also provides a sense of the distribution of MEDC CDI deals and resources across varying types of submarkets with the amount of private sector investment that was drawn into deals across those markets.

TABLE 1: MEDC COMMUNITY DEVELOPMENT INCENTIVES (CDI) SIX CITY STUDY AREA INVESTMENT AND DEAL COUNT BY REAL ESTATE SUBMARKET, 2008–2019

Coverage	Deal Count	Total Investment	MEDC Investment	Private Investment	MEDC Leverage Ratio
Six-city Wide	176	$3,242,808,392	$625,010,924	$2,617,750,023	$4.19
Weak Submarket	85	$958,658,487	$214,886,966	$743,765,241	$3.46
Middle Submarket	61	$1,482,756,994	$286,771,032	$1,195,944,797	$4.17
Strong Submarket	30	$801,392,911	$123,352,926	$678,039,985	$5.50

TABLE 2 provides aggregated commercial and residential property value impacts within 2,000 feet of MEDC six-city investment sites, as well as total investment and MEDC investment benefit-cost ratios (BCRs). BCRs can be used to estimate the overall impact of a total investment by quantifying new value creation for all nearby properties.

TABLE 2: SIX-CITY BENEFIT-COST RATIOS (BCRS) FOR MEDC INVESTMENT DEALS AND TOTAL IMPACT WITHIN 2,000 FEET OF INVESTMENT SITES, MI, 2008–2019

Coverage		Total Investment	MEDC Investment	Total Impact	Total Investment BCR	MEDC Investment BCR	MEDC Investment as a Proportion of Deals
Six-city Wide	**Total**	$3,242,808,392	$625,010,924	**$3,864,786,405**	**1.19**	**6.18**	19.27%
	Commercial			$3,205,555,894	0.99	5.13	
	Residential			$659,230,511	0.2	1.05	
Weak Submarket	**Total**	$958,658,487	$214,886,966	**$1,125,465,815**	**1.17**	**5.24**	22.42%
	Commercial			$860,241,092	0.9	4.00	
	Residential			$265,224,723	0.28	1.23	
Middle Submarket	**Total**	$1,482,756,994	$286,771,032	**$2,130,617,566**	**1.44**	**7.43**	19.34%
	Commercial			$1,768,828,661	1.19	6.17	
	Residential			$361,788,904	0.24	1.26	
Strong Submarket	**Total**	$801,392,911	$123,352,926	**$608,703,024**	**0.76**	**4.93**	15.39%
	Commercial			$576,486,141	0.72	4.67	
	Residential			$32,216,884	0.04	0.26	

Table 2 also provides a summary of overall property value created for each dollar invested across submarkets in the six cities. Findings suggest highest returns per dollar invested in the middle submarket. It is also important to point out that although the total investment BCR is less than $1.00 returned for each total dollar invested in the strong submarket, it is still all ancillary and positive external value creation to nearby properties that is in addition to the direct investment. In other words, the existence of positive externalities in the form of increased nearby property values have never been quantified as a result of economic development investment and are thus all in addition to any standard direct calculations of economic impact from economic development investment.

Property Value Impact of MEDC Community Development Incentives

SIX CITIES: DETROIT, GRAND RAPIDS, LANSING, MARQUETTE, ADRIAN, AND ALPENA

TABLE 3 also shows that the average count of commercial properties within 2,000 feet of MEDC investment sites tends to be much lower than residential properties, which is logical given the average size of commercial properties tends to be larger than the average size of residential properties. Commercial property value impact multipliers (PVIMs) are consistently higher than residential PVIMs, thus suggesting that investment impact on nearby commercial properties has a greater effect on a per unit basis.

TABLE 3: AVERAGE SIX CITY PROPERTY VALUE IMPACT MULTIPLIERS (PVIMS) FOR ALL COMMERCIAL & RESIDENTIAL PROPERTIES WITHIN 2,000 FEET OF MEDC INVESTMENT SITES, 2008–2019

	Average Commercial PVIM Stats				Average Residential PVIM Stats			
	Average Count of Commercial Properties	Average Value of Commercial Properties	Average Commercial PVIM	Average Percent Value Impact on Each Commercial Property	Average Count of Residential Properties	Average Value of Residential Properties	Average Residential PVIM	Average Percent Value Impact on Each Residential Property
Six-city Wide	33	$2,164,367	1.34	25.37%	430	$96,284	1.1	9.04%
Weak Submarket	41	$1,145,834	1.28	21.65%	696	$72,470	1.07	6.19%
Middle Submarket	26	$4,356,056	1.34	25.59%	235	$176,545	1.18	14.28%
Strong Submarket	26	$2,232,027	1.49	32.94%	74	$291,216	1.05	4.98%

Table 3 dives deeper into property level impacts by providing commercial and residential PVIMs across the six cities and submarkets. The PVIMs derived from empirical hedonic analysis can be used to estimate the value of a given property one year or more after an MEDC project breaks ground based on its current value and proximity to the MEDC investment site. For example, if a commercial property in a middle submarket is worth $1 million today, is within 2,000 feet of an MEDC investment site, and has a commercial PVIM of 1.34, then the property will be worth an estimated $1.34 million one year or greater after the investment.

Large Cities

Detroit, Grand Rapids,
and Lansing

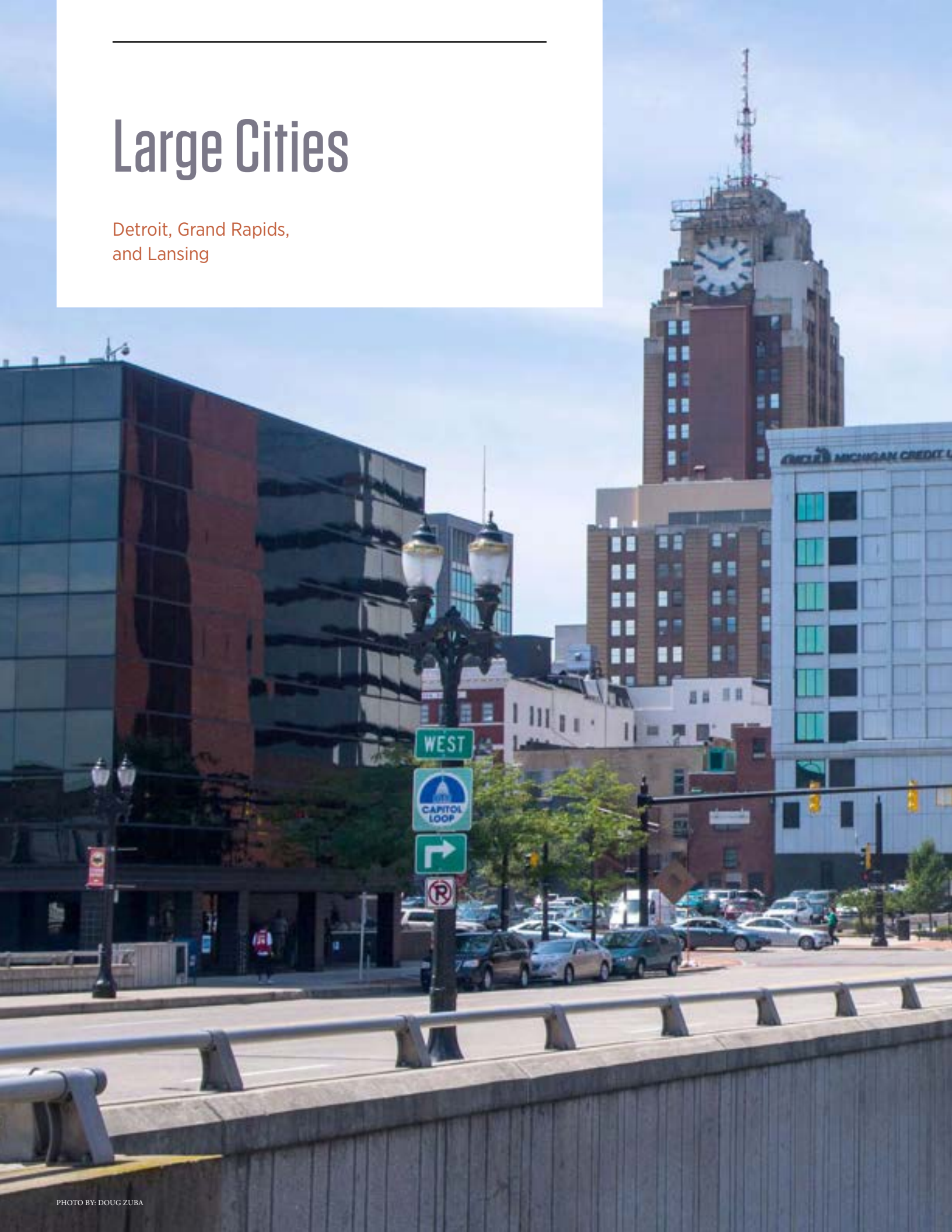
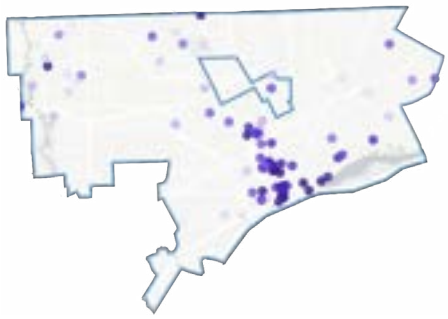
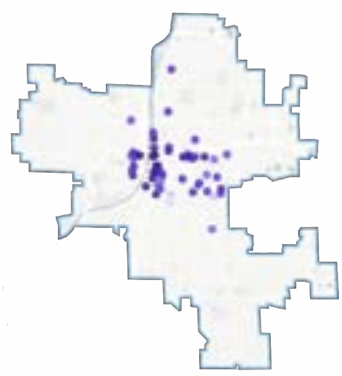
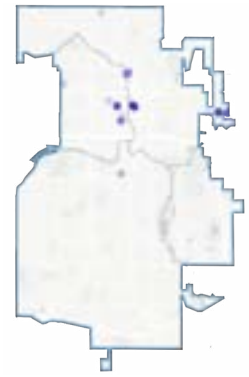


PHOTO BY: DOUG ZUBA

DETROIT	GRAND RAPIDS	LANSING
Population: 647,800 Size: 143 mi²	Population: 198,400 Size: 46 mi²	Population: 117,200 Size: 37 mi²







TOTAL PROPERTY VALUE IMPACT
$3,753,334,856

$3,140,403,299
COMMERICAL PROPERTY VALUE IMPACT

$612,931,557
TOTAL RESIDENTIAL PROPERTY VALUE IMPACT

MEDC INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER MEDC DOLLAR INVESTED

$1 = $6.96

Weak Submarket	$1 = $5.30	$207,194,240	MEDC INVESTMENT
Middle Submarket	$1 = $9.83	$209,097,272	MEDC INVESTMENT
Strong Submarket	$1 = $4.87	$123,124,176	MEDC INVESTMENT

TOTAL INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER TOTAL INVESTMENT DOLLAR INVESTED

$1 = $1.28

Weak Submarket	$1 = $1.17	$938,442,959	TOTAL INVESTMENT
Middle Submarket	$1 = $1.72	$1,197,915,497	TOTAL INVESTMENT
Strong Submarket	$1 = $0.75	$800,648,155	TOTAL INVESTMENT

Property Value Impact of MEDC Community Development Incentives

LARGE CITIES: DETROIT, GRAND RAPIDS, AND LANSING

TABLE 4 provides key components calculated across all 155 deals in the large cities as well as an overview of total deal counts and investment levels split into submarkets from our empirical analysis. This table also provides a sense of the distribution of MEDC CDI deals and resources across varying types of submarkets as well as the amount of private sector leveraged investment that was drawn into deals across those markets.

TABLE 4: MEDC COMMUNITY DEVELOPMENT INCENTIVES (CDI) STUDY AREA LARGE CITIES INVESTMENT AND DEAL COUNT BY REAL ESTATE SUBMARKET, 2008–2019

Coverage	Deal Count	Total Investment	MEDC Investment	Private Investment	MEDC Leverage Ratio
Large-city Wide	155	$2,937,006,611	$539,415,688	$2,397,590,923	$4.44
Weak Submarket	72	$938,442,959	$207,194,240	$731,248,719	$3.53
Middle Submarket	54	$1,197,915,497	$209,097,272	$988,818,225	$4.73
Strong Submarket	29	$800,648,155	$123,124,176	$677,523,979	$5.50

TABLE 5 provides aggregated commercial and residential property value impacts within 2,000 feet of MEDC large city investment sites, as well as total investment and MEDC investment benefit-cost ratios (BCRs). BCRs can be used to estimate the overall impact of a total investment by quantifying new value creation for all nearby properties.

TABLE 5: LARGE CITIES BENEFIT-COST RATIOS (BCRS) FOR MEDC INVESTMENT DEALS AND TOAL IMPACT WITHIN 2,000 FEET OF INVESTMENT SITES, MI, 2008–2019

Coverage		Total Investment	MEDC Investment	Total Impact	Total Investment BCR	MEDC Investment BCR	MEDC Investment as a Proportion of Deals
Large-city Wide	**Total**	$2,937,006,611	$539,415,688	**$3,753,334,856**	**1.28**	**6.96**	18.37%
	Commercial			$3,140,403,299	1.07	5.82	
	Residential			$612,931,557	0.21	1.14	
Weak Submarket	**Total**	$938,442,959	$207,194,240	**$1,098,078,528**	**1.17**	**5.3**	22.08%
	Commercial			$840,941,846	0.9	4.06	
	Residential			$257,136,682	0.27	1.24	
Middle Submarket	**Total**	$1,197,915,497	$209,097,272	**$2,055,424,845**	**1.72**	**9.83**	17.46%
	Commercial			$1,729,937,949	1.44	8.27	
	Residential			$325,486,896	0.27	1.56	
Strong Submarket	**Total**	$800,648,155	$123,124,176	**$599,831,483**	**0.75**	**4.87**	15.38%
	Commercial			$569,523,503	0.71	4.63	
	Residential			$30,307,980	0.04	0.25	

Table 5 also provides a summary of overall property value created for each dollar invested in total and across submarkets in the large study cities.

Findings suggest highest returns per dollar invested in the middle submarket.

Property Value Impact of MEDC Community Development Incentives

LARGE CITIES: DETROIT, GRAND RAPIDS, AND LANSING

It is important to point out that although less than $1.00 is returned for each total dollar invested in the strong submarket, it is still all ancillary and positive external value creation that is in addition to the direct investment. In other words, the existence of positive externalities in the form of increased nearby property values have never been quantified as a result of economic development investment and are thus all in addition to any standard direct calculations of economic impact from economic development investment.

TABLE 6 dives deeper into property level value impacts by providing commercial and residential property value impact multipliers (PVIMs) large-city wide and across real estate submarkets. The PVIMs derived from empirical hedonic analysis can be used to estimate the value of an individual property one year or greater after an MEDC project breaks ground based on its current value and proximity to the MEDC investment site. For example, if a commercial property in a weak submarket is worth $1 million today, is within 2,000 feet of an MEDC investment site, and has a commercial PVIM of 1.28, then the property will be worth an estimated $1.28 million one year or greater after the investment.

Table 6 also shows that the count of commercial properties within 2,000 feet of MEDC investment sites tends to be much lower than residential properties, which is logical given the average size of commercial properties tends to be larger than the average size of residential properties. Commercial PVIMs are consistently higher than residential PVIMs, thus suggesting that investment impact on nearby commercial properties has a greater effect on a per unit basis.

TABLE 6: AVERAGE LARGE CITIES PROPERTY VALUE IMPACT MULTIPLIERS (PVIMS) FOR ALL COMMERCIAL & RESIDENTIAL PROPERTIES WITHIN 2,000 FEET OF MEDC INVESTMENT SITES, 2008–2019

	Average Commercial PVIM Stats				Average Residential PVIM Stats			
	Average Count of Commercial Properties	Value of Commercial Properties	Commercial PVIM	Percent Value Impact on Each Commercial Property	Count of Residential Properties	Value of Residential Properties	Residential PVIM	Percent Value Impact on Each Residential Property
Large-city Wide	34	$2,351,906	1.34	25.36%	465	$94,504	1.1	8.99%
Weak Submarket	43	$1,248,560	1.28	21.63%	800	$72,442	1.07	6.16%
Middle Submarket	26	$4,780,564	1.34	25.54%	234	$163,268	1.19	15.79%
Strong Submarket	25	$2,344,305	1.49	33.05%	66	$304,709	1.05	5.19%

When our large representative cities are considered individually, findings suggest that BCR are higher in cities with lower residential property values while PVIMs stay relatively consistent across all cities as relative values vary.

Small Cities

Marquette, Adrian, and Alpena

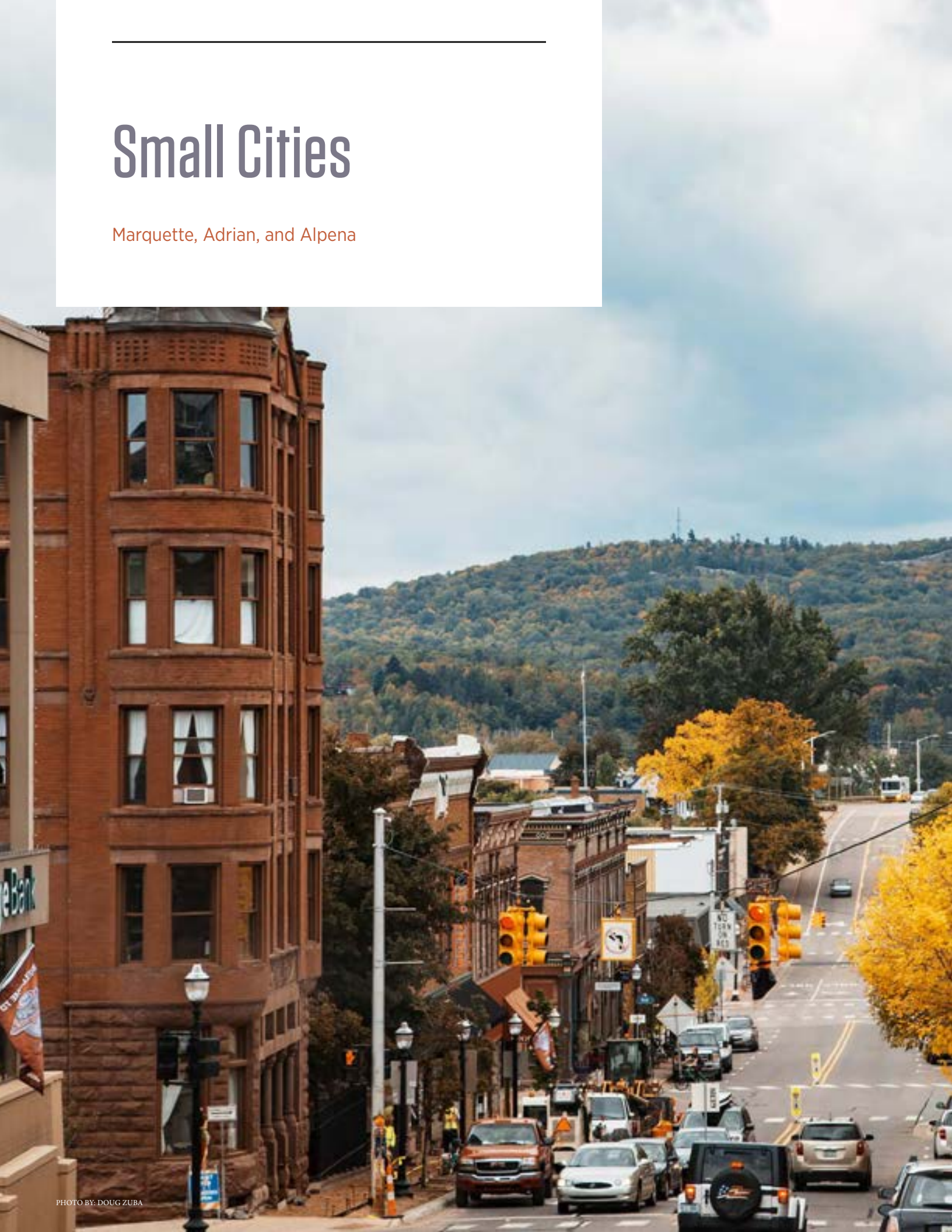
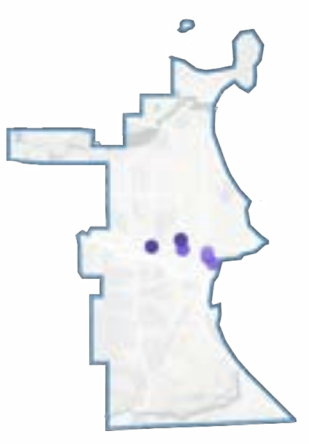
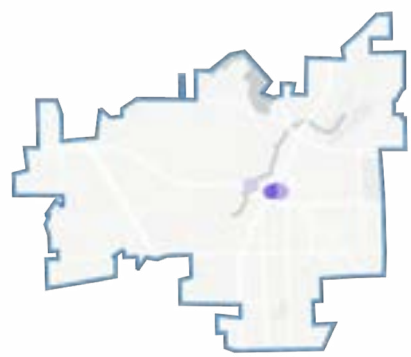
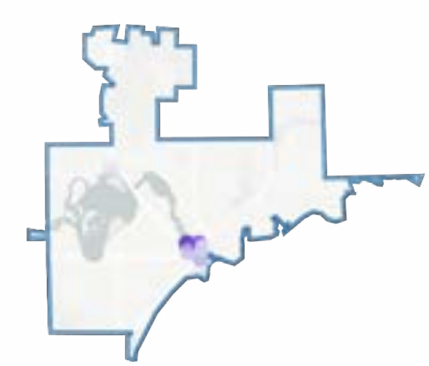


PHOTO BY: DOUG ZUBA

MARQUETTE	ADRIAN	ALPENA
Population: 20,800 Size: 19 mi²	Population: 20,600 Size: 8 mi²	Population: 10,000 Size: 9 mi²







TOTAL PROPERTY VALUE IMPACT
$111,451,549

$65,152,595
COMMERICAL PROPERTY VALUE IMPACT

$46,298,954
TOTAL RESIDENTIAL PROPERTY VALUE IMPACT

MEDC INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER MEDC DOLLAR INVESTED

$1 = $1.30

Weak Submarket	$1 = $3.56	$7,692,726	MEDC INVESTMENT
Middle Submarket	$1 = $0.97	$77,673,760	MEDC INVESTMENT
Strong Submarket	$1 = $38.78	$228,750	MEDC INVESTMENT

TOTAL INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER TOTAL INVESTMENT DOLLAR INVESTED

$1 = $0.36

Weak Submarket	$1 = $1.35	$20,215,528	TOTAL INVESTMENT
Middle Submarket	$1 = $0.26	$284,841,497	TOTAL INVESTMENT
Strong Submarket	$1 = $11.91	$744,756	TOTAL INVESTMENT

Property Value Impact of MEDC Community Development Incentives

SMALL CITIES: MARQUETTE, ADRIAN, AND ALPENA

TABLE 7 provides key components calculated across all 21 deals made in the small representative cities during the study period as well as an overview of total deal counts and investment levels split into submarkets from our empirical analysis. This table also provides a sense of the distribution of MEDC CDI deals and resources across the varying submarkets and the amount of private sector leveraged investment that was drawn into deals across those markets.

TABLE 7: MEDC COMMUNITY DEVELOPMENT INCENTIVES (CDI) STUDY AREA SMALL CITIES INVESTMENT AND DEAL COUNT BY REAL ESTATE SUBMARKET, 2008–2019

Coverage	Deal Count	Total Investment	MEDC Investment	Private Investment	MEDC Leverage Ratio
Small-city Wide	21	$305,801,781	$85,595,236	$220,191,540	$2.57
Weak Submarket	13	$20,215,528	$7,692,726	$12,516,522	$1.63
Middle Submarket	7	$284,841,497	$77,673,760	$207,159,012	$2.67
Strong Submarket	1	$744,756	$228,750	$516,006	$2.26

TABLE 8 provides aggregated commercial and residential property-value impacts within 2,000 feet of MEDC investment sites, as well as total investment and MEDC investment benefit-cost ratios (BCRs). BCRs can be used to estimate the overall impact of a total investment by quantifying new value creation for all nearby properties.

TABLE 8: SMALL CITIES BENEFIT-COST RATIOS (BCRS) FOR MEDC INVESTMENT DEALS AND TOTAL IMPACT WITHIN 2,000 FEET OF INVESTMENT SITES, MI, 2008–2019

Coverage		Total Investment	MEDC Investment	Total Impact	Total Investment BCR	MEDC Investment BCR	MEDC Investment as a Proportion of Deals
Small-city Wide	**Total**	$305,801,781	$85,595,236	**$111,451,549**	**0.36**	**1.30**	27.99%
	Commercial			$65,152,595	0.21	0.76	
	Residential			$46,298,954	0.15	0.54	
Weak Submarket	**Total**	$20,215,528	$7,692,726	**$27,387,288**	**1.35**	**3.56**	38.05%
	Commercial			$19,299,246	0.95	2.51	
	Residential			$8,088,042	0.4	1.05	
Middle Submarket	**Total**	$284,841,497	$77,673,760	**$75,192,721**	**0.26**	**0.97**	27.27%
	Commercial			$38,890,712	0.14	0.50	
	Residential			$36,302,009	0.13	0.47	
Strong Submarket	**Total**	$744,756	$228,750	**$8,871,541**	**11.91**	**38.78**	30.71%
	Commercial			$6,962,637	9.35	30.44	
	Residential			$1,908,904	2.56	8.34	

Table 8 also provides a summary of overall property value created for each dollar invested in total and across submarkets in the small study cities.

Findings suggest highest returns per dollar invested in the strongest submarket.

Property Value Impact of MEDC Community Development Incentives

SMALL CITIES: MARQUETTE, ADRIAN, AND ALPENA

It is important to point out that those returns come from a single investment made in one of Marquette's strong submarket zones. With only 21 total investments across small cities in the study, findings concerning BCR results from a single deal are difficult to heavily rely on.

The property value impact multipliers (PVIMs) tend to be a better source of understanding impact in small cities since the PVIMs are consistent in how they impact each nearby residential and commercial property value regardless of density and value of properties, while BCRs rely so heavily on varying small town landscapes (see Table 9 for PVIMs). It is also important to point out that although the total investment BCR is less than $1.00 is returned for each total dollar invested overall, in the small-city wide total, and middle submarkets, it is still all ancillary and positive external value creation to nearby properties that is additional to the impact of the direct investment. In other words, the existence of positive externalities in the form of increased nearby property values have never been quantified as a result of economic development investment and are thus all in addition to any standard direct calculations of economic impact from economic development investment.

TABLE 9 dives deeper into property level value impacts by providing commercial and residential PVIMs small-city wide and across submarkets. The PVIMs derived from empirical hedonic analysis can be used to estimate the value of a given property one year or greater after an MEDC project breaks ground based on its current value and proximity to the MEDC investment site. For example, if a commercial property in a middle submarket is worth $1 million today, is within 2,000 feet of an MEDC investment site, and has a commercial PVIM of 1.39, then the property will be worth an estimated $1.39 million one year or greater after the investment.

Table 9 also shows that the average count of commercial properties within 2,000 feet of MEDC investment sites tends to be much lower than residential properties, which is logical given the average size of commercial properties tends to be larger than the average size of residential properties. Commercial PVIMs are consistently higher than residential PVIMs, thus suggesting that investment impact on nearby commercial properties has a greater effect on a per unit basis.

TABLE 9: AVERAGE SMALL CITIES PROPERTY VALUE IMPACT MULTIPLIERS (PVIMS) FOR ALL COMMERCIAL & RESIDENTIAL PROPERTIES WITHIN 2,000 FEET OF MEDC INVESTMENT SITES, 2008–2019

	Average Commercial PVIM Stats				Average Residential PVIM Stats			
	Count of Commercial Properties	Value of Commercial Properties	Commercial PVIM	Percent Value Impact on Each Commercial Property	Count of Residential Properties	Value of Residential Properties	Residential PVIM	Percent Value Impact on Each Residential Property
Small-city Wide	27	$437,824	1.35	26.02%	169	$132,346	1.11	9.83%
Weak Submarket	27	$239,631	1.3	22.82%	117	$73,551	1.08	7.20%
Middle Submarket	24	$817,649	1.39	27.98%	133	$171,236	1.14	12.28%
Strong Submarket	49	$547,856	1.35	25.94%	305	$206,500	1.03	3.03%

When our small cities are considered individually, findings suggest that BCRs are higher in the cities with lower residential property values while PVIMs stay relatively consistent across all cities as relative values vary.

Detroit

MEDC invested $272,330,195 and attracted $1,214,053,964 of private investment across 82 deals in Detroit from 2008–2019. Leveraging $4.46 in private investment per $1.00 invested, the total investment during the study period was $1,486,384,159.

The 82 deals impacted nearby commercial property values by $2,401,185,409 and nearby residential property values by $318,899,331, for a sum total of $2,720,084,740 in nearby property value impact. In other words, our analysis suggests that had the 82 deals not occurred, the properties near those sites would in the aggregate have been worth $2,720,084,740[16] less. The total investment benefit-cost ratio (BCR) is 1.83, meaning $1.83 in property value was created for every $1.00 of total investment.

When looking at MEDC investment alone, the BCR is 9.99, meaning $9.99 in property value was created for every $1.00 of MEDC investment. These are the highest overall BCR observed in this study. This high rate of return is in large part the result of deal site selection near dense concentrations of high-value commercial properties.

Detroit's overall rate of return is far and away the highest rate of return observed in this study.



PHOTO BY: DOUG ZUBA

Neighborhood Intel: MEDC





70 West Alexandrine, Detroit

Strathmore Apartments LDHA LLC- The Strathmore Redevelopment (CRP)

TOTAL INVESTMENT
$31,946,000

MEDC INVESTMENT
$3,500,000

PRIVATE INVESTMENT
$28,446,000

COMBINED IMPACT
$53,486,233

COMMERCIAL IMPACT
$48,601,218

RESIDENTIAL IMPACT
$4,885,015

TOTAL PROPERTY VALUE IMPACT
$2,720,084,740

$2,401,185,409
COMMERICAL PROPERTY VALUE IMPACT

$318,899,331
TOTAL RESIDENTIAL PROPERTY VALUE IMPACT

MEDC INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER MEDC DOLLAR INVESTED

$1 = $9.99

Weak Submarket	$1 = $8.73	$69,839,507	MEDC INVESTMENT
Middle Submarket	$1 = $11.67	$154,565,826	MEDC INVESTMENT
Strong Submarket	$1 = $6.40	$47,924,862	MEDC INVESTMENT

TOTAL INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER TOTAL INVESTMENT DOLLAR INVESTED

$1 = $1.83

Weak Submarket	$1 = $1.90	$321,142,598	TOTAL INVESTMENT
Middle Submarket	$1 = $2.10	$858,909,369	TOTAL INVESTMENT
Strong Submarket	$1 = $1.00	$306,332,192	TOTAL INVESTMENT

Property Value Impact of MEDC Community Development Incentives

DETROIT

TABLE 10 provides key components calculated across all 82 deals in Detroit as well as an overview of total deal counts and investment levels split into submarkets from our empirical analysis. This table also provides a sense of the distribution of MEDC CDI deals and resources across submarkets as well as the amount of private sector leveraged investment that was drawn into deals across those submarkets.

TABLE 10: MEDC COMMUNITY DEVELOPMENT INCENTIVES (CDI) INVESTMENT AND DEAL COUNT BY REAL ESTATE SUBMARKET IN DETROIT, MI, 2008–2019

Coverage	Deal Count	Total Investment	MEDC Investment	Private Investment	MEDC Leverage Ratio
Citywide	82	$1,486,384,159	$272,330,195	$1,214,053,964	$4.46
Weak Submarket	37	$321,142,598	$69,839,507	$251,303,091	$3.60
Middle Submarket	33	$858,909,369	$154,565,826	$704,343,543	$4.56
Strong Submarket	12	$306,332,192	$47,924,862	$258,407,330	$5.39

TABLE 11 ***(see following page)*** provides aggregated commercial and residential property value impacts within 2,000 feet of MEDC investment sites as well as total investment and MEDC investment benefit-cost ratios (BCRs). BCRs can be used to estimate the overall impact of a total investment by quantifying new value creation for all nearby properties.

Table 11 also provides a summary of overall property value created for each dollar invested in total and across submarkets.

Findings suggest highest returns per dollar invested in the middle submarket, with the weaker submarket closely trailing in property value created from MEDC CDI investment.

When looking at the total investment BCR, it is important to point out that although only $1.00 is returned in new property value for each total dollar invested in the strong submarket, it is still all ancillary and positive external value creation that is in addition to the direct investment. In other words, the existence of positive externalities in the form of increased nearby property values have never been quantified as a result of economic development investment and are thus all in addition to any standard direct calculations of economic impact from economic development investment.

Property Value Impact of MEDC Community Development Incentives

DETROIT

TABLE 11: BENEFIT-COST RATIOS (BCRS) FOR MEDC INVESTMENT DEALS AND TOTAL IMPACT WITHIN 2,000 FEET OF INVESTMENT SITES IN DETROIT, MI, 2008–2019							
Coverage		Total Investment	MEDC Investment	Total Impact	Total Investment BCR	MEDC Investment BCR	MEDC Investment as a Proportion of Deals
Citywide	**Total**	$1,486,384,159	$272,330,195	**$2,720,084,740**	**1.83**	**9.99**	18.32%
	Commercial			$2,401,185,409	1.62	8.82	
	Residential			$318,899,331	0.21	1.17	
Weak Submarket	**Total**	$321,142,598	$69,839,507	**$609,996,291**	**1.9**	**8.73**	21.75%
	Commercial			$467,396,506	1.46	6.69	
	Residential			$142,599,784	0.44	2.04	
Middle Submarket	**Total**	$858,909,369	$154,565,826	**$1,803,576,418**	**2.1**	**11.67**	18.00%
	Commercial			$1,648,441,766	1.92	10.66	
	Residential			$155,134,651	0.18	1.00	
Strong Submarket	**Total**	$306,332,192	$47,924,862	**$306,512,031**	**1**	**6.40**	15.64%
	Commercial			$285,347,136	0.93	5.95	
	Residential			$21,164,895	0.07	0.44	

TABLE 12 dives deeper into property level impacts by providing average commercial and residential property value impact multipliers (PVIMs) citywide and across submarkets. The PVIMs derived from empirical hedonic analysis can be used to estimate the value of a given property one year or greater after an MEDC project breaks ground based on its current value and proximity to the MEDC investment site. For example, if a commercial property in a weak submarket is worth $1 million today, is within 2,000 feet of an MEDC investment site, and has a commercial PVIM of 1.22, then the property will be worth an estimated $1.22 million one year or greater after the investment takes place.

Table 12 also shows that the average count of commercial properties within 2,000 feet of MEDC investment sites in Detroit tends to be much lower than residential properties, which is logical given the average size of commercial properties tends to be larger than the average size of residential properties. Commercial PVIMs are consistently higher than residential PVIMs, thus suggesting that investment impact on nearby commercial properties has a great effect on a per unit basis.

TABLE 12: AVERAGE PROPERTY VALUE IMPACT MULTIPLIERS (PVIMS) FOR ALL COMMERCIAL & RESIDENTIAL PROPERTIES WITHIN 2,000 FEET OF MEDC INVESTMENT SITES IN DETROIT, MI, 2008–2019								
	Average Commercial PVIM Stats				Average Residential PVIM Stats			
	Count of Commercial Properties	Value of Commercial Properties	Commercial PVIM	Percent Value Impact on Each Commercial Property	Count of Residential Properties	Value of Residential Properties	Residential PVIM	Percent Value Impact on Each Residential Property
Citywide	36	$3,379,548	1.31	23.84%	616	$83,326	1.08	7.58%
Weak Submarket	48	$1,437,349	1.22	18.35%	1,149	$64,360	1.06	5.21%
Middle Submarket	29	$6,791,729	1.34	25.31%	201	$159,166	1.17	14.70%
Strong Submarket	21	$4,059,448	1.39	28.23%	113	$306,924	1.05	5.09%

Grand Rapids

MEDC invested $222,669,470 and attracted $1,055,186,404 in private investment across 60 deals in Grand Rapids from 2008–2019. Leveraging $4.74 in private investment per $1.00 invested, the total investment during the study period was $1,277,888,314.

The 60 deals impacted nearby commercial property values by $478,725,058 and nearby residential property values by $256,923,636, for a sum total of $735,648,695 in nearby property value impact. In other words, our analysis suggests that had the 60 deals not occurred, the properties near those sites would in the aggregate have been worth $735,648,695 less.[17] The total investment benefit-cost ratio (BCR) of 0.58, meaning $0.58 in property value was created for every $1.00 of total investment. When looking at MEDC investment alone the BCR is 3.30, meaning $3.30 in property value was created for every $1.00 of MEDC investment.

These are relatively low BCRs when compared to Lansing and Detroit—the other two large cities in the study. This relatively low BCR is likely due to higher costs of doing business in Grand Rapids and more investments in strong submarkets where deals are more expensive, making relative returns lower.

It should be noted, however, that Grand Rapids achieved a relatively high impact on nearby residential property values in both weak and middle submarkets. The result is property value impact benefits shared amongst a larger number of property owners in Grand Rapids, many of whom are single-family homeowners. This positive outcome was achieved by making the majority of deal site selections in secondary commercial corridors outside the central business district.

Property impact benefits in Grand Rapids were shared amongst a larger number of property owners, many of them single-family homeowners.

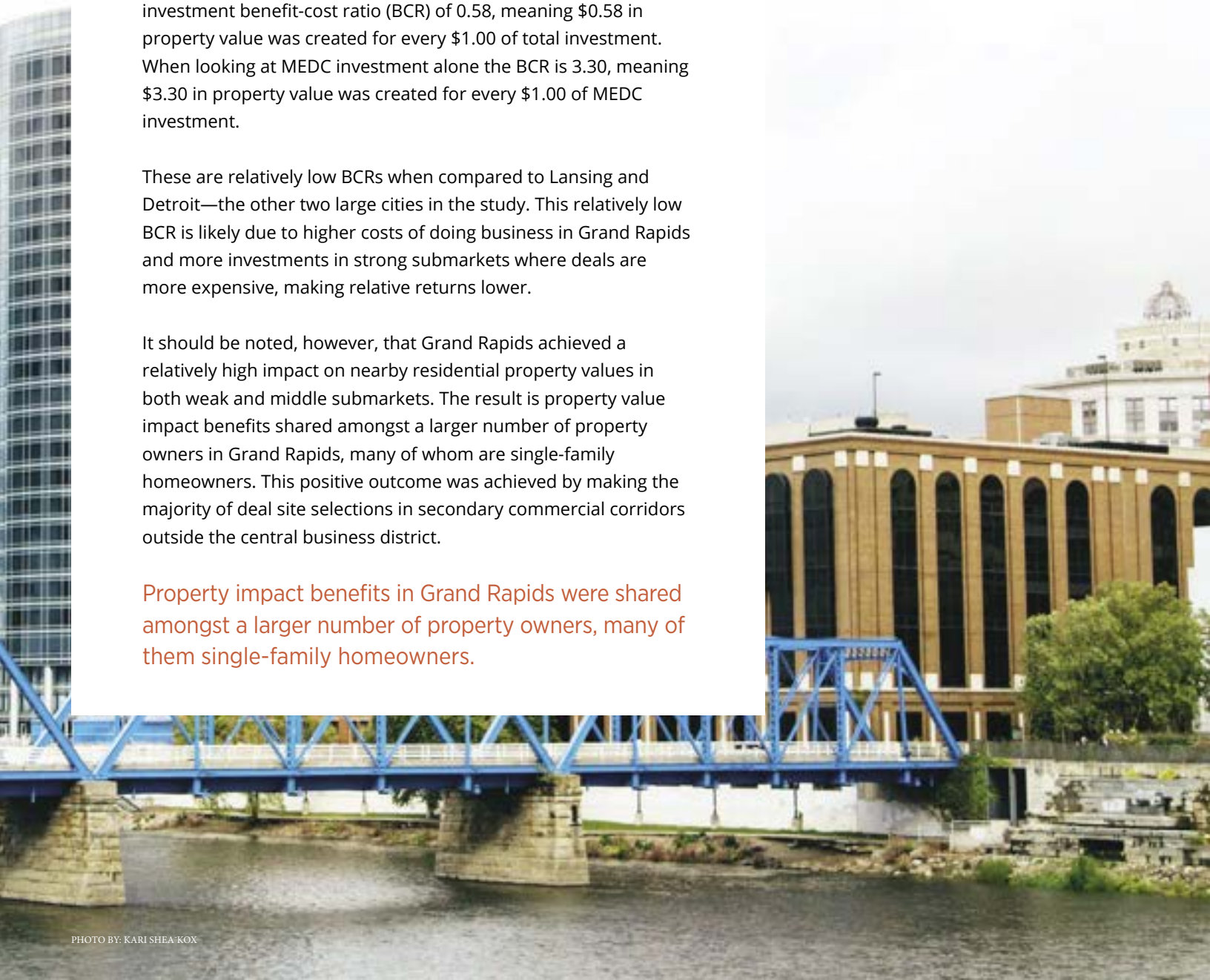
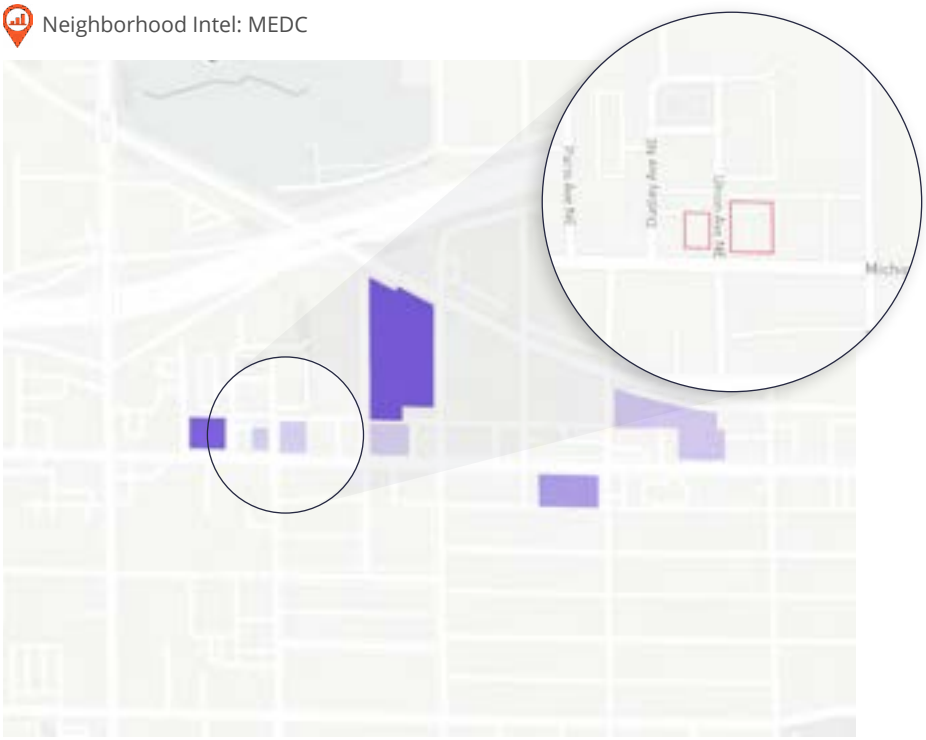


PHOTO BY: KARI SHEA KOX

Neighborhood Intel: MEDC





555 & 601 Michigan St., GR

TC 555 Michigan LLC- (CRP)
Brownfield, CRP

TOTAL INVESTMENT
$8,865,421

MEDC INVESTMENT
$1,465,750

PRIVATE INVESTMENT
$7,399,671

COMBINED IMPACT
$2,544,266

COMMERCIAL IMPACT
$1,479,876

RESIDENTIAL IMPACT
$1,064,390

TOTAL PROPERTY VALUE IMPACT
$735,648,695

$478,725,058
COMMERICAL PROPERTY VALUE IMPACT

$256,923,636
TOTAL RESIDENTIAL PROPERTY VALUE IMPACT

MEDC INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER MEDC DOLLAR INVESTED

$1 = $3.30

Weak Submarket	$1 =	$1.83	$118,583,990 MEDC INVESTMENT
Middle Submarket	$1 =	$7.80	$28,886,166 MEDC INVESTMENT
Strong Submarket	$1 =	$3.98	$75,199,314 MEDC INVESTMENT

TOTAL INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER TOTAL INVESTMENT DOLLAR INVESTED

$1 = $0.58

Weak Submarket	$1 =	$0.39	$557,685,044 TOTAL INVESTMENT
Middle Submarket	$1 =	$1.00	$225,887,307 TOTAL INVESTMENT
Strong Submarket	$1 =	$0.61	$494,315,963 TOTAL INVESTMENT

Property Value Impact of MEDC Community Development Incentives

GRAND RAPIDS

TABLE 13 provides key components calculated across all 60 deals in Grand Rapids as well an overview of total deal counts and investment levels split into submarkets from our empirical analysis. This table also provides a sense of the distribution of MEDC CDI deals and resources across submarkets as well as the amount of private sector leveraged investment that was drawn into deals across submarkets.

TABLE 13: MEDC COMMUNITY DEVELOPMENT INCENTIVES (CDI) INVESTMENT AND DEAL COUNT BY REAL ESTATE SUBMARKET IN GRAND RAPIDS, MI, 2008–2019

Coverage	Deal Count	Total Investment	MEDC Investment	Private Investment	MEDC Leverage Ratio
Citywide	60	$1,277,888,314	$222,669,470	$1,055,186,404	4.74
Weak Submarket	24	$557,685,044	$118,583,990	$439,101,054	3.7
Middle Submarket	19	$225,887,307	$28,886,166	$196,968,701	6.82
Strong Submarket	17	$494,315,963	$75,199,314	$419,116,649	5.57

TABLE 14 ***(See following page)*** provides aggregated commercial and residential property value impacts within 2,000 feet of MEDC investment sites as well as total investment and MEDC investment benefit-cost ratios (BCRs). BCRs can be used to estimate the overall impact of a total investment by quantifying new value creation for all nearby properties.

Table 14 also provides overall property value impact created for each dollar invested in total and across submarkets.

Findings suggest highest returns per dollar invested in the middle submarket.

When looking at the total investment BCR, it is important to point out that although less than $1.00 is returned in new property value for each total dollar invested in the weak and strong submarkets, it is still all ancillary and positive external value creation that is in addition to the direct investment. In other words, the existence of positive externalities in the form of increased nearby property values have never been quantified as a result of economic development investment, and are thus all in addition to any standard direct calculations of economic impact from economic development investment.

Property Value Impact of MEDC Community Development Incentives

GRAND RAPIDS

TABLE 14: BENEFIT-COST RATIOS (BCRS) FOR MEDC INVESTMENT DEALS AND TOTAL IMPACT WITHIN 2,000 FEET OF INVESTMENT SITES IN GRAND RAPIDS, MI, 2008–2019							
Coverage		Total Investment	MEDC Investment	Total Impact	Total Investment BCR	MEDC Investment BCR	MEDC Investment as a Proportion of Deals
Citywide	**Total**	$1,277,888,314	$222,669,470	**$735,648,695**	**0.58**	**3.30**	17.42%
	Commercial			$478,725,058	0.37	2.15	
	Residential			$256,923,636	0.2	1.15	
Weak Submarket	**Total**	$557,685,044	$118,583,990	**$216,877,614**	**0.39**	**1.83**	21.26%
	Commercial			$129,345,931	0.23	1.09	
	Residential			$145,886,139	0.26	1.23	
Middle Submarket	**Total**	$225,887,307	$28,886,166	**$225,451,629**	**1**	**7.80**	12.79%
	Commercial			$65,202,761	0.29	2.26	
	Residential			$160,248,868	0.71	5.55	
Strong Submarket	**Total**	$494,315,963	$75,199,314	**$299,414,842**	**0.61**	**3.98**	15.21%
	Commercial			$284,176,367	0.57	3.78	
	Residential			$15,238,475	0.03	0.20	

TABLE 15 dives deeper into property level impacts by providing commercial and residential property value impact multipliers (PVIMs) citywide and across submarkets. The PVIMs derived from empirical hedonic analysis can be used to estimate the value of a given property one year or greater after an MEDC project breaks ground based on its current value and proximity to the MEDC investment site. For example, if a commercial property in a middle submarket is worth $1 million today, is within 2,000 feet of an MEDC investment site, and has a commercial PVIM of 1.45, then the property will be worth an estimated $1.45 million one year or greater after the investment takes place.

Table 15 also shows that the average count of commercial properties within 2,000 feet of MEDC investment sites in Grand Rapids tends to be much lower than residential properties, which is logical given the average size of commercial properties tends to be larger than the average size of residential properties. Commercial PVIMs are consistently higher than residential PVIMs, thus suggesting that investment impact on nearby commercial properties has a great effect on a per unit basis.

TABLE 15: AVERAGE PROPERTY VALUE IMPACT MULTIPLIERS (PVIMS) FOR ALL COMMERCIAL & RESIDENTIAL PROPERTIES WITHIN 2,000 FEET OF MEDC INVESTMENT SITES IN GRAND RAPIDS, MI, 2008–2019								
	Average Commercial Property Value Impact Multiplier Stats				Average Residential Property Value Impact Multiplier Stats			
	Count of Commercial Properties	Value of Commercial Properties	Commercial PVIM	Percent Value Impact on Each Commercial Property	Count of Residential Properties	Average Value of Residential Properties	Residential PVIM	Percent Value Impact on Each Residential Property
Citywide	26	$865,583	1.54	34.87%	272	$131,549	1.14	11.99%
Weak Submarket	27	$691,183	1.4	28.61%	416	$102,395	1.09	8.57%
Middle Submarket	23	$467,533	1.45	31.27%	303	$165,748	1.2	16.78%
Strong Submarket	29	$1,465,559	1.66	39.90%	33	$299,336	1.06	5.46%

Lansing

MEDC invested $44,416,023 and attracted $128,318,115 in private investment across 13 CDI deals in Lansing from 2008–2019. Leveraging $2.89 in private investment per $1.00 invested, the total investment during the study period was $172,734,138.

The 13 deals impacted nearby commercial property values by $260,492,831 and nearby residential property values by $37,108,590, for a sum total of $297,601,422 in nearby property value impact. In other words, our analysis suggests that had the 13 deals not occurred, the properties near those sites would in the aggregate be worth $297,601,422 less.[18] The total investment benefit-cost ratio (BCR) is 1.72, meaning $1.72 in property value was created for every $1.00 total investment. When looking at MEDC investment alone, the BCR is 6.70, meaning $6.70 in property value. These are relatively high BCRs when compared to the other cities in the study.

It is important to note that almost all return on MEDC CDI deals occurred in weaker submarkets in Lansing. This can be explained because some of Lansing's weaker submarkets are primarily weak housing areas, but also contain the state government offices and the supporting central business district in a relatively small spatial footprint. In other words, the areas surrounding some of Lansing's deal sites contained both lower-value housing and dense concentrations of high value commercial property.

Some of Lansing's low submarkets—weak housing areas—also contain the state government offices and the supporting central business district.

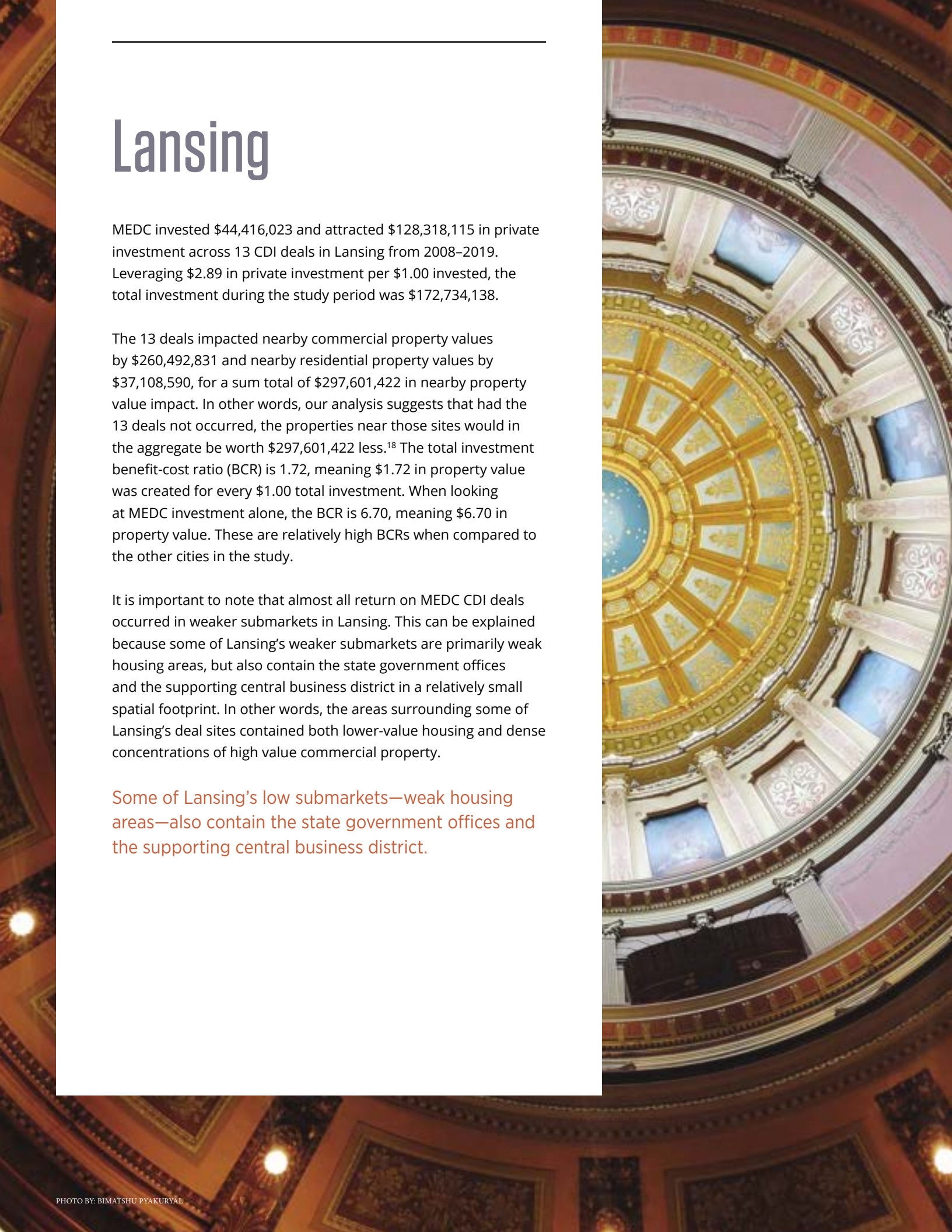
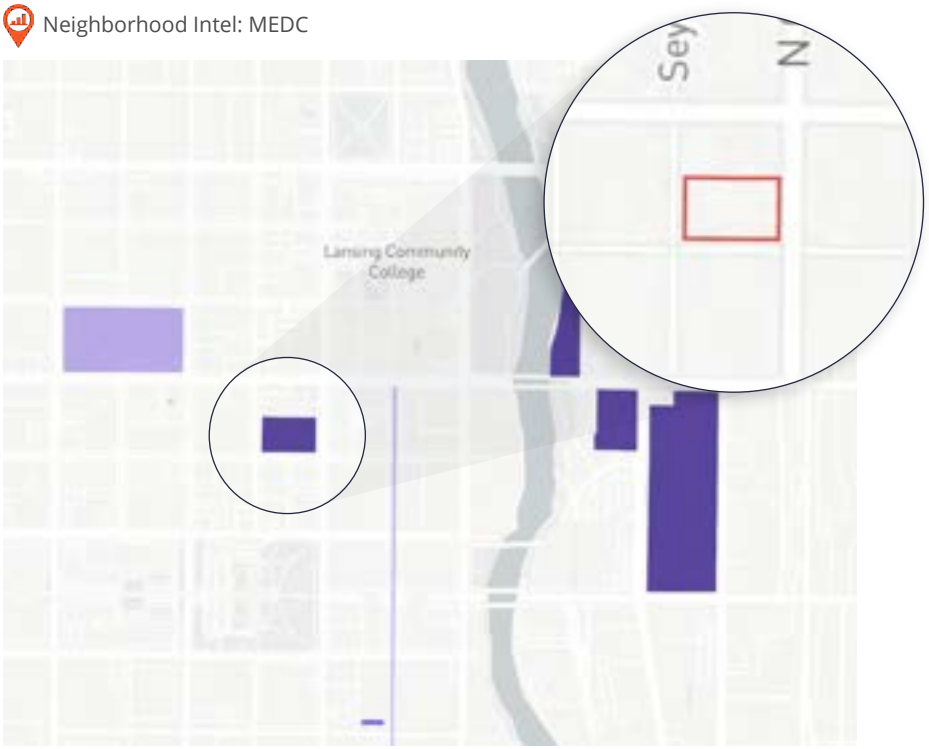


PHOTO BY: BIMATSHU PYAKURYAL

Neighborhood Intel: MEDC





310 N Seymour, Lansing

George F. Eyde Family, LLC-Oliver Towers Redevelopemnt (CRP/TIF)

TOTAL INVESTMENT
$17,066,506

MEDC INVESTMENT
$3,367,796

PRIVATE INVESTMENT
$13,698,710

COMBINED IMPACT
$93,665,492

COMMERCIAL IMPACT
$87,790,943

RESIDENTIAL IMPACT
$5,874,549

TOTAL PROPERTY VALUE IMPACT
$297,601,422

$260,492,831
COMMERICAL PROPERTY VALUE IMPACT

$37,108,590
TOTAL RESIDENTIAL PROPERTY VALUE IMPACT

MEDC INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER MEDC DOLLAR INVESTED

$1 = $6.70

Weak Submarket	$1 = $14.45	**$18,770,74**	MEDC INVESTMENT
Middle Submarket	$1 = $1.03	**$25,645,280**	MEDC INVESTMENT

TOTAL INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER TOTAL INVESTMENT DOLLAR INVESTED

$1 = $1.72

Weak Submarket	$1 = $4.55	**$59,615,317**	TOTAL INVESTMENT
Middle Submarket	$1 = $0.23	**$113,118,821**	TOTAL INVESTMENT

Property Value Impact of MEDC Community Development Incentives

LANSING

TABLE 16 provides key components calculated across all 13 deals in Lansing as well as an overview of total deal counts and investment levels split into real estate submarkets from our empirical analysis. This table provides a sense of the distribution of MEDC CDI deals and resources across varying types of real estate markets as well as the amount of private sector leveraged investment that was drawn into deals across those markets. It is important to note that no MEDC deals occurred in strong submarkets in Lansing.

TABLE 16: MEDC COMMUNITY DEVELOPMENT INCENTIVES (CDI) SIX CITY STUDY AREA INVESTMENT AND DEAL COUNT BY REAL ESTATE SUBMARKET, 2008–2019

Coverage	Deal Count	Total Investment	MEDC Investment	Private Investment	MEDC Leverage Ratio
Citywide	13	$172,734,138	$44,416,023	$128,318,115	2.89
Weak Submarket	11	$59,615,317	$18,770,743	$40,844,574	2.18
Middle Submarket	2	$113,118,821	$25,645,280	$87,473,541	3.41
Strong Submarket	—	—	—	—	—

TABLE 17 ***(See following page)*** provides aggregated commercial and residential property value impacts within 2,000 feet of MEDC investment sites as well as total investment and MEDC investment benefit-cost ratios (BCRs). BCRs can be used to estimate the overall impact of a total investment by quantifying new value creation for all nearby properties.

Table 17 also provides a summary of overall property value created for each dollar invested in total and across submarkets.

Findings suggest highest returns per dollar invested in weak submarkets.

Approximately half of the total investment was made in weak submarkets, and property value impact returns were approximately ten times higher than in the middle submarket. These results circle back to the unique circumstances of weaker housing markets in close proximity to the high value center point of Michigan's state government apparatus and its associated commercial district.

When looking at the total investment BCR, it is also important to point out that although less than $1.00 returned in new property value for each total dollar invested in the middle submarket, it is still all ancillary and positive external value creation that is in addition to the direct investment. In other words, the existence of positive externalities in the form of increased nearby property values have never been quantified as a result of economic development investment and are thus all in addition to any standard direct calculations of economic impact from economic development investment.

Property Value Impact of MEDC Community Development Incentives

LANSING

TABLE 17: BENEFIT-COST RATIOS (BCRS) FOR MEDC INVESTMENT DEALS AND TOTAL IMPACT WITHIN 2,000 FEET OF INVESTMENT SITES IN LANSING, MI, 2008–2019							
Coverage		Total Investment	MEDC Investment	Total Impact	Total Investment BCR	MEDC Investment	MEDC Investment as a Proportion of Deals
Citywide	**Total**	$172,734,138	$44,416,023	**$297,601,422**	**1.72**	**6.70**	25.71%
	Commercial			$260,492,831	1.51	5.86	
	Residential			$37,108,590	0.21	0.84	
Weak Submarket	**Total**	$59,615,317	$18,770,743	**$271,204,623**	**4.55**	**14.45**	31.49%
	Commercial			$244,199,409	4.1	13.01	
	Residential			$27,005,214	0.45	1.44	
Middle Submarket	**Total**	$113,118,821	$25,645,280	**$26,396,798**	**0.23**	**1.03**	22.67%
	Commercial			$16,293,422	0.14	0.64	
	Residential			$10,103,376	0.09	0.39	
Strong Submarket	**Total**	—	—	—	—	—	—
	—			—	—	—	
	—			—	—	—	

TABLE 18 dives deeper into property level value impacts by providing commercial and residential property value impact multipliers (PVIMs) citywide and across submarkets. The PVIMs derived from empirical hedonic analysis can be used to estimate the value of a given property one year or greater after an MEDC project breaks ground based on its current value and proximity to the MEDC investment site. For example, if a commercial property in a weak submarket is worth $1 million today, is within 2,000 feet of an MEDC investment site, and has a commercial PVIM of 1.38, then the property will be worth an estimated $1.38 million one year or greater after the investment takes place.

Table 18 also shows that the average count of commercial properties within 2,000 feet of MEDC investment sites in Lansing tends to be much lower than residential properties, which is logical given the average size of commercial properties tends to be larger than the average size of residential properties. Commercial PVIMs are consistently higher than residential PVIMs, thus suggesting that investment impact on nearby commercial properties has a great effect on a per unit basis.

TABLE 18:AVERAGE PROPERTY VALUE IMPACT MULTIPLIERS (PVIMS) FOR ALL COMMERCIAL & RESIDENTIAL PROPERTIES WITHIN 2,000 FEET OF MEDC INVESTMENT SITES IN LANSING, MI, 2008–2019								
	Average Commercial PVIM Stats				Average Residential PVIM Stats			
	Count of Commercial Properties	Value of Commercial Properties	Commercial PVIM	Percent Value Impact on Each Commercial Property	Count of Residential Properties	Value of Residential Properties	Residential PVIM	Percent Value Impact on Each Residential Property
Citywide	54	$1,344,675	1.38	27.67%	412	$87,171	1.09	7.95%
Weak Submarket	63	$1,292,152	1.38	27.47%	466	$81,160	1.07	6.50%
Middle Submarket	6	$4,356,022	1.45	31.17%	118	$218,199	1.25	19.70%
Strong Submarket	—	—	—	—	—	—	—	—

Marquette

MEDC invested $77,902,510 and attracted $207,675,018 in private investment across 8 CDI deals in Marquette from 2008–2019. Leveraging $2.67 in private investment per $1.00 invested, the total investment during the study period was $285,586,253. The 8 deals impacted nearby commercial property values by $45,853,349 and nearby residential property values by $38,210,912, for a sum total of $84,064,262 in nearby property value impact.

In other words, our analysis suggests that had the 13 deals not occurred, the properties near those sites would in the aggregate be worth $84,064,262 less.[19] The total investment benefit-cost ratio (BCR) is 0.29, meaning $0.29 in property value was created for every $1.00 of total investment. When looking at MEDC investment alone the BCR is 1.08, meaning $1.08 in property value was created for every $1.00 of MEDC investment.

These are the lowest BCRs in the study when compared to the other cities in the study. With 7 of the 8 deals in Marquette happening in the middle submarket and containing the overwhelming majority of the investment total, returns were weaker as compared to the single deal in the strong market that experienced a very high return. This suggests high commercial and residential value that was relatively dense with a low project cost for that single deal, while middle submarket deals suggest higher cost project(s) with lower density and values of surrounding properties. It is important to note that no MEDC deals occurred in weak submarkets in Marquette.

In the middle submarket—where 99% of MEDC Marquette investments occurred—commercial and residential BCRs were nearly equivalent. This suggests that unlike investment in other study cities, investment in Marquette had nearly the same impact on nearby commercial and residential properties.

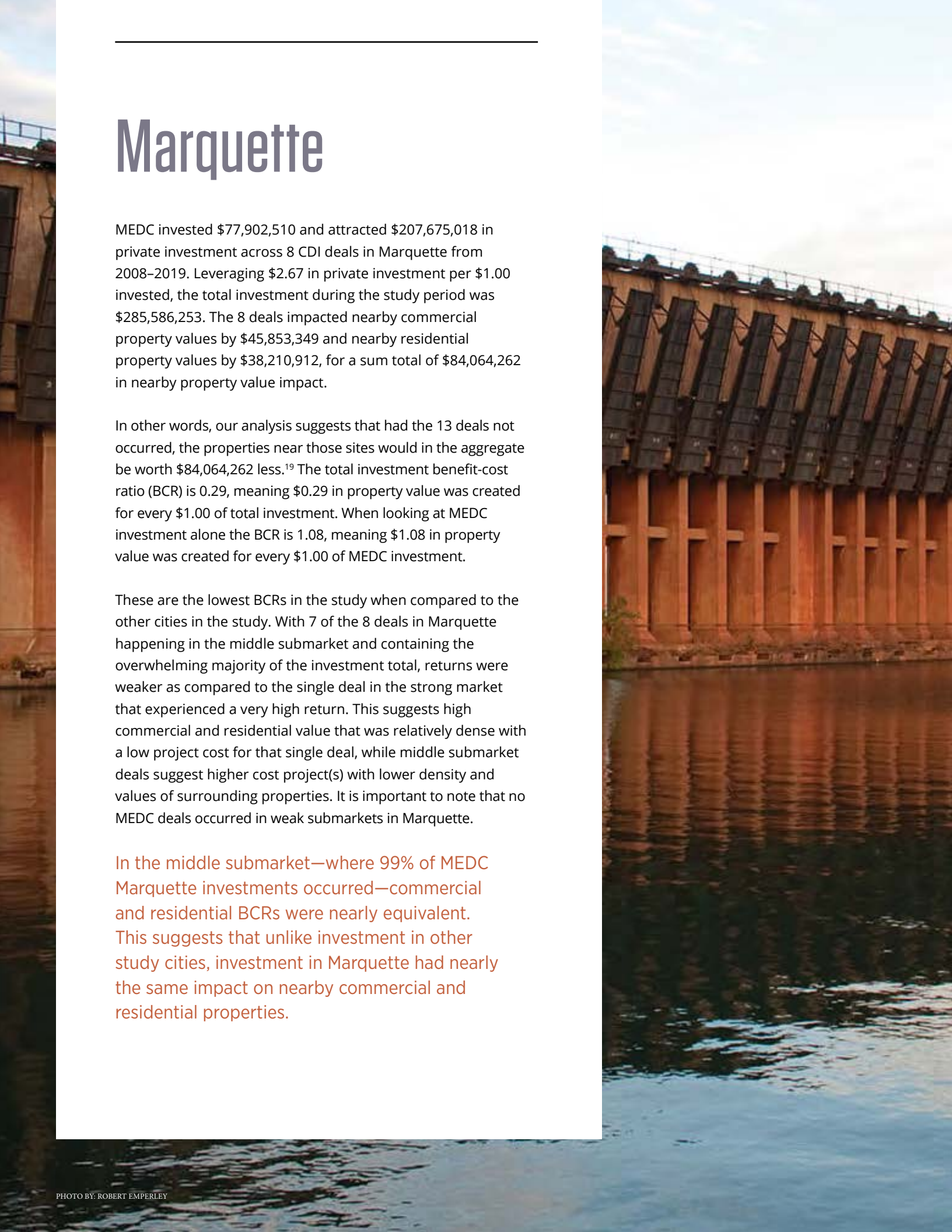
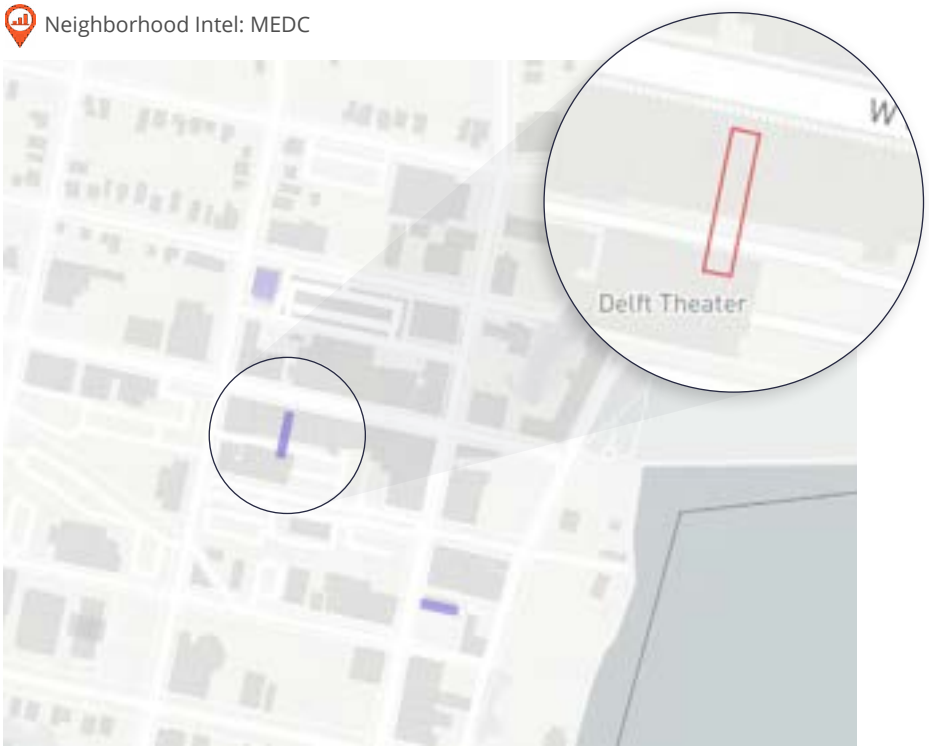


PHOTO BY: ROBERT EMPERLEY

Neighborhood Intel: MEDC





139 W Washington, Marquette

City of Marquette - The Delft Project (CDBG)

TOTAL INVESTMENT
$1,987,000

MEDC INVESTMENT
$481,000

PRIVATE INVESTMENT
$1,506,000

COMBINED IMPACT
$8,669,568

COMMERCIAL IMPACT
$6,818,194

RESIDENTIAL IMPACT
$1,851,374

TOTAL PROPERTY VALUE IMPACT
$84,064,26

$45,853,34
COMMERICAL PROPERTY VALUE IMPACT

$38,210,91
TOTAL RESIDENTIAL PROPERTY VALUE IMPACT

MEDC INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER MEDC DOLLAR INVESTED

$1 = $1.08

Middle Submarket $1 = $0.97 — **$77,673,760** MEDC INVESTMENT

Strong Submarket $1 = $38.78 — **$228,750** MEDC INVESTMENT

TOTAL INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER TOTAL INVESTMENT DOLLAR INVESTED

$1 = $0.29

Middle Submarket $1 = $0.26 — **$284,841,497** TOTAL INVESTMENT

Strong Submarket $1 = $11.91 — **$744,756** TOTAL INVESTMENT

Property Value Impact of MEDC Community Development Incentives

MARQUETTE

TABLE 19 provides key components calculated across all 8 deals made in Marquette as an overview of total deal counts and investment levels split into submarkets from our empirical analysis. This table also provides a sense of the distribution of MEDC CDI deals and resources across submarkets as well as the amount of private sector leveraged investment that was drawn into deals across submarkets. It is important to note that no MEDC deals occurred in weak submarkets in Marquette.

TABLE 19: MEDC COMMUNITY DEVELOPMENT INCENTIVES (CDI) INVESTMENT AND DEAL COUNT BY REAL ESTATE SUBMARKET IN MARQUETTE, MI, 2008–2019

Coverage	Deal Count	Total Investment	MEDC Investment	Private Investment	MEDC Leverage Ratio
Citywide	8	$285,586,253	$77,902,510	$207,675,018	2.67
Weak Submarket	—	—	—	—	—
Middle Submarket	7	$284,841,497	$77,673,760	$207,159,012	2.67
Strong Submarket	1	$744,756	$228,750	$516,006	2.26

TABLE 20 ***(See following page)*** provides aggregated Marquette commercial and residential property value impacts within 2,000 feet of MEDC investment sites, as well as total investment and MEDC investment benefit-cost ratios (BCRs). BCRs can be used to estimate the overall impact of a total investment by quantifying new value creation for all nearby properties.

Table 20 also provides a summary overview of overall property value created for each dollar invested in total and across submarkets.

Findings overwhelmingly suggest higher returns per dollar invested in the strong submarket.

However, this assessment is hard to lean on too heavily given the single observation and potential outlier characteristics of that deal. This makes it hard to tell if it was simply a good deal—high density and high value properties near a low investment requirement—thereby creating high impact with low project cost. It is clear, however, that a large investment was made in the middle submarket, and the density and value of nearby commercial and residential properties was relatively low when compared to project costs. That said, when looking at the total investment BCR, it is also important to point out that although less than $1.00 returned in new property value for each total dollar invested in the middle submarket, it is still all ancillary and positive external value creation that is in addition to the direct investment. In other words, the existence of positive externalities in the form of increased nearby property values have never been quantified as a result of economic development investment and are thus all in addition to any standard direct calculations of economic impact from economic development investment.

Property Value Impact of MEDC Community Development Incentives

MARQUETTE

TABLE 20: BENEFIT-COST RATIOS (BCRS) FOR MEDC INVESTMENT DEALS AND TOTAL IMPACT WITHIN 2,000 FEET OF INVESTMENT SITES IN MARQUETTE, MI, 2008–2019							
Coverage		Total Investment	MEDC Investment	Total Impact	Total Investment BCR	MEDC Investment BCR	MEDC Investment as a Proportion of Deals
Citywide	**Total**	$285,586,253	$77,902,510	**$84,064,262**	**0.29**	**1.08**	27.28%
	Commercial			$45,853,349	0.16	0.59	
	Residential			$38,210,912	0.13	0.49	
Weak Submarket	**Total**	—	—	—	—	—	—
	Commercial			—	—	—	
	Residential			—	—	—	
Middle Submarket	**Total**	$284,841,497	$77,673,760	**$75,192,721**	**0.26**	**0.97**	27.27%
	Commercial			$38,890,712	0.14	0.50	
	Residential			$36,302,009	0.13	0.47	
Strong Submarket	**Total**	$744,756	$228,750	**$8,871,541**	**11.91**	**38.78**	30.71%
	Commercial			$6,962,637	9.35	30.44	
	Residential			$1,908,904	2.56	8.34	

TABLE 21 dives deeper into property level impacts by providing commercial and residential property value impact multipliers (PVIMs) citywide across submarkets. The PVIMs derived from empirical hedonic analysis can be used to estimate the value of a given property one year or greater after an MEDC project breaks ground based on its current value and proximity to the MEDC investment site. For example, if a commercial property in a strong submarket is worth $1 million today, is within 2,000 feet of an MEDC investment site, and has a commercial PVIM of 1.35, then the property will be worth an estimated $1.35 million one year or greater after the investment.

Table 21 also shows that the average count of commercial properties within 2,000 feet of MEDC investment sites in Marquette tends to be much lower than residential properties, which is logical given the average size of commercial properties tends to be larger than the average size of residential properties. Commercial PVIMs are consistently higher than residential PVIMs, thus suggesting that investment impact on nearby commercial properties has a great effect on a per unit basis.

TABLE 21: AVERAGE PROPERTY VALUE IMPACT MULTIPLIERS (PVIMS) FOR ALL COMMERCIAL & RESIDENTIAL PROPERTIES WITHIN 2,000 FEET OF MEDC INVESTMENT SITES IN MARQUETTE, MI, 2008–2019								
	Average Commercial PVIM Stats				Average Residential PVIM Stats			
	Count of Commercial Properties	Value of Commercial Properties	Commercial PVIM	Percent Value Impact on Each Commercial Property	Count of Residential Properties	Value of Residential Properties	Residential PVIM	Percent Value Impact on Each Residential Property
Citywide	27	$757,285	1.38	27.65%	254	$176,529	1.12	10.65%
Weak Submarket	—	—	—	—	—	—	—	—
Middle Submarket	24	$817,649	1.39	27.98%	247	$171,236	1.14	12.28%
Strong Submarket	49	$547,856	1.35	25.94%	305	$206,500	1.03	3.03%

Adrian

MEDC invested $5,260,135 and attracted $2,805,274 in private investment across 6 deals in Adrian from 2008–2019. Leveraging $0.53 in private investment per $1.00 invested, the total investment during the study period was $8,065,409. The 6 deals impacted nearby commercial property values by $9,493,800 and nearby residential property values by $4,473,369, for a sum total of $13,967,169 in nearby property value impact. In other words, our analysis suggests that had the 6 deals not occurred, the properties near those sites would in the aggregate be worth $13,967,169 less.[20] The total investment benefit-cost ratio (BCR) is 1.73, meaning $1.73 in property value was created for every $1.00 of total investment.

When looking at MEDC investment alone the BCR is 2.66, meaning $2.66 in property value was created for every $1.00 of MEDC investment. This strongly indicates that opportunity exists in growing small city economies even without large amounts of private sector investment leverage. Table 22 shows that Adrian was the only city in our study where MEDC invested more than the private sector, yet BCRs are quite strong.

Most of Adrian falls into the low submarket, and all MEDC CDI deals were made in the low submarket, perhaps making it more difficult to attract private sector investment.

The relatively low return on investment in Adrian can be explained by the city's overall low property values and rental rate.



PHOTO BY: BENNY MAZUR

Neighborhood Intel: MEDC





101 E Maumee St, Adrian

City of Adrian - Strongback Blight Elimination/Housing (CDBG/TIF)

TOTAL INVESTMENT
$4,879,134

MEDC INVESTMENT
$3,258,821

PRIVATE INVESTMENT
$1,620,313

COMBINED IMPACT
$8,012,578

COMMERCIAL IMPACT
$5,647,959

RESIDENTIAL IMPACT
$2,364,959

TOTAL PROPERTY VALUE IMPACT
$13,967,169

$9,493,800
COMMERICAL PROPERTY VALUE IMPACT

$4,473,369
TOTAL RESIDENTIAL PROPERTY VALUE IMPACT

MEDC INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER MEDC DOLLAR INVESTED

$1 = $2.66

Weak Submarket

$1 = $2.66

$5,260,135
MEDC INVESTMENT

TOTAL INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER TOTAL INVESTMENT DOLLAR INVESTED

$1 = $1.73

Weak Submarket

$1 = $1.73

$8,065,409
TOTAL INVESTMENT

Property Value Impact of MEDC Community Development Incentives

ADRIAN

TABLE 22 provides key components calculated across all 6 deals made in Adrian, as well as overview of total deal counts and investment levels split in the weak submarket from our empirical analysis. This table also provides MEDC CDI deals and resources in that submarket as well as the amount of private sector leveraged investment that was drawn in. It is important to note that zero deals occurred in the middle or strong submarkets in Adrian.

TABLE 22: MEDC COMMUNITY DEVELOPMENT INCENTIVES (CDI) INVESTMENT AND DEAL COUNT BY REAL ESTATE SUBMARKET IN ADRIAN, MI, 2008–2019

Coverage	Deal Count	Total Investment	MEDC Investment	Private Investment	MEDC Leverage Ratio
Citywide	6	$8,065,409	$5,260,135	$2,805,274	0.53
Weak Submarket	6	$8,065,409	$5,260,135	$2,805,274	0.53
Middle Submarket	—	—	—	—	—
Strong Submarket	—	—	—	—	—

TABLE 23 ***(See following page)*** provides aggregated Adrian commercial and residential property value impacts within 2,000 feet of MEDC investment sites, as well as total investment and MEDC investment benefit-cost ratios (BCRs). BCRs can be used to estimate the overall impact of a total investment by quantifying new value creation for all nearby properties.

Table 23 also provides a summary of overall property value impact created for each dollar invested citywide and in the weak submarket.

The total investment BCR citywide in Adrian is the highest amongst small cities and the second highest observed in the study. Despite evidence of lower leverage ratios in small cities, findings in Adrian suggest that public sector investment creates meaningful impacts in small cities.

Property Value Impact of MEDC Community Development Incentives

ADRIAN

TABLE 23: BENEFIT-COST RATIOS (BCRS) FOR MEDC INVESTMENT DEALS AND TOTAL IMPACT WITHIN 2,000 FEET OF INVESTMENT SITES IN ADRIAN, MI, 2008–2019							
Coverage		Total Investment	MEDC Investment	Total Impact	Total Investment BCR	MEDC Investment BCR	MEDC Investment as a Proportion of Deals
Citywide	**Total**	$8,065,409	$5,260,135	**$13,967,169**	**1.73**	**2.66**	65.22%
	Commercial			$9,493,800	1.18	1.80	
	Residential			$4,473,369	0.55	0.85	
Weak Submarket	**Total**	$8,065,409	$5,260,135	**$13,967,169**	**1.73**	**2.66**	65.22%
	Commercial			$9,493,800	1.18	1.80	
	Residential			$4,473,369	0.55	0.85	
Middle Submarket	**Total**	—	—	—	—	—	—
	Commercial			—	—	—	
	Residential			—	—	—	
Strong Submarket	**Total**	—	—	—	—	—	—
	Commercial			—	—	—	
	Residential			—	—	—	

TABLE 24 dives deeper into property level impacts by providing commercial and residential property value impact multipliers (PVIMs) citywide and in the weak submarket. The PVIMs derived from empirical hedonic analysis can be used to estimate the value of a given property within 2,000 feet of an investment one year or greater after an MEDC project breaks ground based on its current value. For example, if a commercial property in a weak submarket is worth $1 million today, is within 2,000 feet of an MEDC investment site, and has a commercial PVIM of 1.35, then the property will be worth an estimated $1.35 million one year or greater after the investment.

Table 24 also shows that the average count of commercial properties within 2,000 feet of MEDC investment sites in Adrian tends to be much lower than residential properties, which is logical given the average size of commercial properties tends to be larger than the average size of residential properties. Commercial PVIMs are consistently higher than residential PVIMs, thus suggesting that investment impact on nearby commercial properties has a great effect on a per unit basis.

TABLE 24: AVERAGE PROPERTY VALUE IMPACT MULTIPLIERS (PVIMS) FOR ALL COMMERCIAL & RESIDENTIAL PROPERTIES WITHIN 2,000 FEET OF MEDC INVESTMENT SITES IN ADRIAN, MI, 2008–2019								
	Average Commercial PVIM Stats				Average Residential PVIM Stats			
	Count of Commercial Properties	Value of Commercial Properties	Commercial PVIM	Percent Value Impact on Each Commercial Property	Count of Residential Properties	Value of Residential Properties	Residential PVIM	Percent Value Impact on Each Residential Property
Citywide	31	$196,188	1.35	25.74%	142.5	$73,733	1.08	7.10%
Weak Submarket	31	$196,188	1.35	25.74%	142.5	$73,733	1.08	7.10%
Middle Submarket	—	—	—	—	—	—	—	—
Strong Submarket	—	—	—	—	—	—	—	—

Alpena

MEDC deals invested $2,423,591 and attracted $9,711,248 in private investment across seven CDI deals in Alpena from 2008–2019. Leveraging $3.99 in private investment per $1.00 invested, the total investment during the study period was $12,150,119. The 7 deals impacted nearby commercial property values by $9,805,446 and nearby residential property values by $3,614,673, for a sum total of $13,420,119 in nearby property value impact. In other words, our analysis suggests that had the 7 deals not occurred, the properties near those sites would in the aggregate be worth $13,420,119 less.[21] The total investment benefit-cost ratio (BCR) is 1.10, meaning $1.10 in property value was created for every $1.00 of total investment. When looking at MEDC investment alone the BCR is 5.52, meaning $5.52 in property value was created for every $1.00 of MEDC investment, These BCRs are very encouraging for property value impact available as a result of small city investments.

The City of Alpena falls into the low submarket as a result of low population density, thus variations in incomes and property values cannot be detected. Zero MEDC deals occurred in the middle or strong submarkets in Alpena. MEDC CDI deals in Alpena were clustered in the central business district and away from residential density, thus yielding a higher commercial property value impact return.

This approach somewhat resembles the approach in Detroit during the study period - concentrating investment in central business districts not near residential density.

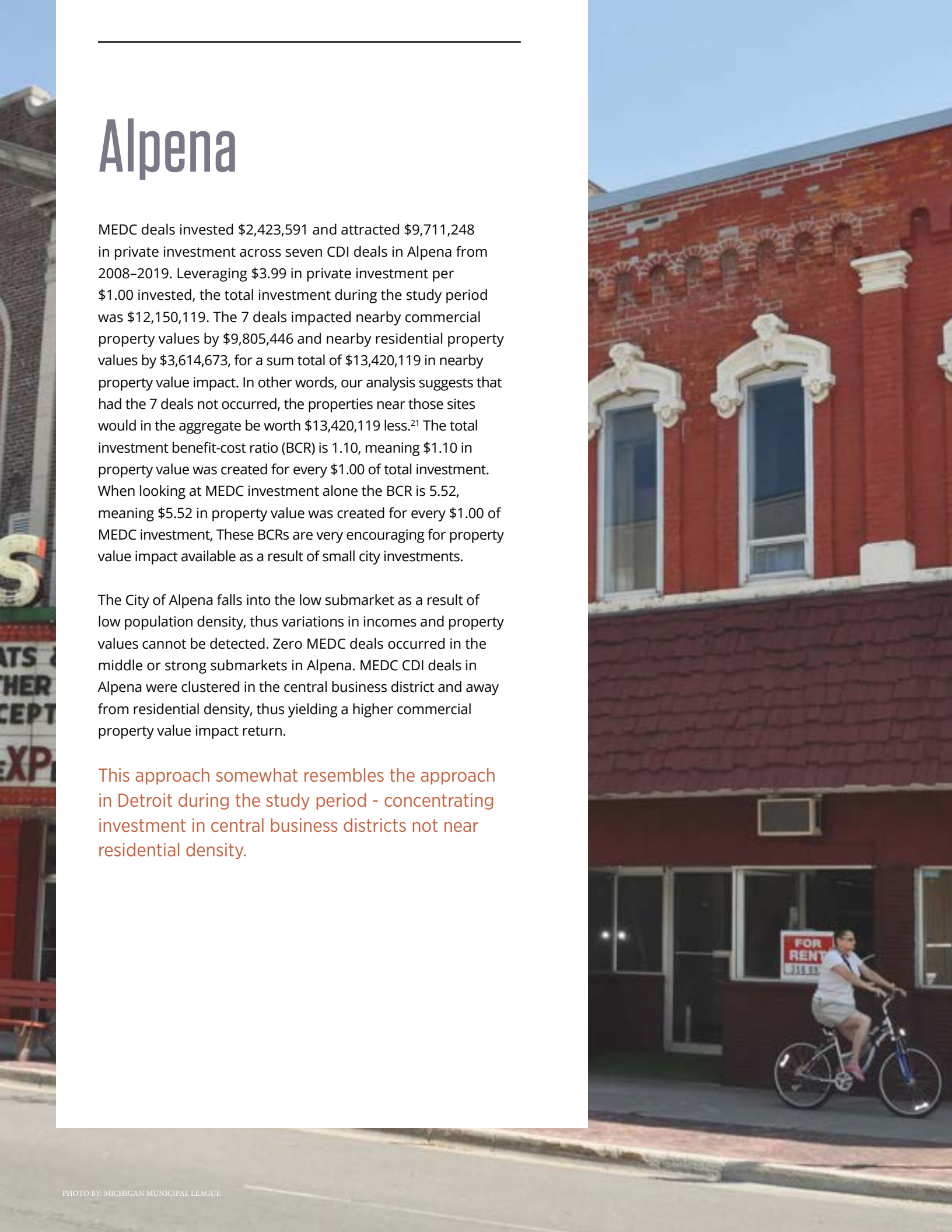


PHOTO BY: MICHIGAN MUNICIPAL LEAGUE

Neighborhood Intel: MEDC





325 N. Second Avenue, Alpena

City of Alpena-Downtown Facade Improvement (CDBG - AB) 2015

TOTAL INVESTMENT
$2,016,511

MEDC INVESTMENT
$972,951

PRIVATE INVESTMENT
$1,043,560

COMBINED IMPACT
$1,875,489

COMMERCIAL IMPACT
$1,283,367

RESIDENTIAL IMPACT
$592,122

TOTAL PROPERTY VALUE IMPACT
$13,420,119

$9,805,446
COMMERICAL PROPERTY VALUE IMPACT

$3,614,673
TOTAL RESIDENTIAL PROPERTY VALUE IMPACT

MEDC INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER MEDC DOLLAR INVESTED

$1 = $5.52

Weak Submarket

$1 = $5.52

$2,432,591
MEDC INVESTMENT

TOTAL INVESTMENT BENEFIT-COST RATIO

AVERAGE INCREASE IN PROPERTY VALUE PER TOTAL INVESTMENT DOLLAR INVESTED

$1 = $1.10

Weak Submarket

$1 = $1.10

$12,150,119
TOTAL INVESTMENT

Property Value Impact of MEDC Community Development Incentives

ALPENA

TABLE 25 provides key components calculated across all 7 deals in Alpena, as well as an overview of total deal counts and investment levels in the weak real estate submarket from our empirical analysis in Alpena. This table also provides a sense of the distribution of MEDC CDI deals and resources in that real estate market as well as the amount of private sector leveraged investment that was drawn into deals across that market. It is important to note that zero MEDC deals occurred in the middle or strong submarkets in Alpena.

TABLE 25: MEDC COMMUNITY DEVELOPMENT INCENTIVES (CDI) INVESTMENT AND DEAL COUNT BY REAL ESTATE SUBMARKET IN ALPENA, MI, 2008–2019

Coverage	Deal Count	Total Investment	MEDC Investment	Private Investment	MEDC Leverage Ratio
Citywide	7	$12,150,119	$2,432,591	$9,711,248	3.99
Weak Submarket	7	$12,150,119	$2,432,591	$9,711,248	3.99
Middle Submarket	—	—	—	—	—
Strong Submarket	—	—	—	—	—

TABLE 26 ***(See following page)*** provides aggregated commercial and residential property value impacts within 2,000 feet of MEDC investment sites, as well as total investment and MEDC investment benefit-cost ratios (BCRs). BCRs can be used to estimate the overall impact of a total investment by quantifying new value creation for all nearby properties.

Table 26 also provides a summary of overall property value impact created for each dollar invested in total across the weak submarket.

Given the healthy investment BCRs in Alpena, findings suggest that public sector investment creates meaningful impacts in small cities.

Property Value Impact of MEDC Community Development Incentives

ALPENA

TABLE 26: BENEFIT-COST RATIOS (BCRS) FOR MEDC INVESTMENT DEALS AND TOTAL IMPACT WITHIN 2,000 FEET OF INVESTMENT SITES IN ALPENA, MI, 2008–2019							
Coverage		Total Investment	MEDC Investment	Total Impact	Total Investment BCR	MEDC Investment BCR	MEDC Investment as a Proportion of Deals
Citywide	**Total**	$12,150,119	$2,432,591	**$13,420,119**	**1.1**	**5.52**	20.02%
	Commercial			$9,805,446	0.81	4.03	
	Residential			$3,614,673	0.3	1.49	
Weak Submarket	**Total**	$12,150,119	$2,432,591	**$13,420,119**	**1.1**	**5.52**	20.02%
	Commercial			$9,805,446	0.81	4.03	
	Residential			$3,614,673	0.3	1.49	
Middle Submarket	**Total**	—	—	—	—	—	—
	Commercial			—	—	—	
	Residential			—	—	—	
Strong Submarket	**Total**	—	—	—	—	—	—
	Commercial			—	—	—	
	Residential			—	—	—	

TABLE 27 dives deeper into property level impacts by providing the commercial and residential property value impact multipliers (PVIMs) citywide and in the weak submarket. The PVIMs derived from empirical hedonic analysis can be used to estimate the value of a given property within 2,000 feet of an investment one year or more after an MEDC project breaks ground based on its current value. For example, if a commercial property in a weak submarket is worth $1 million today, is within 2,000 feet of an MEDC investment site, and has a commercial PVIM of 1.26, then the property will be worth an estimated $1.26 million one year or greater after the investment.

Table 27 also shows that the average count of commercial properties within 2,000 feet of MEDC investment sites in Alpena tends to be much lower than residential properties, which is logical given the average size of commercial properties tends to be larger than the average size of residential properties. Commercial PVIMs are consistently higher than residential PVIMs, thus suggesting that investment impact on nearby commercial properties has a great effect on a per unit basis.

TABLE 27: PROPERTY VALUE IMPACT MULTIPLIERS (PVIMS) FOR ALL COMMERCIAL & RESIDENTIAL PROPERTIES WITHIN 2,000 FEET OF MEDC INVESTMENT SITES IN ALPENA, MI, 2008–2019								
	Commercial PVIM Stats				Residential PVIM Stats			
	Count of Commercial Properties	Value of Commercial Properties	Commercial PVIM	Percent Value Impact on Each Commercial Property	Count of Residential Properties	Value of Residential Properties	Residential PVIM	Percent Value Impact on Each Residential Property
Citywide	24	$289,131	1.26	20.55%	96	$73,319	1.08	7.34%
Weak Submarket	24	$289,131	1.26	20.55%	96	$73,319	1.08	7.34%
Middle Submarket	—	—	—	—	—	—	—	—
Strong Submarket	—	—	—	—	—	—	—	—

Statewide Impacts

OVERALL LEVERAGE RATIO OF MEDC COMMUNITY DEVELOPMENT INCENTIVES

MEDC invested $1,095,834,599 statewide in 542 deals from 2008–2019. This investment facilitated $4,256,362,197 in private investment, yielding the overall MEDC investment leverage ratio of $3.88 of private investment for every $1.00 of MEDC investment during the study period.

OVERALL RESIDENTIAL PROPERTY VALUE IMPACT

The 542 deals observed during the study period impacted nearby residential property values by $1,182,816,385. In other words, had the 542 deals not occurred, residential property values in the aggregate in Michigan would be $1,182,816,385[22] less.

OVERALL COMMERCIAL PROPERTY VALUE IMPACT

We were not able to measure commercial impacts of deals situated outside of the six cities because we did not have access to commercial property values outside the six cities. This study therefore cannot estimate in a scientifically defensible manner the nearby commercial property impacts of 366 of the 542 deals. Because we cannot estimate commercial property impacts statewide, we also cannot offer either overall statewide property value impacts, benefit-cost ratios (BCRs), or property value impact multipliers (PVIMs) for MEDC CDI deals.

That said, the empirical analysis allows us to learn about the relationship between commercial and residential property value impacts. Residential property value impact findings were consistent in the six cities and statewide. In the six cities the commercial property value impact of $3,205,555,894 amounted to 83% of overall property value impact. The residential property impact of $659,230,511 was 17% of overall property value impact. This means that in the six city study area, $4.86 in commercial property value was created for every $1.00 in residential property value created from MEDC deals. While we cannot state with scientific authority that this relationship will hold, it helps provide a sense of expected commercial property value impacts outside the six cities.

Given the data constraints of this study, Dynamo can say nothing further on the question of overall statewide nearby property value impacts. But for decision support purposes, MEDC is free to draw the reasonable, though not provable within this study, inference that the overall relative percentages of impacts in the six cities—17% residential to 83% commercial—might approximately mirror the overall relative impact percentages throughout Michigan's urbanized areas.

Applying Benefit-cost Ratios and Property Value Impact Multipliers

The two primary property value impact result statistics derived from the empirical analysis in this study—benefit-cost ratios (BCRs) and property value impact multipliers (PVIMs)—are useful in evaluating the outcome of MEDC activity on the nearby property value as a result of investment choices from the past. BCR statistics are defined as the ratios of total residential and commercial property value impact within 2,000 feet of an MEDC CDI investment site (the benefit) one year and greater after project start date divided by the total MEDC and MEDC plus private investment made in a given deal (the cost). The PVIMs are defined as the property value impact multipliers that can be applied to any current individual commercial or residential property value that falls within the relevant radius of an investment location at least one year or greater after that project broke ground. The commercial and residential PVIMs originate from different models in the empirical analysis and thus are different for each investment. The residential and commercial PVIMs are the root of all property value impact estimation from the empirical analysis.

We are terming the BCR and PVIM statistics as the property-value focused placemaking effects of MEDC CDI Programs evaluated in this study. They were used to quantify the property value impacts of the 542 deals over the study time period, and they are extremely useful in analyzing, predicting, and targeting future investment decisions going forward. These statistics are built into the statewide evaluative and predictive layers of the Neighborhood Intel™ Decision Support Software. The impact outcomes of applying these statistics vary greatly based on investment size as well as commercial and residential density, property values, and overall market health surrounding the investment sites. These two statistics are useful in different ways for evaluating and targeting strategic decision making related to future investment choices.

Benefit-cost Ratios

When considering BCRs quantified in this study to evaluate a past investment or consider a new investment, the impact analyst gets a very quick sense of the total amount of potential new commercial and residential property value that has or will be spread to all nearby properties as a result of a total investment. In other words, if a BCR is greater than zero, new property value is created and distributed to nearby properties. The impacts we are measuring are in addition to the direct benefits of an economic development that occur at the site itself.[23]

With these BCRs, MEDC can now strategically consider the total cost of a prospective deal, the amount of public funding that can or is budgeted to go into the deal, and the amount of private sector investment it needs to attract to make the deal worth it before making its commitment. It is key to point out that total investment BCRs and MEDC investment BCRs are fundamentally different. Total investment BCRs are a more direct measure for predictive analysis given that impact is calculated based on the total investment amount.

Property Value Impact Multipliers

While BCRs are best leveraged from a strategic standpoint to get a broad sense of total expected property value impact on nearby properties, the PVIMs are better equipped to strategically understand the expected impact on a given individual property based on its current value. The PVIMs allow the impact analyst the ability to quantify a given commercial or residential property's future value as a result of an investment. The PVIMs are dynamically responsive to the investment size, the property submarket the investment falls in, and the proximity of the commercial or residential buildings of interest to the investment site. Deeper investigations of the mechanics of the PVIMs are warranted because they are at the core of the hedonic model[k] outputs of this study that allow quantification of MEDC CDI investment impacts.

Using Benefit-cost Ratios and Property Value Impact Multipliers

Residential Property Value Impact Multipliers

All properties in a community may in some sense benefit from a redevelopment project completed somewhere, but it is scientifically difficult to measure the impact everywhere. It is possible, however, to measure the impacts of CDI investments near MEDC deal sites. Dynamo employed a benefits transfer method[i] to apply its finding in the six cities statewide. This allows MEDC to predict the impact of future CDI investments throughout Michigan.

TABLE 28 shows the impact of deals on surrounding residential property values within 2,000 feet of the investment site—a radius roughly six football fields long. The 2,000-foot impact radius is divided into four bands, starting from the area closest to the investment site and moving outward. Investments likely have impacts on property values further than 2,000 feet away, but these impacts become difficult to measure. Nevertheless, MEDC can use this table to predict nearby residential property value impacts of future deals.

TABLE 28: MEDC COMMUNITY DEVELOPMENT INCENTIVES (CDI) RESIDENTIAL PROPERTY VALUE IMPACT MULTIPLIERS (PVIMS)

		Distance From Investment Site			
	Deal Size ($)	0–500 ft.	501–1,000 ft.	1,001–1,500 ft.	1,501–2,000 ft.
Weak Submarkets	$500,000	1.14	1.07	1.07	1.07
	$5,000,000	1.17	1.08	1.08	1.08
	$20,000,000	1.18	1.09	1.09	1.09
	$100,000,000	1.2	1.09	1.09	1.09
	$150,000,000	1.21	1.1	1.1	1.1
Middle Submarkets	$500,000	1.21	1.21	1.14	1.14
	$5,000,000	1.25	1.25	1.16	1.16
	$20,000,000	1.27	1.27	1.18	1.18
	$100,000,000	1.3	1.3	1.19	1.19
	$150,000,000	1.31	1.31	1.2	1.2
Strong Submarkets	$500,000	1.35	1	1	1
	$5,000,000	1.43	1	1	1
	$20,000,000	1.47	1	1	1
	$100,000,000	1.53	1	1	1
	$150,000,000	1.54	1	1	1

For example, if you make a $100 million dollar investment in a weak submarket, then each residential property within 500 feet of the investment will increase by 20% given the PVIM of 1.2. This means that a residential property worth $100,000 when the MEDC project began will be worth $120,000 one year and greater after the project breaks ground.

Commercial Property Value Impact Multipliers

MEDC can now also predict the impacts of its investments on nearby commercial property values.

TABLE 29 shows the predicted impact of deals on surrounding commercial property values within 2,000 feet of the investment site. The 2,000-foot impact radius is divided into two bands—the area immediately surrounding the investment site and an area further away. The commercial impact table below is less complex (fewer distance bands, no submarkets) because commercial sales occur far less frequently than residential sales, and the observational model requires more consolidated intuition. Like with residential impact, investments likely have an impact on commercial property values further than 2,000 feet away, but these impacts become difficult to measure. MEDC can use this table to predict the nearby commercial property value impacts of MEDC investments.

TABLE 29: MEDC COMMUNITY DEVELOPMENT INCENTIVES (CDI) COMMERCIAL PROPERTY VALUE IMPACT MULTIPLIERS (PVIMS)			
	Investment Levels	0-1,000 ft.	1,001-2,000 ft.
All Submarkets	$500,000	1.32	1.15
	$5,000,000	1.39	1.17
	$20,000,000	1.43	1.19
	$100,000,000	1.48	1.21
	$150,000,000	1.5	1.22

For example, if you make a $100 million dollar investment, then each commercial property within 1000 feet of the investment will increase by 48% given the PVIM of 1.48. This means that a commercial property worth $100,000 when the MEDC project began will be worth $148,000 one year and greater after the project breaks ground.

Occupancy Rate Impact of MEDC Community Development Incentives

An in-depth empirical analysis of the impacts of MEDC Community Development Incentives (CDI) deals on nearby commercial and residential occupancy rates was also performed in this study. Results showed that both commercial and residential occupancy rates within 1,000 feet of MEDC CDI investment areas increased by roughly 3% more than those areas that did not receive an MEDC CDI investment within 1,000 feet during the study time period. While this analysis utilized a less econometrically robust method, difference-in-differences (DID)[24], to quantify this occupancy-rate placemaking effect, it still makes clear that there is a statistically significant expectation that when MEDC invests in CDI Programs in a given location, it can expect to see both commercial and residential occupancy rates increase in the nearby area by roughly 3% each.

INVESTMENT IMPACT ON NEARBY RESIDENTIAL AND COMMERCIAL OCCUPANCY RATES

Density of people and businesses is another measure of health for Michigan communities. As such, we measured the impacts of deals on nearby occupancy rates.

TABLE 30 shows the impact of deals on occupancy rates within 1,000 feet of the investment site (a radius approximately three football fields long), but not including the site itself. This was calculated by comparing residential and commercial occupancy rates near MEDC investment at the beginning and end of the study period to residential and commercial occupancy rates not near MEDC investment at the beginning and end of the study period.

TABLE 30: IMPACT ON OCCUPANCY RATES WITHIN 1,000 FEET OF MEDC COMMUNITY DEVELOPMENT INCENTIVES (CDI) DEALS, 2011–2017

Real Estate Zone	Residential	Commercial
Six-city Wide	2.90%	3.22%
Weak Submarket	2.63%	—
Middle Submarket	2.34%	—
High Submarket	—	—

MEDC can use this table to predict that CDI deals will increase residential and commercial occupancy rates by roughly 3% within a 1,000-foot radius of the investment site. Thus, understanding existing occupancy rates at the time of investment will be key to understanding the dynamic outcome of this placemaking effect.

Occupancy Rate Impact of MEDC Community Development Incentives

DIRECT IMPACT ON OCCUPANCY RATES AT MEDC INVESTMENT SITES

We also measured the occupancy rates of the investment sites themselves.

TABLE 31 below shows the pre- and post-rehabilitation occupancy for the 106 deals involving existing structures that received investment during the study period.

TABLE 31: DIRECT OCCUPANCY RATE IMPACT ON MEDC COMMUNITY DEVELOPMENT INCENTIVES EXISTING STRUCTURE TARGETS, 2011–2017

	Total Buildings Recieving Direct MEDC Deal Investment	Occupied Units	Vacant Units	Occupancy Rate
Q1 2011	106	190	67	73.93%
Q4 2017	106	357	92	79.51%
Change During Program Period	—	167	25	5.58%

MEDC CDI rehabilitations not only created more units, but also increased overall unit occupancy rates by 5.58% in the buildings at the sites they directly invested in. This suggests that not only do the building sites themselves increase in occupancy as a result of MEDC CDI investments, but also impact nearby occupancy rates. Additionally, and not reflected in the table above, MEDC CDI new construction deals achieved an occupancy rate of 97.48% by the end of study period.[25]



Further Insights, Recommendations, and Limitations

Further Insights, Recommendations, and Limitations

MEASURING THE IMPACTS OF PLACEMAKING

Placemaking has its origins in the research of Jane Jacobs and W.H. White, whose writings nearly two generations ago focused on the importance of lively neighborhoods and active street life. Placemaking can be defined as the "development or redevelopment of value-added real estate that integrates essential elements of local and regional allure (e.g., mixed use, walkability, green spaces, energy efficiency) to generate an improved quality of life, a higher economic impact for the community, enhanced property tax revenue and better return to the developer and investors, while minimizing negative environmental and social impacts" (Adelaja, 2008b).

In the 1990's, as Michigan's economy began to diversify and become more knowledge based, it became clear that many entrepreneurs and workers in the emergent knowledge-based economy preferred the same settings that Jacobs and White championed: lively, walkable spaces inviting social and cultural well being and the intermingling of work, life, and leisure.[m]

This trend led to the Cool Cities Initiative launched in 2003 and the Sense of Place Council's formation in 2007[n], where various public-sector stakeholders could "collectively work . . . to promote policies and practices that make Michigan more vibrant and competitive in the 21st century economy" (Michigan Municipal League, 2017).

The following year, the Michigan State University Land Policy Institute began testing the results of early placemaking efforts in Michigan and elsewhere. These studies provided a theoretical framework and early evidence that placemaking works to increase vitality and attract knowledge-economy occupancy and investment (Adelaja, 2008b). Subsequent placemaking studies have further refined theory and practice and have provided case studies suggesting the effectiveness of placemaking and catalytic investment.[26] Some of these studies, however, have been based largely upon qualitative surveys. Others have been strictly correlative, meaning the studies show that conditions improve after investment occurs, but cannot demonstrate that the investments caused the improvements. While surveys and correlative studies are useful in generally affirming the efficacy of placemaking, they cannot measure results.

Without the ability to measure results, public sector investors cannot understand the magnitude of investment impact. Nor can public sector investors predict the impact of various investments.

To take an example, let's suppose MEDC has 50 CDI investment proposals under consideration, but can only fund 20. Under the placemaking research to date, and without Regional Economic Models, Inc. Public Investment (REMI PI+) modeling resources available for all 50 proposals, MEDC does not have the ability to rank the proposed investments from most impactful to least impactful. Certainly there are factors to consider in addition to impactfulness, but mustn't magnitude of impact be a paramount consideration for placemaking—a strategy intended to enhance the attractiveness of systemically-important streets, blocks, or neighborhoods?

The benefit-cost ratios (BCRs) and property value impact multipliers (PVIMs) presented earlier in this study are the result of quantitative analysis, not qualitative analysis and surveys. These BCRs and PVIMS are the tools MEDC needs to measure and predict the impact of its future CDI investments. The observations and recommendations below provide some instruction on how to use the tools.

"The precursors to economic growth (e.g., entrepreneurship, knowledge, talent, industries) are attracted to locations that are enhanced through placemaking."

– Adelaja, et al, 2012

Further Insights, Recommendations, and Limitations

INVESTMENT STRATEGIES FOR SMALL AND LARGE CITIES

Final results suggest that in the areas where MEDC invested in large cities (Detroit, Grand Rapids, and Lansing), commercial properties are denser and presumably much more valuable than residential properties. Conversely, final results suggest that in the areas where MEDC invested in small cities (Marquette, Adrian, and Alpena), residential properties are much less dense near their respective downtowns.

We therefore see a higher relative proportion of total impact attributed to commercial property values in large cities and a higher relative proportion of total impact attributed to residential impact in small cities. Thus returns to investors may be more readily available in larger cities, and likely explain the market activity that shows MEDC being a larger proportion of total investment in smaller cities than in larger cities.

Given that MEDC Community Development Incentives (CDI) Programs invest in commercial corridors, and these programs are shown to impact both residential and commercial properties within 2,000 feet of those investments, the density of commercial property and the density of residential property is relevant in determining the total impact of investments. Further, the value of buildings in the areas of investment will cause variance in impact as well; when a deal site is surrounded by higher value property, the deal impact will be greater.

It follows that large cities with dense commercial property concentrations in their central business districts will experience higher commercial property value impacts. Conversely, small towns and commercial corridors of larger cities—where MEDC will experience a greater relative proportion of impact to residential properties—are usually situated very close to small-town downtowns and secondary commercial corridors.

From the observations above, the following insights are provided for site selection in larger cities:

- When a policy goal in large cities is to achieve maximum positive property value impact, make large deals in central business districts.
- When a policy goal in large cities is neighborhood stabilization, make smaller deals on secondary commercial corridors abutting residential density.

Small cities generally do not face the "central business district vs. secondary business corridor" dichotomy faced by large cities. Instead, CDI investments appear to be concentrated in downtowns—the central business districts. These smaller downtowns are usually abutted by dense residential areas. In smaller cities, overall nearby density—both commercial and residential—predicts greatest property value impact.

The following insights are provided for site selection in smaller cities:

- When an investment site is selected in the middle of a downtown, expect the property value impact to occur primarily in the downtown itself.
- When an investment site is selected at the edge of a downtown and abutting a residential neighborhood, expect the property value impact to occur primarily in the residential neighborhood.
- When an investment site is selected at the edge of a downtown but not abutting a residential neighborhood, expect a muted or low overall property value impact.

Further Insights, Recommendations, and Limitations

OCCUPANCY RATES AND PROPERTY VALUES

Housing and commercial real estate literature empirically shows that vacancy in these buildings creates negative impacts on nearby property values and crime rates, among other key neighborhood health determinants.[o] Thus, when occupancy rates are trending downward in a neighborhood or commercial corridor it can safely be assumed that property values and other economic health determinants will correlatively follow in the negative trend. Conversely, increasing residential and commercial occupancy rates over time suggest a trend of increasing demand for housing and commercial in a given area, thus increasing scarcity of real estate and driving prices up.[p] Thus, property value impacts and occupancy rate impacts are inextricably linked, and keeping tuned-in to both is key as place-based investments fill in previously unoccupied spaces and thus stabilize and increase property values over time. Therefore, policies aimed at attracting more people to live, work, and play in a concentrated commercial area (increasing occupancy rates) and it's adjacent walking distance residential properties, will drive real estate prices up in each if the occupancy rate policy objective is met.

AVOIDING DISPLACEMENT

Gentrification often leads to displacement of members of historically disadvantaged communities, and it is well-accepted that public investment should strive to avoid accelerating such displacement. This study suggests that public investors can minimize the risks of accelerating displacement by taking the following approaches:

- Identify areas of rapid year-over-year property value increases and rental rate increases, and avoid making large investments in those areas.
- In larger cities—where displacement is generally a more significant social concern—make more widely distributed and smaller investments in secondary commercial corridors abutting residential neighborhoods. Doing so will lead to the positive property value impacts being more widely distributed amongst homeowners, leading to neighborhood stabilization, not transformation.

In these larger cities, consider strategies that build capacity for smaller, local developers. For example, MEDC is working to implement an emerging developer outreach strategy to help build local development capacity and remove barriers to programming to allow for better access to tools and services. As a result of this effort, smaller incremental development is anticipated to follow.

LIMITATIONS ON PROPERTY VALUE IMPACT MODEL

Although the results of this study suggest that deal completion led to higher nearby property values, our models are not without significant scientific limitations. First, while the models were able to utilize an unprecedentedly large and complex data set on property transactions across several urban areas, the post-investment effects are driven by the comparatively smaller subset of observations that occurred one year or greater after completion of the deals, particularly for commercial properties. Even though this effect was fairly robust to shortening the length of time used in the analysis and to inclusion or exclusion of other property control variables, more data on post-investment sales would improve the confidence in the estimated effects.

In addition, more data on investments from other urban areas would improve the ability of the models to forecast effects in markets that were not included in the original model development. More data on property transactions, including direct observational areas in addition to the six cities, would increase the robustness of the results. As discussed below in the "Metrics: Predict, then Measure" section of this report, MEDC will ideally obtain real-time, publicly-available property data for all Michigan's urbanized areas.

In interpreting the model results, it is useful to keep in mind that a common concern with statistical analyses is the distinction between correlation and causation. In an observational study of the effect of a policy intervention, a correlation might not reveal causation when the intervention was not randomly assigned and might be somehow correlated with unobserved characteristics of the properties or areas. Given that a fully randomized observational study is not possible when measuring impacts of a policy that has already been implemented, our methods are the practical solution to evaluating and understanding the causal effect of the policy action of MEDC. We did not perform this study in a laboratory, but in living communities, and thus the robustness of our results is limited accordingly.

Further Insights, Recommendations, and Limitations

LIMITATION ON NEARBY RESIDENTIAL PROPERTY VALUE ANALYSIS

We were unable to obtain property level information and assessor's values near MEDC investment outside of the six cities. This led us to find an alternate method to locate and quantify residential property values. For this, we utilized Census data to identify the number of homes in each Census Tract. We then generated an equal number of the same sized polygons to each Tract to represent a house within every Census Tract. Each house polygon was then assigned a value based on the median home value within the Census Tract. Then, we calculated the total investment nearby to each polygon and applied the appropriate model coefficients to estimate the value of each home if nearby MEDC investments had not occurred. This analysis was run statewide.

Results of the statewide residential impact analysis were then compared to the results of the same analysis in the six cities which utilized the assessed values of homes and their specific locations. The total impact of the method which utilized actual property data was 60% of the estimated impact using the alternate method which utilized artificial polygons and Census data to represent homes. As a result, we took the statewide residential counterfactual simulation estimates and reduced the total impact to 60% of the original estimate.

METRICS: PREDICT, THEN MEASURE

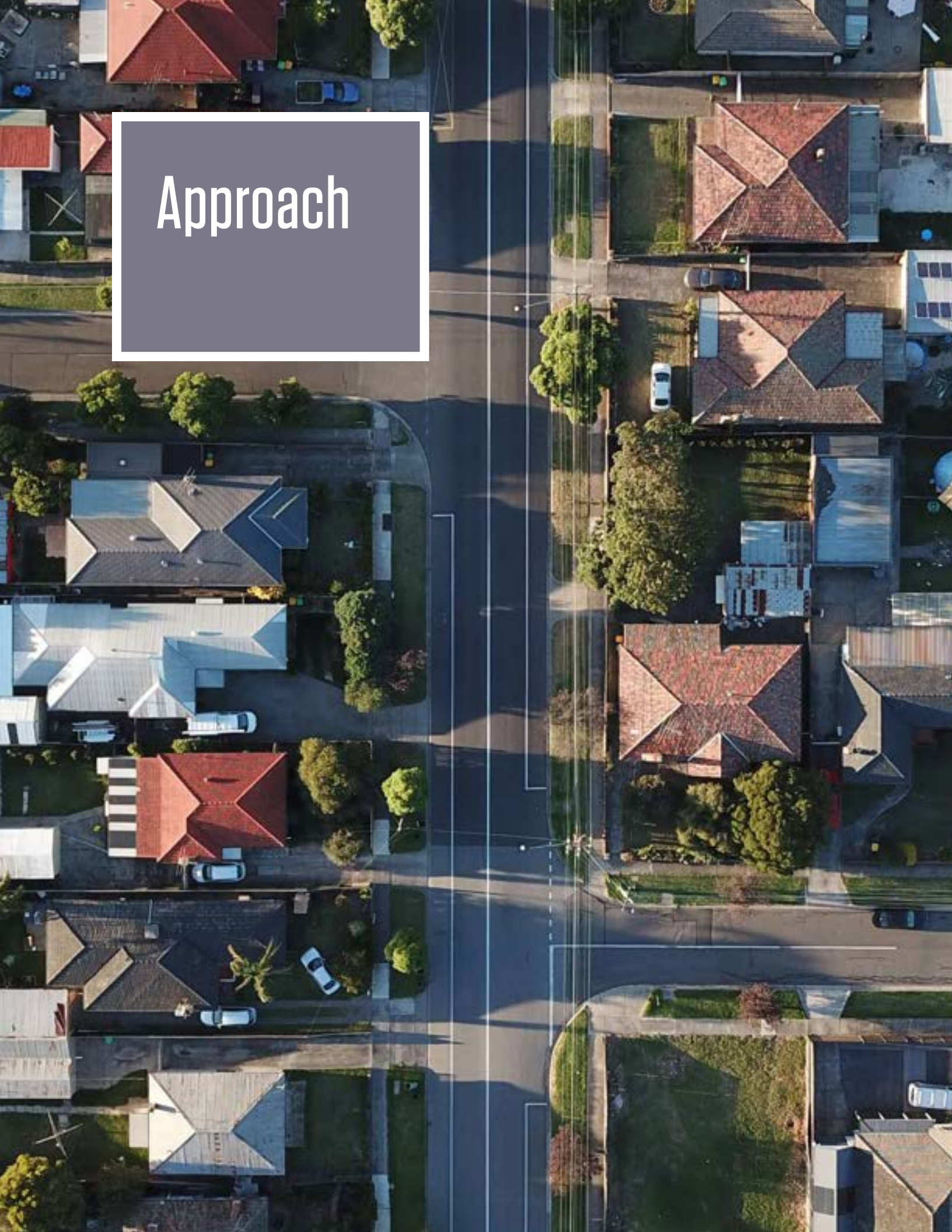
This study provides MEDC with predictive tools which allow for the estimation of investment impacts on surrounding properties' market values. As discussed above, this hedonic property valuation analysis does not disturb or supplant REMI PI+ modeling, but instead provides the impact information REMI PI+ modeling cannot provide. Together, REMI PI+ modeling and Dynamo's predictive analysis will allow MEDC to more fully predict—then measure—the impact of its work.

If REMI PI+ Modeling remains largely unavailable for CDI investments, the use of hedonic price modeling may instead be combined with existing qualitative measurements to vastly enhance the programs' evaluative and predictive capabilities. This is especially true for public investments that have placemaking as their explicit goal. Placemaking is concerned with the well-being of the neighborhood, the community, and showing the extent that the investment will improve the value of neighboring properties is arguably the most important benchmark for such programs.

In order for MEDC to use Dynamo's property value impact multipliers (PVIMs) to estimate the impact of various proposed investments, MEDC must know the market values of all commercial and residential properties within 2,000 feet of each proposed site. As a practical matter, this means MEDC needs to know the market value of each property in the city. Proxies for market value (assessed value) are available from city and county offices, so MEDC could develop its own protocols for harvesting and applying this information. In preparing this study, Dynamo obtained the full data specifications from local government offices for the six cities; MEDC could do the same for every city in which it invests.

With its current Neighborhood Intel software, MEDC can predict the impact of its investments on residential properties statewide, predict the impact of commercial investment in the six cities, and quantify the impact of its past investments evaluated in this study. With additional development, MEDC's Neighborhood Intel platform is also capable of providing real-time property information and impact metrics for urbanized Michigan communities, many of which are already leveraging these capabilities in their own Neighborhood Intel platforms. This would empower MEDC with the capability to see predicted commercial property value impact outside of the six cities, identify fundamental shifts in the economy that could impact the outcomes of its work, create updated reports on the impact of its newly completed work, and ultimately make more targeted, impactful investments.

Approach



Approach

DATA REQUIREMENTS

To perform this study Dynamo needed to supply Neighborhood Intel with data sufficient to perform fully-specified, spatially-oriented hedonic modeling and difference-in-differences analysis. MEDC provided program information and other data sources are listed throughout this section.

Dynamo uses a consistent standard for property-level data that all customer and study data gets transformed into regardless of its native system and format. We have worked with more than ten cities to convert their data into Dynamo's standard for Neighborhood Intel, and many more for research projects focused on program evaluation. This data standard enables a consistent product for all of our customers and ensures we can implement economic and other impact modeling. Additionally, Dynamo's consistent data standard means that those things we learn about neighborhoods and changes in cities where we have property-level data can be used to help understand impacts and outcomes in similar neighborhoods in other cities where we don't have property-level data.

Data Transformation

Dynamo worked with City department heads and IT personnel to get untransformed data backups of the tables necessary for this study. Broadly speaking, Dynamo's standard data for analysis and Neighborhood Intel includes:

- Property attributes (building area, bedrooms, bathroom, age, zoning, land use etc.)
- Property transactions (sales, foreclosures, transfers etc.)
- Property GIS files
- Property specific occupancy was purchased through Valassis Communications, Inc.
- Publicly available data Dynamo provides that is not housed within the City or County, which includes:
    - Census Tract Socio-economics and demographics provided by the US Census Bureau American Community Survey
    - Municipal boundaries and Census Tract GIS boundary files provided by the US Census Bureau
    - Job counts by Census Block provided by the US Census Bureau Longitudinal Employer Housing Dynamics dataset

Dynamo received six city data from City Assessors and GIS departments.

Steps in technical installation process included:

- Historical data transfer and receipt
- Data validation (is data consistent and complete)
- Data transformation (all data needed transformed into a common standard across study cities)
- Data load into Neighborhood Intel
- Economic impact modeling
- Launch of Neighborhood Intel

Once six city data was incorporated into the Neighborhood Intel data infrastructure, Dynamo generated the analysis ready datasets used for the hedonic and difference-in difference methodologies (explained in the section below) utilized for this study. This involved:

- identifying property transactions and occupancy statistics, status and physical and other attributes for every property in the six cities,
- identifying when a property sold relative to each MEDC investment,
- identifying occupancy statistics of properties nearby to and before and after MEDC investments,
- generating variables that control for the status and attributes of other properties nearby to each sold or occupied property to enable isolating the impact of each MEDC investment,

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- summarizing socioeconomic and demographic Census Tract level socio-economic and demographic data to isolate the type of neighborhood each investment and nearby property are located in, and
- quantifying the amount of nearby MEDC investment at varying distances from each nearby property.

METHODOLOGIES

Choosing the Six Empirical Analysis Cities

The method to choose six Michigan cities as the focus of the parcel-level MEDC CDI Program evaluation study was driven by MEDC CDI observational program data on actual investments along with the following objectives with a goal of strong observational variation across cities for maximum evaluative insight about the spatial external impact of the programs of interest: (1) geographic diversity, (2) programmatic expenditure diversity, (3) sufficient deal flow through the given study time frame, (4) data availability, (5) variability across population size, and, (6) economic variability across large cities and small cities. All relevant analysis was completed and the six cities were chosen from this analysis.

Building Statewide Real Estate Submarkets

Submarkets group alike neighborhoods based on socioeconomic and demographic factors. In our past research and that of others, we have found that impacts typically vary by submarket. Hedonic analysis requires a data-based understanding of how neighborhoods themselves—as opposed to individual properties—perform relative to one another. Place matters, and we translate that knowledge by means of a two-stage multivariate cluster analysis.[q] Our two-stage cluster analysis approach used Census Tract-level data from the U.S. Census Bureau's 2017 American Community Survey and Longitudinal Employer-Household Dynamics data.

Preparing Property-level Time-series Data

There were multiple stages of data collection and preparation throughout the study. MEDC provided program data, and Dynamo then cleaned and refined all relevant CDI activity data. The refined data established the geolocation, property attributes, date for every deal start, and amounts invested by MEDC and private sources.

Once the six cities were chosen, Dynamo built parcel-level time-series data systems for each of them. These data systems contain both city-level property data provided by public officers (City Assessor and GIS Departments) and private data resources such as Valassis which provides property-level occupancy status. This combination of data resources allowed us to obtain a full specification of property transactions (sales foreclosures etc.) and physical attributes (sq. ft, bedrooms, property type etc.) of properties themselves. Additionally, we built variables to identify the status and attributes of properties within the immediate vicinity of every other property in each of the six cities during the entire empirical analysis period.

The data was then prepped for final occupancy and property impact evaluation analysis. Upon completion of final models, the data was then utilized to perform application of findings with benefits transfer and counterfactual simulation analysis.

Hedonic Property Value Modeling[27]

Hedonic modeling provides estimates of the marginal implicit value of structural and neighborhood characteristics associated with real property. For example, the sales price of a single-family home can be predicted if you know all its attributes: square footage, age, number of bedrooms and bathrooms, proximity to parks and schools, the condition, value, and property tax status of surrounding homes, etc. Commercial and industrial property values can be estimated in much the same way. Full hedonic modeling—as contradistinguished from the "repeat sales" derivation developed by Case and Schiller[r]—requires the spatio-temporal organization of high-quality time-series property-level information.[28, s] Two hedonic property value models were estimated in the empirical analysis for this study—a residential model and a commercial model—both yielding the key property value impact multipliers (PVIMs) of impact from MEDC CDI investments on commercial and residential property values.

Approach

Benefits Transfer Analysis (Residential Properties Only)
The benefits transfer analysis leverages the two-stage multivariate cluster analysis and the statewide submarket regimes it creates to allow us to apply insights from the empirical six cities' CDI impact analysis to alike places throughout the State of Michigan. Alikeness was determined by our submarket analysis and reduced to three submarkets found statewide. Alikeness could only be applied to residential properties because of data constraints; specifically, commercial property values are not reported in a state-level aggregation. We were therefore constrained to use the consistently and publicly available U.S. Census Bureau median home values data to estimate the residential impact of each residential submarket multiplier, while only being able to deliver commercial property impacts in the six representative cities. In other words, no benefits transfer method was available for application of commercial property value impacts outside the six cities.

Counterfactual Simulation
The counterfactual simulation asks, how much lower would Michigan property values have been on today had the 542 MEDC CDI deals never occurred?

This intensive quantitative method involves using the outputs of the hedonic model to compare the estimated value of commercial and residential property in Michigan today—meaning all MEDC CDI deals that positively impacted property values—with what the value would have been today if none of the deals occurred.

In the six representative cities, the counterfactual simulation was run for commercial properties. Commercial property value impacts were unable to be calculated outside of the six cities, because local value assessments of nearby commercial properties were unavailable.

Statewide counterfactual simulation calculations for residential property values utilized both local value assessments and publicly available home value estimates from the US Census Bureau.

To accomplish this, we utilized Census data to identify the number of homes in each Census Tract. We then generated an equal number of the same sized polygons to each Tract to represent a house within every Census Tract. Each house polygon was then assigned a value based on the median home value within the Census Tract.
Then, we calculated the total investment nearby to each polygon and applied the appropriate model coefficients to estimate the value of each home if nearby MEDC investments had not occurred. Results of the statewide residential impact analysis were then compared to the results of the same analysis in the six cities.

The total impact of the method which utilized actual property data was 60% of the estimated impact using the alternate method which utilized artificial polygons and Census data to represent homes. As a result, we took the statewide residential counterfactual simulation estimates and reduced the total impact to 60% of the original estimate.[29]

Difference-in-differences Occupancy Rate Modeling
Difference-in-differences (DID), as approached in our analysis, considers the commercial and residential occupancy rates and their respective time-series fluctuations throughout the six cities of the empirical analysis. Our DID modeling approach considered whether or not properties were within 1,000 feet of MEDC CDI activity and how their respective occupancy rates fluctuate over time near and not near MEDC CDI investment. This approach was possible because we had occupancy rate data over time for commercial and residential properties which we were able to overlay with MEDC CDI program data with respect to geolocation.[30]

Appendices



Appendix 1: MEDC Community Development Incentives Investment, Property Value Impact, and Benefit-cost Ratios (BCRs) by City and By Submarket

APPENDIX 1: MEDC COMMUNITY DEVELOPMENT INCENTIVES INVESTMENT, PROPERTY VALUE IMPACT, AND BENEFIT-COST RATIOS (BCRS) BY CITY AND BY SUBMARKET							
City	Submarket Cluster	Deal Count	Total Impact	Total MEDC Investment	MEDC Investment BCR	Total Investment (MEDC + Private)	Total Investment BCR
Detroit	Weak	37	$609,996,291	$69,839,507	8.73	$321,142,598	1.9
	Middle	33	$1,803,576,418	$154,565,826	11.67	$858,909,369	2.1
	Strong	12	$306,512,031	$47,924,862	6.4	$306,332,192	1
Grand Rapids	Weak	24	$216,877,614	$118,583,990	1.83	$557,685,044	0.39
	Middle	19	$225,451,629	$28,886,166	7.8	$225,887,307	1
	Strong	17	$293,319,452	$75,199,314	3.9	$494,315,963	0.59
Lansing	Weak	11	$271,204,623	$18,770,743	14.45	$59,615,317	4.55
	Middle	2	$26,396,798	$25,645,280	1.03	$113,118,821	0.23
Marquette	Middle	7	$75,192,721	$77,673,760	0.97	$284,841,497	0.26
	Strong	1	$8,871,541	$228,750	38.78	$744,756	11.91
Adrian	Weak	6	$13,967,169	$5,260,135	2.66	$8,065,409	1.73
Alpena	Weak	7	$13,420,119	$2,432,591	5.52	$12,150,119	1.1
	TOTAL	**176**	**$3,864,786,405**	**$625,010,924**	**6.18**	**$3,242,808,392**	**1.19**

Appendix 2A: Occupancy Change at MEDC CDI Deal Properties
Appendix 2B: Direct Occupancy Rate Impact on MEDC CDI Existing Structure Targets, 2011–2017

APPENDIX 2.A

For Parcels That Existed For The Whole Empirical Study Period

Year_Quarter	Occupied Units	Unoccupied Units	Percent Occupancy	Count Of Parcels
2011_1	190	67	73.93%	106
2011_2	195	68	74.14%	106
2011_3	169	66	71.91%	106
2011_4	199	66	75.09%	106
2012_1	201	65	75.56%	106
2012_2	205	64	76.21%	106
2012_3	177	72	71.08%	106
2012_4	197	77	71.90%	106
2013_1	176	57	75.54%	106
2013_2	199	68	74.53%	106
2013_3	209	76	73.33%	106
2013_4	204	60	77.27%	106
2014_1	188	75	71.48%	106
2014_2	218	78	73.65%	106
2014_3	213	62	77.45%	106
2014_4	201	76	72.56%	106
2015_1	200	84	70.42%	106
2015_2	193	87	68.93%	106
2015_3	206	78	72.54%	106
2015_4	274	84	76.54%	106
2016_1	277	82	77.16%	106
2016_2	275	83	76.82%	106
2016_3	299	84	78.07%	106
2016_4	342	82	80.66%	106
2017_1	364	84	81.25%	106
2017_2	334	80	80.68%	106
2017_3	317	92	77.51%	106
2017_4	357	92	79.51%	106

APPENDIX 2.B

Direct Occupancy Rate Impact on MEDC CDI Existing Structure Targets, 2011–2017

	Total Buildings Receiving Direct MEDC Investment	Occupied Units	Vacant Units	Occupancy Rate
Q1 2011	106	190	67	73.93%
Q4 2017	106	357	92	79.51%
Change During Program Period	-	167	25	5.58%
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Appendix 3: New Occupancy at MEDC CDI Deal Properties

APPENDIX 3 : NEW OCCUPANCY AT MEDC CDI DEAL PROPERTIES				
Newly Created Parcels Appearing After 2011_1 (New buildings or Significantly Changed Buildings)				
Year Quarter	**Occupied Units**	**Unoccupied Units**	**Percent of Occupancy**	**Count of Parcels**
2012_3	1	0	100.00%	1
2012_4	1	0	100.00%	1
2013_1	2	5	28.57%	9
2013_2	3	4	42.86%	9
2013_3	3	4	42.86%	9
2013_4	59	4	93.65%	9
2014_1	61	4	93.85%	11
2014_2	129	4	96.99%	11
2014_3	128	5	96.24%	11
2014_4	128	5	96.24%	11
2015_1	130	6	95.59%	18
2015_2	178	6	96.74%	18
2015_3	180	4	97.83%	18
2015_4	180	4	97.83%	18
2016_1	181	4	97.84%	29
2016_2	227	4	98.27%	29
2016_3	250	5	98.04%	29
2016_4	252	5	98.05%	29
2017_1	252	7	97.30%	37
2017_2	253	7	97.31%	37
2017_3	253	7	97.31%	37
2017_4	271	7	97.48%	37

Appendix 4: MEDC CDI Investment by Program, 2008–2019

APPENDIX 4: STATEWIDE MEDC COMMUNITY DEVELOPMENT INCENTIVES (CDI) INVESTMENT BY PROGRAM, 2008–2019				
CDI Programs Evaluated	**Deal Count**	**Private Investment**	**MEDC Investment**	**Investment Total**
Brownfield TIF, CDBG	3	$14,341,658	$6,723,930	$21,065,588
CDBG, MCRP	2	$25,384,864	$5,303,801	$30,688,665
PSCP	130	$31,603,938	$4,112,273	$36,497,964
CDBG	173	$69,078,679	$75,964,175	$145,042,854
Brownfield TIF, MCRP	42	$818,727,093	$296,619,421	$1,115,346,514
MCRP	85	$1,041,717,710	$191,370,854	$1,233,088,564
Brownfield TIF	107	$2,255,508,255	$515,740,145	$2,771,248,400
TOTAL	**542**	**$4,256,362,197**	**$1,095,834,599**	**$5,352,978,549**

Appendix 5: MEDC CDI Average Investment Summary Statistics by Program, 2008–2019

STATEWIDE MEDC COMMUNITY DEVELOPMENT INCENTIVES (CDI) INVESTMENT STATISTIC AVERAGES BY PROGRAM, 2008–2019					
CDI Programs Evaluated	**Average MEDC Investment Per Deal**	**Average Private Investment Per Deal**	**Average Total Investment Per Deal**	**Average MEDC Leverage Per Private Dollar**	**Average MEDC % of Deal**
Brownfield TIF, CDBG	$2,241,310	$4,780,553	$7,021,863	$2.13	31.90%
CDBG, MCRP	$2,651,901	$12,692,432	$15,344,333	$4.79	17.30%
PSCP	$31,633	$243,107	$280,754	$7.69	11.30%
CDBG	$439,099	$399,299	$838,398	$0.91	52.40%
Brownfield TIF, MCRP	$7,062,367	$19,493,502	$26,555,869	$2.76	26.60%
MCRP	$2,251,422	$12,255,502	$14,506,924	$5.44	15.50%
Brownfield TIF, MCRP	$4,820,001	$21,079,516	$25,899,518	$4.37	18.60%
TOTAL	**$2,021,835**	**$7,853,067**	**$9,876,344**	**$3.88**	**20.50%**

Appendix 6: Total Investment and Deal Count by Location, 2008–2019

APPENDIX 6: TOTAL INVESTMENT AND DEAL COUNT BY LOCATION, 2008–2019				
City	Deal Count	Private Investment	MEDC Investment	Total Investment
Adrian	6	$2,805,274	$5,260,135	$8,065,409
Alpena	7	$9,711,248	$2,432,591	$12,150,119
Detroit	82	$1,214,053,964	$272,330,195	$1,486,384,159
Grand Rapids	60	$1,055,186,404	$222,669,470	$1,277,888,314
Lansing	13	$128,318,115	$44,416,023	$172,734,138
Marquette	8	$207,675,018	$77,902,510	$285,586,253
Six-City Total	176	$2,617,750,023	$625,010,924	$3,242,808,392
Outside Six Cities	366	$1,638,612,174	$470,823,675	$2,110,170,157
TOTAL INVESTMENT	**542**	**$4,256,362,197**	**$1,095,834,599**	**$5,352,978,549**

IMPORTANT NOTE: The total MEDC investments by city may higher than that listed here as a result of MEDC programs beyond those evaluated in this study (CRP, CDBG, Brownfield, and Patronicity) because Dynamo Metrics does not have program expenditure data on other MEDC programs.

Appendix 7: Data Sources

APPENDIX 7: DATA SOURCES	
Adrian City Assessor's Office	Property transactions, physical attributes and parcel geometries
Alpena City Assessor's Office	Property transactions, physical attributes and parcel geometries
Detroit City Assessor's Office	Property transactions, physical attributes and parcel geometries
Grand Rapids City Assessor's Office	Property transactions, physical attributes and parcel geometries
Lansing Assessor's Office	Property transactions, physical attributes and parcel geometries
Marquette City Assessor's Office	Property transactions, physical attributes and parcel geometries
Valassis Communication, Inc	Property Occupancy
Michigan Economic Development Corporation	MEDC property-level Investments
US Census Bureau American Community Survey	Socioeconomic and Demographic Data, Census tract geometries
US Census Bureau Longitudinal Employer Household Dynamics	Employment counts, type and incomes
Attom Data Solutions	Property transactions in Detroit only

Appendix 8: Averaged Summary Statistics for Statewide Real Estate Submarkets in 2017

APPENDIX 8: AVERAGED SUMMARY STATISTICS FOR STATEWIDE REAL ESTATE SUBMARKETS IN 2017			
Market Cluster Strength	**Weak**	**Medium**	**Strong**
Statewide Count of Census Tracts[31, t]	1347	1181	239
Population	3,136	3,984	4,101
Housing Units	1,529	1,765	1,674
Median Rent	$581	$732	$1,102
Median Home Value	$69,419	$156,443	$315,277
Housing Occupancy Rate	80.11%	87.45%	92.24%
Housing Vacancy Rate	18.93%	11.54%	7.76%
Owner Occupancy Rate	62.70%	73.82%	81.62%
Education: Bachelor's Degree or More Rate	14.71%	31.53%	59.38%
Poverty Rate	25.82%	11.90%	6.84%
1-bedroom Home Rate	9.79%	8.34%	5.68%
2-bedroom Home Rate	28.78%	23.08%	15.61%
3-bedroom Home Rate	45.45%	44.52%	34.27%
4-bedroom Home Rate	10.85%	17.99%	35.18%
5-bedroom + Home Rate	2.60%	3.66%	7.96%
Housing Age Rate: 2014 - Present	0.08%	0.22%	0.45%
Housing Age Rate: 2010 - 2013	0.48%	0.99%	1.57%
Housing Age Rate: 2000 - 2009	5.37%	12.42%	14.16%
Housing Age Rate: 1990 - 1999	6.79%	15.97%	18.94%
Housing Age Rate: 1980 - 1989	6.17%	11.27%	13.70%
Housing Age Rate: 1970 - 1979	11.57%	17.74%	15.64%
Housing Age Rate: 1960 - 1969	12.23%	12.16%	11.04%
Housing Age Rate: 1950 - 1959	21.27%	11.69%	10.19%
Housing Age Rate: 1940 - 1949	12.66%	5.00%	3.72%
Housing Age Rate: 1939 or Earlier	22.40%	11.52%	10.58%
Housing Year Built Average	1937	1975	1977
Household Size (People)	2.48	2.46	2.64
Household with Kids Rate	29.79%	28.04%	32.74%
Median Age	38.3	41.6	43.5
Race Rate: White	63.24%	86.17%	84.62%
Race Rate: African American	29.00%	7.29%	5.27%
Race Rate: Native American	0.62%	0.51%	0.21%
Race Rate: Asian American	1.25%	2.92%	7.32%
Race Rate: Pacific Islander American	0.03%	0.03%	0.02%
Race Rate: Other Americans	1.63%	0.70%	0.37%
Gender Rate: Male Identify	50.39%	50.30%	47.76%
Gender Rate: Female Identify	49.24%	49.10%	52.24%

Appendix 9: Stage 1 Multivariate Cluster Analysis—Principal Components Analysis (PCA) Loadings[32,u]

APPENDIX 9: STAGE 1 MULTIVARIATE CLUSTER ANALYSIS—PRINCIPAL COMPONENTS ANALYSIS LOADINGS			
Variables in PCA	**Principal Component 1**	**Principal Component 2**	**Principal Component 3**
Population Density	0.2876377192	0.03417488713	0.3231328535
Median Home Value	-0.3516666665	-0.1306692609	0.4209784019
Owner Occupancy Rate	-0.4270407001	0.1975495147	-0.1495349543
Education: Bachelor's Degree or More Rate	-0.2483364715	-0.2017038129	0.5389183922
Unemployment Rate	-0.04090707378	-0.07315348668	0.436518552
Household Size	-0.1187057373	0.5984081753	0.1599019323
Household Median Age	-0.198706237	0.2864024036	0.1607390141
Households with Kids Rate	-0.0356078215	0.5825362284	0.1564701418
Median Age	-0.3388602096	-0.07757350708	-0.1740021298
Race Rate: White Americans	-0.4484374256	-0.1082006309	-0.1467157968
Race Rate: African Americans	0.4060803111	0.1816573812	0.1187132136
Earning Greater than $3,333/year	-0.009858582427	-0.1132827209	0.1043920636
Proportion of Variance	0.2734423	0.1662477	0.1380863
Cumulative Proportion of Variance	0.2734423	0.43969	0.5777763

Appendix 10: Residential Hedonic Property Value Model - Final Specification

APPENDIX 10: RESIDENTIAL HEDONIC PROPERTY VALUE MODEL – FINAL SPECIFICATION						
Number Of Residential Sales Observed in Six Cities, 2011–2017	**69129**					
Degrees of Freedom (85, 69043)	3031.91					
Prob > F	0					
R-squared	0.6964					
Root MSE	0.72072					
DEPENDENT VARIABLE: NATURAL LOG OF RESIDENTIAL SALES PRICE						
Independent Variables						
	Coefficient	**Standard Error**	**T-Value**	**P-Value**	**95% Confidence Interval**	
Key Independent Variables						
Natural Log of Total Investment Amount if Present and Within 500 Feet in Weak Submarket 1 Year or More Before Sale	0.0100536	0.0021404	4.7	0.000	0.0058585	0.0142487
Natural Log of Total Investment Amount if Present and Within 501-2,000 Feet in Weak Submarket 1 Year or More Before Sale	0.0047609	0.0005501	8.65	0.000	0.0036827	0.0058391
Natural Log of Total Investment Amount if Present and Within 1,000 Feet in Middle Submarket 1 Year or More Before Sale	0.0141564	0.0013316	10.63	0.000	0.0115464	0.0167664
Natural Log of Total Investment Amount if Present and Within 1,001-2,000 Feet in Middle Submarket 1 Year or More Before Sale	0.0094968	0.0008987	10.57	0.000	0.0077353	0.0112583
Natural Log of Total Investment Amount if Present and Within 500 Feet in Strong Submarket 1 Year or More Before Sale	0.0227653	0.0035539	6.41	0.000	0.0157996	0.029731
All Other Independent Control Variables						
500 Foot Control Dummy if Sales Property falls Within 500 Feet of an MEDC Investment Site	0.1349076	0.0190936	7.07	0.000	0.0974842	0.172331
500 Foot Control Dummy if Sales Property falls Within 501-1,000 Feet of an MEDC Investment Site	0.1065425	0.0144528	7.37	0.000	0.0782151	0.1348699
500 Foot Control Dummy if Sales Property falls Within 1,001-1,500 Feet of an MEDC Investment Site	0.1355901	0.0127638	10.62	0.000	0.1105731	0.1606071
500 Foot Control Dummy if Sales Property falls Within 1,501-2,000 Feet of an MEDC Investment Site	0.1182602	0.0116949	10.11	0.000	0.0953383	0.141182
Weak Submarket Indicator	Omitted Submarket Control Indicator Variable					
Middle Submarket Indicator	0.1079504	0.0094872	11.38	0.000	0.0893555	0.1265454
Strong Submarket Indicator	0.4868274	0.0324834	14.99	0.000	0.42316	0.5504949
City of Adrian Indicator	-0.2979566	0.0196928	-15.13	0.000	-0.3365546	-0.2593587
City of Alpena Indicator	-0.3592068	0.0220477	-16.29	0.000	-0.4024201	-0.3159934
City of Detroit Indicator	-0.6383508	0.0131983	-48.37	0.000	-0.6642195	-0.6124821
City of Grand Rapids Indicator	Omitted City-Level Control Indicator Variable					
City of Lansing Indicator	-0.2179062	0.0088039	-24.75	0.000	-0.2351617	-0.2006507
City of Marquette Indicator	0.2185326	0.0214774	10.17	0.000	0.1764369	0.2606283
Warranty Deed Sale Indicator	0.1876892	0.0091948	20.41	0.000	0.1696674	0.205711
Quit Claim Deed Sale Indicator	-0.672399	0.0145068	-46.35	0.000	-0.7008323	-0.6439658
Sheriff's Deed (REO) Sale Indicator	-0.4974588	0.0086267	-57.66	0.000	-0.5143671	-0.4805505

Appendix 10 (continued):

Number of Bathrooms	0.1928104	0.0087116	22.13	0.000	0.1757357	0.2098851
Fireplace Indicator	0.1335451	0.0056262	23.74	0.000	0.1225177	0.1445725
Garage Indicator	0.045474	0.0056261	8.08	0.000	0.0344469	0.0565012
Age of Sold Property	-0.0032896	0.0001343	-24.49	0.000	-0.0035529	-0.0030263
Renter Occupancy at Time of Sale Indicator	-0.0147307	0.0069252	-2.13	0.033	-0.0283041	-0.0011574
Unoccupied at Time of Sale Indicator	-0.1518921	0.0089306	-17.01	0.000	-0.169396	-0.1343882
Tax Foreclosed at Time of Sale Indicator	-0.5241622	0.0258663	-20.26	0.000	-0.5748602	-0.4734643
Land Bank Owned at Time of Sale Indicator	-0.5052692	0.0721484	-7	0.000	-0.6466799	-0.3638585
Count of Owner occupied within 500 feet	0.0015579	0.0000767	20.32	0.000	0.0014076	0.0017082
Count of Renter occupied within 500 feet	-0.0010183	0.0002027	-5.02	0.000	-0.0014156	-0.0006209
Count of Unoccupied within 500 feet	-0.0121739	0.0006076	-20.04	0.000	-0.0133648	-0.010983
Count of Residential buildings tax foreclosed within 500 feet	-0.0187179	0.0011376	-16.45	0.000	-0.0209476	-0.0164882
Count of Residential buildings mortgage foreclosed unoccupied within 500 feet	0.0145423	0.002257	6.44	0.000	0.0101185	0.018966
Count of Residential buildings mortgage foreclosed occupied within 500 feet	-0.0059397	0.0032361	-1.84	0.066	-0.0122824	0.000403
Count of Residential buildings land bank owned within 500 feet	-0.0131118	0.0006391	-20.51	0.000	-0.0143645	-0.0118591
Count of Vacant lot residential within 500 feet	-0.0116871	0.0033321	-3.51	0.000	-0.0182179	-0.0051562
Count of Commercial occupied retail within 500 ft	-0.0007055	0.0002852	-2.47	0.013	-0.0012645	-0.0001466
Count of Commercial unoccupied retail within 500 ft	-0.0049666	0.0029529	-1.68	0.093	-0.0107543	0.000821
Count of Vacant lot other within 500 ft	-0.0076375	0.0008376	-9.12	0.000	-0.0092791	-0.0059958
Count of Commercial building occupied office within 500 ft	0.0032517	0.0010792	3.01	0.003	0.0011365	0.0053669
Count of Commercial building unoccupied office within 500 ft	-0.0009595	0.0023493	-0.41	0.683	-0.005564	0.0036451
Count of Commercial building occupied hotel within 500 ft	0.0028765	0.0009229	3.12	0.002	0.0010676	0.0046854
Count of Commercial building unoccupied hotel within 500 ft	0.008863	0.0113288	0.78	0.434	-0.0133415	0.0310675
Count of Commercial building occupied multi-family within 500 ft	0.0003744	0.000101	3.71	0.000	0.0001764	0.0005723
Count of Commercial building unoccupied multi-family within 500 ft	-0.0011959	0.000726	-1.65	0.100	-0.0026189	0.0002272
Count of Commercial building occupied special customer within 500 ft	-0.0110626	0.0043102	-2.57	0.010	-0.0195106	-0.0026146
Count of Commercial unoccupied special customer within 500 ft	-0.0255458	0.0163476	-1.56	0.118	-0.0575871	0.0064955
Count of Commercial building occupied special storage within 500 ft	-0.0248372	0.008219	-3.02	0.003	-0.0409465	-0.0087279
Count of Commercial building unoccupied special storage within 500 ft	-0.0208728	0.0239546	-0.87	0.384	-0.0678237	0.0260781
Count of Commercial building occupied industrial within 500 ft	0.0160618	0.0062204	2.58	0.010	0.0038697	0.0282538
Count of Commercial building unoccupied industrial within 500 ft	-0.0139648	0.0063174	-2.21	0.027	-0.0263469	-0.0015826
Count of Commercial building tax foreclosed within 500 ft	-0.017905	0.0103873	-1.72	0.085	-0.0382641	0.002454
Count of Commercial building mortgage foreclosed within 500 ft	0.0416571	0.0083017	5.02	0.000	0.0253857	0.0579285

Appendix 10 (continued):

Count of Commercial building land bank owned within 500 ft	-0.0466233	0.0175773	-2.65	0.008	-0.0810748	-0.0121718
Commercial occupied mixed use residential within 500 ft	0.0008118	0.0002409	3.37	0.001	0.0003396	0.001284
Commercial building unoccupied mixed use residential within 500 ft	0.0007678	0.0018695	0.41	0.681	-0.0028964	0.0044321
Commercial building occupied mixed use commercial within 500 ft	0.0003726	0.0006873	0.54	0.588	-0.0009745	0.0017197
Commercial building unoccupied mixed use commercial within 500 ft	0.0000406	0.0011573	0.04	0.972	-0.0022278	0.0023089
Sale 2011 quarter 1	-0.1508482	0.0247553	-6.09	0.000	-0.1993686	-0.1023278
Sale 2011 quarter 2	-0.0738549	0.0234896	-3.14	0.002	-0.1198946	-0.0278153
Sale 2011 quarter 3	-0.0396229	0.0240612	-1.65	0.100	-0.0867829	0.007537
Sale 2011 quarter 4	Omitted Sale Time-Period Control Indicator Variable					
Sale 2012 quarter 1	-0.0988085	0.0260494	-3.79	0.000	-0.1498653	-0.0477516
Sale 2012 quarter 2	0.0538332	0.024731	2.18	0.030	0.0053605	0.1023059
Sale 2012 quarter 3	0.0535775	0.0250303	2.14	0.032	0.0045181	0.1026369
Sale 2012 quarter 4	-0.019991	0.0256405	-0.78	0.436	-0.0702463	0.0302643
Sale 2013 quarter 1	-0.0050183	0.0257326	-0.2	0.845	-0.0554541	0.0454175
Sale 2013 quarter 2	0.1065016	0.0245267	4.34	0.000	0.0584294	0.1545739
Sale 2013 quarter 3	0.1333751	0.0241387	5.53	0.000	0.0860632	0.180687
Sale 2013 quarter 4	0.0785899	0.0250988	3.13	0.002	0.0293962	0.1277836
Sale 2014 quarter 1	-0.0771845	0.025776	-2.99	0.003	-0.1277054	-0.0266637
Sale 2014 quarter 2	0.157745	0.0241499	6.53	0.000	0.1104112	0.2050787
Sale 2014 quarter 3	0.1862931	0.0241703	7.71	0.000	0.1389194	0.2336669
Sale 2014 quarter 4	0.2000589	0.0253642	7.89	0.000	0.150345	0.2497727
Sale 2015 quarter 1	0.0948605	0.0256176	3.7	0.000	0.04465	0.145071
Sale 2015 quarter 2	0.2158037	0.0235414	9.17	0.000	0.1696625	0.2619449
Sale 2015 quarter 3	0.2148789	0.0237657	9.04	0.000	0.1682982	0.2614595
Sale 2015 quarter 4	0.218171	0.0238698	9.14	0.000	0.1713861	0.2649559
Sale 2016 quarter 1	0.1784884	0.0241661	7.39	0.000	0.1311229	0.2258539
Sale 2016 quarter 2	0.3218635	0.0229783	14.01	0.000	0.2768261	0.3669009
Sale 2016 quarter 3	0.3200466	0.0224011	14.29	0.000	0.2761405	0.3639527
Sale 2016 quarter 4	0.3131004	0.0227493	13.76	0.000	0.2685119	0.3576889
Sale 2017 quarter 1	0.281336	0.0231969	12.13	0.000	0.23587	0.326802
Sale 2017 quarter 2	0.4024565	0.022276	18.07	0.000	0.3587956	0.4461173
Sale 2017 quarter 3	0.4285272	0.022451	19.09	0.000	0.3845234	0.4725311
Sale 2017 quarter 4	0.441941	0.0227427	19.43	0.000	0.3973654	0.4865166
Natural Log of Sales Lag Spatial Autocorrelation Operator	0.3588376	0.0066642	53.85	0.000	0.3457758	0.3718995
MODEL CONSTANT	**6.805891**	**0.0758879**	**89.68**	**0.000**	**6.657151**	**6.954631**

Appendix 11: Commercial Hedonic Property Value Model - Final Specification

APPENDIX 11: COMMERCIAL HEDONIC PROPERTY VALUE MODEL – FINAL SPECIFICATION						
Number of Commercial Sales in Six Cities, 2011–2017	**3,846**					
Degrees of Freedom (90,3754)						
Prob > F	0					
R-squared	0.4907					
Root MSE	1.2609					
DEPENDENT VARIABLE: NATURAL LOG OF RESIDENTIAL SALES PRICE						
Independent Variables						
	Coefficient	**Standard Error**	**T-Value**	**P-Value**	**95% Confidence Interval**	
Key Independent Variables						
Natural Log of Total Investment Amount if Present and Within 1,000 Feet 1-Year or More Before Sale	0.0214284	0.0055439	3.87	0.000	0.0105591	0.0322977
Natural Log of Total Investment Amount if Present and Within 1,001-2,000 Feet 1-Year or More Before Sale	0.0103894	0.0048011	2.16	0.031	0.0009764	0.0198024
All Other Independent Control Variables						
1,000 Foot Control Dummy if Sales Property falls Within 1,000 Feet of an MEDC Investment Site	0.1201567	0.0695447	1.73	0.084	-0.0161924	0.2565059
1,000 Foot Control Dummy if Sales Property falls Within 1,001-2,000 Feet of an MEDC Investment Site	0.1891702	0.049058	3.86	0.000	0.0929873	0.2853532
Weak Submarket Indicator	-0.4697864	0.0726634	-6.47	0.000	-0.6122499	-0.3273228
Middle Submarket Indicator	Omitted Submarket Control Indicator Variable					
Strong Submarket Indicator	0.0809062	0.1506875	0.54	0.591	-0.2145311	0.3763435
City of Adrian Indicator	-0.686775	0.156246	-4.4	0.000	-0.9931103	-0.3804398
City of Alpena Indicator	-0.6579453	0.1787118	-3.68	0.000	-1.008327	-0.3075638
City of Detroit Indicator	-0.330144	0.0901946	-3.66	0.000	-0.5069792	-0.1533089
City of Grand Rapids Indicator	Omitted City-Level Control Indicator Variable					
City of Lansing Indicator	-0.2017229	0.0801403	-2.52	0.012	-0.3588456	-0.0446002
City of Marquette Indicator	-0.0703594	0.1699058	-0.41	0.679	-0.403476	0.2627572
Commercial Floor Square Footage Divided by 1,000	0.0057564	0.001185	4.86	0.000	0.0034332	0.0080797
Warranty Deed Sale Indicator	0.3193727	0.0611052	5.23	0.000	0.1995701	0.4391753
Quit Claim Deed Sale Indicator	-0.9922376	0.0786782	-12.61	0.000	-1.146494	-0.8379814
Sherriff's Deed (REO) Sale Indicator	-0.1579359	0.0895532	-1.76	0.078	-0.3335136	0.0176418
Age of Sold Property	-0.0103933	0.000837	-12.42	0.000	-0.0120343	-0.0087523
Unoccupied at Time of Sale Indicator	-0.3318987	0.1660531	-2	0.046	-0.6574618	-0.0063357
Tax Foreclosed at Time of Sale Indicator	-1.940829	0.7578397	-2.56	0.010	-3.426646	-0.4550111
Count of Owner occupied within 500 feet	-0.0012805	0.0011481	-1.12	0.265	-0.0035314	0.0009704
Count of Renter occupied within 500 feet	0.0001765	0.0015892	0.11	0.912	-0.0029392	0.0032923
Count of Unoccupied within 500 feet	-0.0156513	0.0049776	-3.14	0.002	-0.0254103	-0.0058923
Count of Residential buildings tax foreclosed within 500 feet	-0.016177	0.0088959	-1.82	0.069	-0.0336183	0.0012643

Appendix 11 (continued):

Count of Residential buildings mortgage foreclosed unoccupied within 500 feet	-0.0205871	0.02546	-0.81	0.419	-0.0705038	0.0293297
Count of Residential buildings mortgage foreclosed occupied within 500 feet	-0.0166909	0.0353264	-0.47	0.637	-0.0859517	0.0525699
Count of Residential buildings land bank owned within 500 feet	-0.0108859	0.0038764	-2.81	0.005	-0.0184859	-0.0032859
Count of Vacant lot residential within 500 feet	0.0242313	0.0157399	1.54	0.124	-0.0066282	0.0550909
Commercial occupied retail at Time of Sale Indicator	0.2109535	0.0366591	5.75	0.000	0.1390799	0.2828271
Commercial unoccupied retail	-0.3744114	0.0641957	-5.83	0.000	-0.5002732	-0.2485496
Commercial occupied office	-0.0003781	0.0258658	-0.01	0.988	-0.0510905	0.0503342
Commercial unoccupied office	-0.0249933	0.0613825	-0.41	0.684	-0.1453397	0.095353
Commercial occupied hotel	-0.029443	0.0295502	-1	0.319	-0.087379	0.0284931
Commercial unoccupied hotel	1.847647	0.1564099	11.81	0.000	1.540991	2.154304
Commercial occupied multi-family	0.0218051	0.004902	4.45	0.000	0.0121942	0.031416
Commercial unoccupied multi-family	-0.0028371	0.0088795	-0.32	0.749	-0.0202461	0.014572
Commercial occupied special customer	-0.1864093	0.1374348	-1.36	0.175	-0.4558633	0.0830448
Commercial unoccupied special customer	-0.6361839	0.219446	-2.9	0.004	-1.066429	-0.2059389
Commercial occupied special storage	-0.1768091	0.1330107	-1.33	0.184	-0.4375894	0.0839713
Commercial unoccupied special storage	-0.5951538	0.2272088	-2.62	0.009	-1.040619	-0.1496891
Commercial occupied industrial	-0.0941406	0.0826018	-1.14	0.254	-0.2560893	0.0678082
Commercial unoccupied industrial	-0.1187703	0.1262547	-0.94	0.347	-0.3663047	0.1287642
Commercial building tax foreclosed	-0.8742518	0.1415644	-6.18	0.000	-1.151802	-0.5967011
Count of Commercial occupied retail within 500 ft	0.0003422	0.0020013	0.17	0.864	-0.0035816	0.0042659
Count of Commercial unoccupied retail within 500 ft	-0.0005742	0.0077044	-0.07	0.941	-0.0156794	0.014531
Count of Vacant lot other within 500 ft	0.0023587	0.0054544	0.43	0.665	-0.0083351	0.0130525
Count of Commercial building occupied office within 500 ft	0.0029083	0.00306	0.95	0.342	-0.0030911	0.0089078
Count of Commercial building unoccupied office within 500 ft	-0.0007624	0.0090422	-0.08	0.933	-0.0184905	0.0169658
Count of Commercial building occupied hotel within 500 ft	0.0050166	0.0048006	1.05	0.296	-0.0043953	0.0144286
Count of Commercial building unoccupied hotel within 500 ft	-0.0175276	0.0085129	-2.06	0.040	-0.0342179	-0.0008373
Count of Commercial building occupied multi-family within 500 ft	0.0014906	0.0005398	2.76	0.006	0.0004322	0.0025489
Count of Commercial building unoccupied multi-family within 500 ft	0.0067449	0.002857	2.36	0.018	0.0011434	0.0123463
Count of Commercial building occupied special customer within 500 ft	-0.0476463	0.026714	-1.78	0.075	-0.1000216	0.0047291
Count of Commercial unoccupied special customer within 500 ft	-0.063604	0.0531818	-1.2	0.232	-0.1678721	0.040664
Count of Commercial building occupied special storage within 500 ft	-0.006645	0.0275335	-0.24	0.809	-0.0606271	0.047337
Count of Commercial building unoccupied special storage with 500 ft	-0.0045467	0.0830982	-0.05	0.956	-0.1674686	0.1583753
Count of Commercial building occupied industrial within 500 ft	0.0049403	0.0045223	1.09	0.275	-0.0039261	0.0138067
Count of Commercial building unoccupied industrial within 500 ft	0.0008347	0.0242034	0.03	0.972	-0.0466184	0.0482878

Appendix 11 (continued):

Count of Commercial building tax foreclosed within 500 ft	-0.0876379	0.0315024	-2.78	0.005	-0.1494015	-0.0258744
Count of Commercial building mortgage foreclosed within 500 ft	-0.1518033	0.0683546	-2.22	0.026	-0.2858191	-0.0177874
Count of Commercial building land bank owned within 500 ft	-0.0422605	0.0429724	-0.98	0.325	-0.126512	0.0419911
Commercial occupied mixed use residential within 500 ft	0.0034963	0.0011887	2.94	0.003	0.0011657	0.0058268
Commercial building unoccupied mixed use residential within 500 ft	-0.0017905	0.0062872	-0.28	0.776	-0.0141171	0.0105362
Commercial building occupied mixed use commercial within 500 ft	0.0045305	0.0028581	1.59	0.113	-0.001073	0.010134
Commercial building unoccupied mixed use commercial within 500 ft	-0.0203817	0.0035042	-5.82	0.000	-0.027252	-0.0135114
Sale 2011 quarter 1	0.0350568	0.219124	0.16	0.873	-0.3945568	0.4646705
Sale 2011 quarter 2		0 (omitted)				
Sale 2011 quarter 3	0.1770821	0.2226332	0.8	0.426	-0.2594118	0.613576
Sale 2011 quarter 4	0.0021075	0.1940915	0.01	0.991	-0.3784276	0.3826425
Sale 2012 quarter 1	0.225003	0.2005895	1.12	0.262	-0.168272	0.618278
Sale 2012 quarter 2	0.2286503	0.2117669	1.08	0.280	-0.186539	0.6438396
Sale 2012 quarter 3	0.1611246	0.220762	0.73	0.466	-0.2717006	0.5939499
Sale 2012 quarter 4	0.4067129	0.203664	2	0.046	0.0074101	0.8060157
Sale 2013 quarter 1	0.1078586	0.2112917	0.51	0.610	-0.3063991	0.5221164
Sale 2013 quarter 2	0.2406323	0.20498	1.17	0.240	-0.1612507	0.6425152
Sale 2013 quarter 3	0.4741886	0.207763	2.28	0.023	0.0668492	0.881528
Sale 2013 quarter 4	0.5320042	0.2058682	2.58	0.010	0.1283798	0.9356286
Sale 2014 quarter 1	-0.101663	0.2028271	-0.5	0.616	-0.499325	0.295999
Sale 2014 quarter 2	0.0525426	0.1932333	0.27	0.786	-0.3263098	0.431395
Sale 2014 quarter 3	0.1661216	0.1883117	0.88	0.378	-0.2030816	0.5353248
Sale 2014 quarter 4	0.1858639	0.1955819	0.95	0.342	-0.1975933	0.569321
Sale 2015 quarter 1	0.1868574	0.1959035	0.95	0.340	-0.1972302	0.5709451
Sale 2015 quarter 2	0.0915916	0.1933854	0.47	0.636	-0.2875592	0.4707423
Sale 2015 quarter 3	0.4556813	0.1981678	2.3	0.022	0.0671544	0.8442082
Sale 2015 quarter 4	0.3925076	0.1931572	2.03	0.042	0.0138044	0.7712109
Sale 2016 quarter 1	0.3125583	0.1881624	1.66	0.097	-0.0563523	0.6814688
Sale 2016 quarter 2	0.2366859	0.1952313	1.21	0.225	-0.1460839	0.6194557
Sale 2016 quarter 3	0.5157486	0.1983155	2.6	0.009	0.1269319	0.9045652
Sale 2016 quarter 4	0.5334495	0.1946307	2.74	0.006	0.1518574	0.9150416
Sale 2017 quarter 1	0.4317877	0.1976054	2.19	0.029	0.0443633	0.8192121
Sale 2017 quarter 2	0.561042	0.1893288	2.96	0.003	0.1898446	0.9322393
Sale 2017 quarter 3	0.4625124	0.1936526	2.39	0.017	0.0828379	0.8421869
Sale 2017 quarter 4	0.52017	0.1887498	2.76	0.006	0.1501078	0.8902322
Natural Log of Sales Lag Spatial Autocorrelation Operator	0.2313115	0.0230947	10.02	0.000	0.186032	0.2765909
MODEL CONSTANT	**9.738394**	**0.3515259**	**27.7**	**0.000**	**9.049194**	**10.42759**

Appendix 12: Method of Transforming Key Variable Coefficients in Final Hedonic Model Specifications into Property Value Impact Multipliers (PVIMs) for Property Value Impact Analysis

Method of Transforming Results from Final Model Specifications into Impact Multipliers

DEFINITIONS:

i represents individual properties

c represents a type of market cluster

b represents a distance band

icb subscripts represent a property **i** in band **b** of cluster type **c**

$\mathbf{P_i}$ = price or property value

$\hat{\boldsymbol{P}}_i$ = predicted price

$\mathbf{I_i}$ = investment made over one year before sale of property **i** in band **b** with type **c**

$\mathbf{X_i}$ = other characteristics of property and surrounding area (covariates)

$\boldsymbol{\beta_{ibc}}$ is the parameter to be estimated for the investment effect in band **b** around property **i** of type **c**

$\boldsymbol{\alpha}$ is the parameter to be estimated for other characteristics of property and area

THE GENERAL FORM OF THE REGRESSION EQUATION WAS:

$$ln(\hat{P}_i) = \sum_b \beta_{ibc} ln(I_{icb}) + \alpha X_i$$

where Σ represents the summation operator. Thus, the predicted price is

$$\hat{P}_i = \prod_b exp\left(\beta_{ibc} ln(I_{icb})\right) \times exp(\alpha X_i)$$

Which can be simplified to the following due to some algebra with exponents and logarithms:

$$\hat{P}_i = \prod_b {I_{icb}}^{\beta_{ibc}} \times exp(\alpha X_i)$$

where Π represents the product operator. To predict a particular property's price in the baseline data used in the regression, use the above formula.

To do counterfactuals, consider the following results. Let Pi1 be the predicted price if i has investments nearby and let Pi0 be the predicted price in the counterfactual situation with no investments nearby. Then

$$\frac{\hat{P}_i^{\,1}}{\hat{P}_i^{\,0}} = \frac{\prod_b {I_{icb}}^{\beta_{ibc}} \times exp(\alpha X_i)}{exp(\alpha X_i)} = \prod_b {I_{icb}}^{\beta_{ibc}}$$

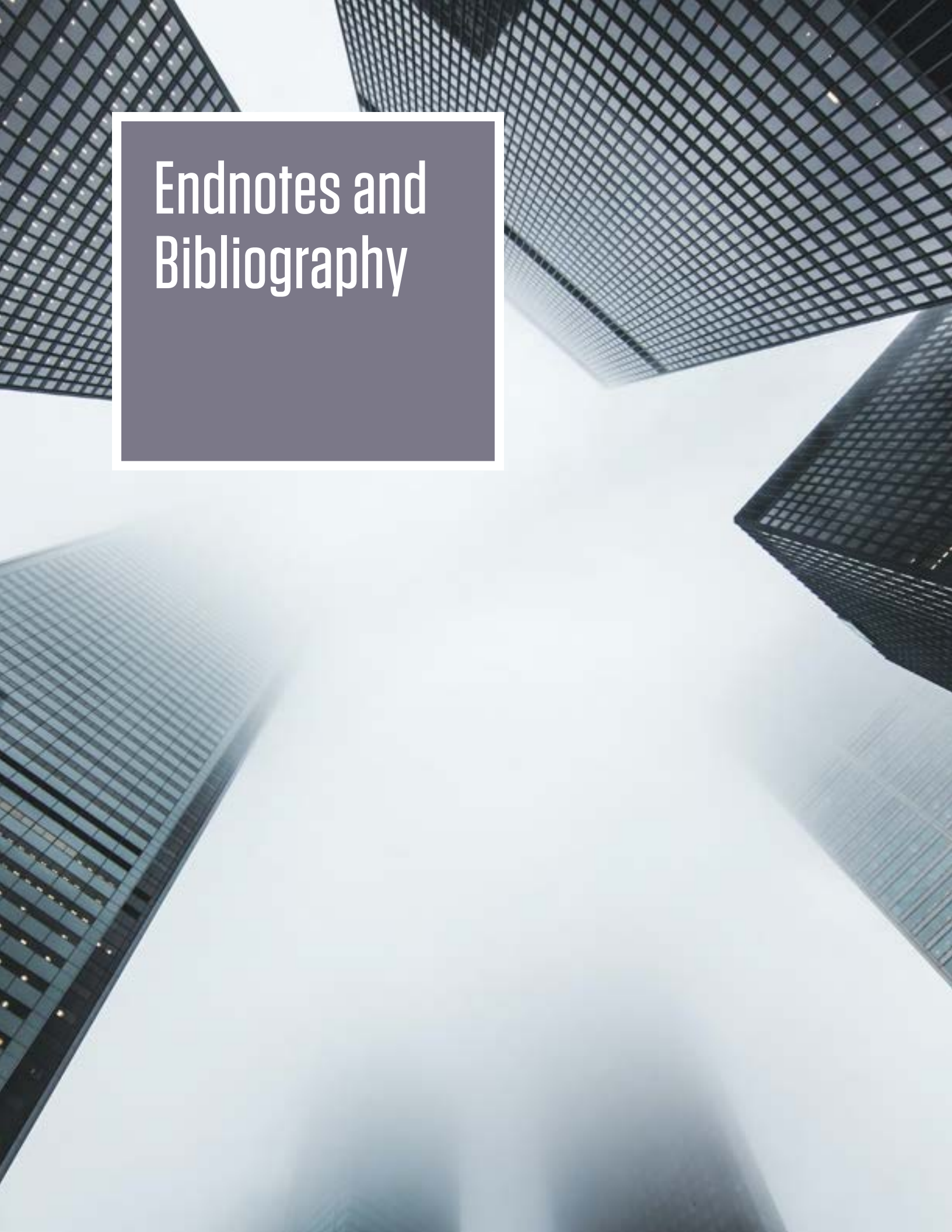
or restating this as a "multiplier" on the price without investment

$$\hat{P}_i^{\,1} = \hat{P}_i^{\,0} \times \prod_b {I_{icb}}^{\beta_{ibc}}$$

For this reason, for an individual property, the terms ${I_{icb}}^{\beta ibc}$ are in essence the multipliers on that property's value due to nearby investments.

Appendix 13: Final Difference-in-Differences Model Specification Results of Occupancy Rate Impacts from MEDC CDI Investments

APPENDIX 13: IMPACT ON OCCUPANCY RATES WITHIN 1,000 FEET OF MEDC COMMUNITY DEVELOPMENT INCENTIVES INVESTMENTS, 2011–2017		
Submarket	**Residential**	**Commercial**
Six-City Wide	2.90%	3.22%
Weak Market	2.63%	--
Middle Market	2.34%	--
Strong Market	--	--
*Interpreted as % change in the occupancy rate when building are near MEDC investment.		



Endnotes and Bibliography

Endnotes

1. “Deals” in this report refer to the commencement of an MEDC CDI project financed by one or more CDI Program in combination with private investment. The overall average deal size in this study is approximately $10 million, with MEDC investing around $2 million and outside entities investing approximately $8 million per deal. The exception to the rule is the PSCP program, which is a community-driven match program with much lower investment requirements to meet program objectives. See Appendix 5 for details.

2. The impacts of 542 MEDC CDI deals performed between 2008–2019 (the “study period) that were quantified in this study. The “empirical analysis time period” for the study is 2011–2017 and represents the time frame when a comprehensive property-level time-series panel data set was available to perform econometric analysis. This was due to city-level and property-level time-series data availability constraints. Findings from the empirical analysis time period were applied to all MEDC CDI deals outside that time period (2008–2010 and 2018–2019) to attain comprehensive impact estimates during the full study period.

3. See the “Applying Benefit-cost Ratios and Property Value Impact Multipliers” section on page 57 for further discussion on the trade offs of using PVIMs and BCRs for predictive impact analysis.

4, 5. http://www.stateincentives.org/

6. See the “Approach” section on page 70 for further explanation of the hedonic and difference-in-differences methods.

7. See Appendix 4 and 5 on page 75 for detailed spending by program.

8. https://www.michiganbusiness.org/about-medc/michigan-strategic-fund/

9. U.S. Department of Housing and Urban Development definition of entitlement community: Entitlement communities develop their own programs and funding priorities. However, grantees must give maximum feasible priority to activities which benefit low- and moderate-income persons. A grantee may also carry out activities which aid in the prevention or elimination of slums or blight. Additionally, grantees may fund activities when the grantee certifies that the activities meet other community development needs having a particular urgency because existing conditions pose a serious and immediate threat to the health or welfare of the community where other financial resources are not available to meet such needs. CDBG funds may not be used for activities which do not meet one of these national objectives.

10. http://www.remi.com/model/pi

11. See an “Economic and Fiscal Impact Assessment of the Transformational Brownfield Plan Submitted by Bedrock Management Services, LLC”, pp.10-11, 22.

12. Id at p.22; for a more full description of the hedonic method, see page 331 of Champ et al., 2003: https://www.springer.com/gp/book/9781402014451

13. See https://www.miplace.org/globalassets/documents/cd_guidance.pdf

14. See https://www.michigan.gov/documents/openmichigan/MEDC_May_2019_Scorecard_624269_7.pdf

15. See the “Approach” section on page 70.

16 – 22. This counterfactual valuation—that the property values would have been less had the CDI Deals not occurred—would be effective on December 31, 2017 (the end of the empirical study period). It may be logically inferred that this value change for the better effectuated by the CDI deals would carry forward to the present day.

23. See Bibliography e, pages 13–14.

Endnotes

24. See “Approach Section” for details on the DID method.

25. See Appendix 3 for details.

26. See Bibliography m.

27. See Appendix 12 for details.

28. See “Afterword: Overcoming Limitations to Hedonic Power,” Decision Support for Property Intervention: Rehab Impacts in Greater Cleveland, 2009-2015, pp. 32-33 (Dynamno Metrics, LLC 2016), available at https://static1.squarespace.com/static/5650fa1de4b02fdfadb21b3e/t/5e3b03d21708cc3728054689/1580925952161/rehab-impacts-cleveland_dynamo-metrics.pdf.

29. Residential and commercial calculations were quantified differently because residential application of findings was necessary statewide given residential data existed statewide, and a statewide calculation was possible, thus requiring a consistent method that did not require parcel level intelligence outside the six cities was required for the residential calculation. The method chosen was to evenly distribute counts of residential properties within each census tract, thus not mirroring the exact reality of spatial distribution when quantifying statewide residential results. When compared to actual results in our six cities, it was recognized that the actual impact amount was approximately 40% on average lower than the standardized method. Thus, all statewide and six city residential impact calculations received a 40% reduction across the board to assure a conservative impact estimate.

30. See Bibliography a.

31. The three submarkets are the outcome of the second stage k-means (see bibliography t) of Dynamo’s two-stage multivariate cluster analysis method. These are averaged summary statistics of Census Tract-level variables within each of the 3 identified submarket clusters across the State of Michigan. The 3-cluster results represented the optimal distribution of housing submarkets for a well specified hedonic pricing model given available data.

32. These are the loadings that were used to create predicted values for each of the principal components that when aggregated and applied across Michigan equate to greater than 50% of the variation of all variables that were used in the statewide principal components analysis (PCA). For a deeper conversation of Dynamo’s use of PCA see bibliography u.

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