#### **Project Abstract**

# Value Densification – a focus on investment and development in neighborhoods and districts where inhabitation, infrastructure, cultural and employment assets [and value] are in evidence.

The goal of the Value Densification Community Mapping Project (VDCmp) is to build on Phase I results and continue to explore how aspects of the post-industrial city can be understood, communicated, and leveraged in service of equity and sustainability, and to use technology to reveal data about the city in order to convince community, political, and economic leadership to embrace a broader interpretation of value. Our primary intent is to prompt a new way of interpreting, illustrating, and leveraging distinctly urban assets and, in doing so, positively influence future urban form. A diverse team of architects, urbanists, planners, and civil engineers are collaborating to create a unique "free-ware" digital interface utilizing Google Earth, Sketch Up, and ERSI ArcGIS to model both physical and social density utilizing a variety of data sets in Southwest Detroit, MI, USA - a vibrant neighborhood that is currently transforming socially, physically, and economically. The resultant digital interface empowers the community through asset identification and creation of an accessible tool to assist in envisioning its environmental, social, and economic future. The VDC digital interface is unique in that it models "social exchanges" in three dimensions, and allows the user to overlay social and infrastructure layers with physical density.

In 2008, with funding from the AIA and LISC, the VDCmp expanded the Research Team and continued to engage the nonprofit groups in Southwest Detroit as community client to determine how they can best utilize data and mapping as planning, design, development, and evaluative tools. The focus of Phase II has been on creating a comprehensive tool that can support community design and development policy decisions. Community members have become active partners in evolving the digital interface as a tool for strategic planning at the agency/organization, coalition, city and regional levels.

The VDCmp research methodology has five primary areas of focus: Establishing a process to bring partners to the table; Data collection and review; Enhancing the digital interface; Design + Density Recommendations; Training, analysis and application. Project Outcomes in Phase II include: Augmentation of a digital interface that is readily available to community organizations, governmental entities, researchers, students and other interested parties; Increasing capacity of community organizations to develop strategic community development plans that in turn, have short- and long-term feasibility; Ongoing research and pedagogic goals.

#### AIA RFP 2008 - Research Report: Value Densification Community Mapping Project

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Value: "the regard that something is held to deserve: importance or worth."

ORIGIN ME: from OFr., fem. past part. Of *valoir* 'be worth', from L. *valere. Oxford English Dictionary, Eleventh Edition, 2004* 

#### Background

The Value Densification Community Mapping Project (VDCmp) is based on the primary author's life-long investigation of Detroit: perhaps the most acute manifestation of a shared urban condition in our post-Fordist, post-industrial world. For our purposes, however, Detroit is a City of *worth*.

As urbanists, we are interested in the future of urban form. Fundamentally, we believe that the City should be the most desirable location for human habitation: beautiful, equitable, and sustainable. In our current research, which is just beginning to make form-based recommendations, our emphasis is initially on the latter. Given the urban context or our research, we believe that a collective civic dialogue on balancing growth, equity, and sustainability is necessary: where and how will we redevelop (densify) and support resident populations with capacity, services, and investment? How can aspects of the post-industrial city be understood, communicated, and leveraged in service of equity and sustainability? We wish to reveal data about pieces of the city in order to convince community, political, and economic leadership to embrace a broader interpretation of value. This broader interpretation subsumes the economic and elevates human [inhabitation], cultural [place] and infrastructure [ecosystem] value<sup>i</sup>. Each criterion is purposely chosen:

**human** [inhabitation] : post-industrial cities such as Detroit are often characterized by significant population loss. However, Detroit does have neighborhoods that are characterized by stable, even growing populations. Concentrations of inhabitation serve as the primary criteria.

**cultural [place]** – post-industrial cities have layers of both built and narrative heritage (continuum). Concentrations of such resources and embedded meaning become the second criteria.

infrastructure [ecosystem] postindustrial cities are rich with investment in physical and technological infrastructure that supports the manufacturing and movement of goods and services and the human settlement associated with these activities. This infrastructure defines the natural and built eco-system of the City. We employ an expansive interpretation of infrastructure as "Blue, Green, and Gray": Green infrastructure describes both natural flora and fauna and their related habitats, and also man-made landscape and greenway networks and the increasing emphasis and presence of LEED (and other sustainability criteria-based systems) rated buildings and neighborhoods. Blue infrastructure describes the watersheds, floodplains, wetlands, hydrology, water+sewer infrastructure on and near which industry (and resultant residential and commercial districts) is typically located.



Gray infrastructure is entirely man-made, including highways, roads, rails, digital and other surface and sub-surface systems along with the environmental impacts generated by such, including impervious surfaces, surface run off and storm water, air quality, average daily traffic, toxic release, et al.

Of course each of these criteria have been, and continue to be, of importance to location and therefore to conventional real estate and economic value (we operate, after all, in a capitalist system). What we believe to be unique in the "value densification" approach is the suggestion that our design processes begin with this new triumphrite of value. In order to make value [assets] and the concentration of value more easily understandable and accessible to community and decision makers, we convey this expanded notion of value as visualization of density in three dimensions. Certainly aspects of the built environment are typically conveyed in this manner, but we believe our attempts to document and convey the density and energy of social and cultural values and capacity, is a newer approach that few (if any) have employed.

We ask in our research: if we collectively accept inhabitation, cultural, and infrastructure value as fundamental criteria in our future urban

design investigations and interventions, how would it change the face of urban form? The mapping of our Cities? Decisions for the concentration of resources, services, and capacity? Location of future investment, and therefore, density? What are the implications for the future of urban form? The "value densification" approach attempts to address all of these questions, and in doing so, empower the community to make more equitable and sustainable decisions. Our primary intent is to prompt a new way of interpreting, illustrating, and leveraging distinctly urban assets and, in doing so, positively influence future urban form. We believe that the key to Regional Detroit's future (and that of other post industrial cities and regions) is a commitment to a collective dialogue about priorities around concentration of investment and development. The answer to this question of priorities, in our opinion, is a focus on the districts and neighborhoods of our cities where residents are concentrated, in addition to the current strategy of focusing on downtown and riverfront districts. These neighborhoods not only have passionate and committed residents, but infrastructure and cultural value that could catalyze regional regeneration. This strategy implies a very different urban form than we have had in the 20th century, but perhaps a more sustainable and hopeful one.

#### Density = <u>mass</u> volume

Density: n. 1 the degree of compactness of a substance. 2 the quantity of people or things in a given area or space.

ORIGIN C17: from Fr., densite or L. densitas, from densus 'dense'.

Oxford English Dictionary, Eleventh Edition, 2004

## Theory + Analysis

Much has been published in the post-modern era extolling the theoretical, conceptual, and practical virtues of density. Jane Jacobs began the argument in the 1960s with her incisive criticism of modernism and its impact on the physical and social fabric of



Value Densification : recommended Plot Community Projects (green circles from left to right): Southwest Detroit, North End, Glengarry Marentette-Windson figure excerpted from +D IND DEV: Industrial Spatial Logic and the Transformation of the City, by Constance C. Bodurow, 2006, all rights reserved. North American cities<sup>ii</sup>. After languishing during decades of unabated urban sprawl, Rem Koolhaas revived the focus on the center city, and praised Manhattan's density and the desirable "culture of congestion" that it generates<sup>iii</sup>. More recently, urbanists such as Winy Maas have focused on the complexity of the city and have promoted density (especially in cities experiencing exponential growth) as a way to address contemporary global ecological and quality of life challenges. More mainstream endorsements from the Congress for New Urbanism, proponents of transit-oriented development (TOD), the American Institute of Architects<sup>iv</sup>, and the Urban Land Institute - identify density as a viable alternative to urban sprawl, generating increased livability and sustainability in urban areas. However, the majority of these theoreticians and practitioners have focused solely on the built environment. Only urbanist Teddy Cruz has suggested, based on the strict and limited interpretation of urban density as massing Floor Area Ratio (FAR) at the 2006 Venice Biennale, that we must begin to examine the density of "social exchanges"<sup>v</sup> as a way of understanding and analyzing the complexity of the City.

The primary author agrees with both the current theoretical and practical schools of density, but wished to expand the dialogue through design research. An alternative regeneration strategy for the future of urban form, inspired by this research and analysis, argues that density is still possible in the Post-Industrial City. This expanded dialogue challenges the assumption that a globalized economy dictates dispersed urban from, and argue that balanced, equitable, sustainable, dense, and urbane development is still possible, and by doing so, proposes a new approach to (and definition of) urban density:

**Value Densification** – a focus on investment and development in neighborhoods and districts where inhabitation, infrastructure, cultural and employment assets [and value] are in evidence<sup>vi</sup>.

The primary author identified this term at the conclusion of previously peer reviewed and disseminated research<sup>vii</sup>. Bodurow concludes that future policy and legislation should identify and document areas of the region that meet "value densification" criteria, and develop programs to support future investment in these areas. Public and private sector cooperation can focus on Regional Detroit's core - the neighborhoods that are in proximity to job centers, growing populations, blue, green, and gray infrastructure, recreational resources, and sites and buildings that provide opportunity for both adaptive reuse and new construction. Foci and opportunities are identified through proximity to continued (expanded) "places of making"viii and a diverse interpretation of value inhabitation, infrastructure, and cultural. Such areas in Regional Detroit include Southwest Detroit, the North End/Hamtramck, and Glengarry Marentette in Windsor. However, the approach, methodology and the digital interface described here is replicable and can be used across the global post-industrial landscape. Southwest Detroit is in particular an excellent example of such a district, and was therefore identified as the initial "value densification" community for the pilot project. The neighborhood is characterized by new immigration and population growth, a cogent cultural heritage, and longstanding, effective community-based development organizations. Southwest Detroit also contains large employment centers, is rich in "Blue, Green, and Gray" infrastructure, and cultural and historic sites.



#### Approach:

To translate the theoretical direction of "value densification" into a design research methodology, Primary Author the appropriate considered design and communication technologies to emulate (through digital (virtual) reality), the physical and geographic conditions of the "real world". Our design research required the manipulation and portrayal of data in graphic form and within а digital environment over time. Diverse data infrastructure (human, cultural, value) required communication through spatial analysis, mapping, and visualization, both for evaluation and prediction of future geographies and environments. We evaluated multifarious tools for the visualization of "digital geography" and geo-spatial analysis as well as tools for modeling the complexity, density, and ever changing state of the urban condition. A fundamental goal was to model data in three dimensions. Geographic Information System (GIS) software allows for the management, analysis, and two dimensional visualization of geographic information, but did not fully satisfy<sup>1x</sup>. GIS technology did satisfy a secondary goal of utilizing existing data sets and documenting the meta- and geo- data in a centralized, interactive, and accessible location. GIS supports geo-coding of all manner of data by point, line, and/or polygon, and then, through correlation assumptions, can generate network and systems diagrams. GIS also allows for organizing and graphically arraying data within geographic boundaries – both conventional (census tracts) and culturally-defined (neighborhoods).

Numerous sophisticated software platforms are available for modeling the built and natural environments in three and four (time) dimensions. Few, with the exception of BIM software, allow for interactivity with other data and digital environments. Sketch Up, while graphically simplistic, allows for modeling the built environment and then viewing simulations "in situ" within its companion software Google Earth - a program that allows one to explore the world by "flying" around and then zooming in on geography of interest. The imagery in Google Earth ranges from a few weeks to 4 years old, but is constantly updated<sup>x</sup>. With an ultimate goal of public and community (non-technical) accessibility, the egalitarian access and ease of use of the Google platform appealed. The ability to model both physical and social data in either Sketch Up or GIS, then import a compressed file format for use and viewing within the virtual reality of Google Earth imagery, made the platform the logical choice our digital interface<sup>xi</sup>.

To inform our design research, we continually seek academic peers and design practitioners who are addressing urban density, the future of urban form (and visualization of such futures) through spatial and urban analysis using digital technology. Urbanists such as Winy Mass and Michael Batty<sup>xii</sup> have created proprietary digital modeling technologies to examine density, digital geography, multifarious urban data sets, and generate impacts based on alternate scenarios of choice<sup>xiii</sup>. We have ongoing interest in the work of other academic colleagues generating similar work in both North American and international Schools of Architecture, and hope to convene a symposium in Detroit at a future date<sup>xiv</sup>. Frustrated with the graphic limitations of our "freeware" interface, we have begun a review of excellent precedents of graphic expression for the communication of urban and social density and data and spatial analysis<sup>xv</sup>.



#### **Project Context:**

Our research context is Regional Detroit, which transforming is its post-Industrialpost-Fordist cultural landscape and economy through an emergent, yet highly subsidized, development economy. To date, civic leaders have employed a conventional re-development strategy, focusing on the Lower Woodward Corridor and East Riverfront, leaving the City's neighborhoods varying to levels of community development capacity. Landscape Urbanism and Shrinking Cities proponents identify Detroit's abandonment as its primary asset and argue that a globalized economy dictates dispersed urban form. This Research Team argues that a balanced, sustainable, dense, and urbane form is still possible, based on an analysis of Detroit's development and spatial legacy, and guided by a broader interpretation of value.

#### **Study Area:**

Southwest Detroit is (and has been) a vibrant piece of Regional Detroit, and is currently transforming socially, physically and economically. The 12,450 acre, 19.45 square mile neighborhood is located on the Detroit River, the international border with Canada, and at the junction of major highway and rail infrastructure. The neighborhood's geography has defined its heritage and, to some extent, its future, as a critical regional transportation hub. The Port of Detroit, the Ambassador Bridge to Canada and other major regional transportation infrastructure is located within neighborhood boundaries. Because of this, the neighborhood has experienced a disproportionate amount of regional infrastructure investment, and is currently the location of several massive scale infrastructure projects, including the Detroit River International Crossing (DRIC), the Detroit Intermodal Freight Terminal (DIFT), the Detroit International Bridge Crossing (DIBC) and Gateway project for the Ambassador Bridge<sup>xvi</sup>. Like most of the Region, the Southwest neighborhood experienced explosive growth in the early to mid 20th century prompted by immigration for high wage auto jobs and declined with the consolidation and downsizing of the industry. Remnants of its vast industrial heritage are still intact and functioning within and adjacent to its boundaries (Ford Rouge Plant, Severstal Steel, National Steel, La Farge Cement, etc.). Currently, Southwest Detroit is enjoying another immigration boom, and is the only neighborhood in the city that is adding population, due largely to its growing Hispanic population. Southwest is also the most diverse neighborhood in Detroit, with a demographic profile that includes African American, Hispanic, Arabic and white ethnic groups<sup>xvii</sup>. Because of this growth and diversity, Southwest Detroit enjoys a vibrant commercial base, centered on the West Vernor Highway, Fort Street, and Michigan Avenue commercial corridors. The community is served by highly skilled advocacy and development organizations, twenty plus of which recently organized under the umbrella organization of the Southwest Detroit Development Collaborative (SDDC). SDDC members are currently engaged in the provision of diverse social services and large scale planning initiatives (both in their own and others' control), for infrastructure, housing, greenways and other community amenities.

employed for the VDCmp has five primary areas of focus:

- Establishing a process to bring partners to the table;
- Data collection and review;
- Enhancing the digital interface;
- Design + Density Recommendations
- Training, analysis and application.

To date, project outcomes include:

• Augmentation of a digital interface with input from the community client. The digital interface has been loaded with current data sets as identified by the research team and SDDC, including, geographic boundaries, demographic and economic data, historic and cultural assets, parkway and greenway projects, proposed commercial development, new housing projects, education, energy usage, public health, the scale of the informal economy, etc. Our ultimate goal is that the digital interface will be readily available to community organizations, governmental entities, researchers, students and other interested parties.

• Increased capacity of community organizations to develop strategic community development plans that in turn, have short- and long-term feasibility. To date, members of community client have been able to see how their own work impacts, and is impacted by, others working in the area. The community is excited about the ability to readily download and manipulate data to produce 3D maps. Our ultimate goal is that other planning agencies at the city, county, regional, and state level will be able to use the digital interface, and eventually (and hopefully), other neighborhoods of Detroit, and Cities throughout North America.

• Ongoing research and pedagogic goals are being met. The project has provided rich collaborative academic and practice opportunities – between universities, design disciplines, university and community, faculty and practice colleagues and students. During Phase II, additional Research Team partners have been engaged. The project has supported integration of research, outreach, and technology into the Primary Author's architectural design studio pedagogy<sup>xviii</sup>. As designers, we hope that the project will prompt a collective civic dialogue on balancing growth, equity, and sustainability.

As designers, we hope that the project will prompt a collective civic dialogue on balancing growth, equity, and sustainability. By illustrating physical and social density and making recommendations for land use planning, urban design, and future architectural projects and investments, we hope to generate compelling visual alternatives for future urban form.

#### **Research Methodology**

To insure that the digital interface will allow both community and academic users to easily interpret the data that is being mapped, we selected Google Earth | Sketchup | ArcView (GIS) to create the digital interface to insure that users without any special technical knowledge would be able to independently engage the research in a meaningful way. The research methodology



## Value Densification Community Pilot Project (VDCpp)

During the summer of 2007, a research team led by the Primary Author, through partial funding from a University of Detroit Mercy (UDM) faculty grant, mounted an urban design research project titled Value Densification Community pilot project (VDCpp). The group included colleagues in Architecture, Urbanism, and Civil Engineering as research partners, architecture students as Research Assistants, and continued an urban design collaboration between the UDM School of Architecture and Warsaw Polytechnica University School of Architecture. The project engaged the Southwest Detroit Development Collaborative (SDDC) comprised of community development corporations (CDCs) and human service organizations working in Southwest Detroit. The pilot project (Phase I) focused on a targeted area within Southwest Detroit bounded by Wyoming (west), the Detroit River (south), the Lodge Freeway (east) and Michigan Avenue (north). The study area was agreed upon by participating SDDC members.

The goal of Phase I was to create a three dimensional (3D) digital interface (model and data base) that would become a powerful tool for measuring, illustrating and envisioning three dimensional density and empower the community in developing assets while also envisioning their social, environmental and economic future. The resultant digital interface was unique in that it modeled "social exchanges" in three dimensions, and allows the user to overlay diverse metrics illustrating social and infrastructure assets with physical density.

In Phase I, the scope of work was largely focused on data gathering and creating the digital interface. The Research Team did create the initial "free-ware" digital interface utilizing Google Earth, Sketch Up, and ESRI ArcGIS to model both physical and social density utilizing a variety of existing data sets. Ultimately, it was hoped that the pilot project would provide the framework for a comprehensive database with a digital interface that would be readily accessible by community organizations, business groups, residents, students/faculty at universities and other interested parties. For this reason Google Earth software was chosen as it is available to anyone free of charge and requires a minimum of technical assistance to use. Primary data sets for the pilot project came from public sources such as the US Census and the SDDC's own documentation of projects and investment within the study area<sup>xix</sup>.

Even with the limited funding and short time period of the pilot project (May – August 2007), the team was struck by both the richness of the data collected and the infinite possibilities of layering such data made possible with the digital interface. For example, the team was able to

initiate a series of layers on assets: population, land use and housing and employment. Not only were future investment areas outlined, but potential conflicts were revealed as well. In another example, one of the alternatives proposed for the Detroit River International Crossing (DRIC) precluded a plan to develop the Livernois/Dragoon corridor to the Detroit river.

#### Phase II Scope of Work:

The primary goal of Phase II (the VDCmp) is to explore how aspects of the post-industrial city can be understood, communicated, and leveraged in service of equity and sustainability, and to use technology to reveal data about the city in order to convince community, political, and economic leadership to embrace a broader interpretation of value. Through generous funding from the American Institute of Architects (AIA) Research for Practice (RFP) grant program, and Local Initiatives Support Corporation (LISC), the Research Team has been able to advance our work with the SDDC (Community Client). The resultant digital interface empowers the community through asset identification and creation of an accessible tool to assist in envisioning its environmental, social, and economic future. The enhanced digital interface captures and illustrates community assets through two measures of density:

Physical : Floor Area Ratio [FAR] – portraying, in three dimensions, the existing condition of built form (footprints/building massing/infrastructure) in the study area, and therefore the density of existing and proposed built and natural features of the study area, including infrastructure.

Social Exchanges : portraying, in three dimensions, data sets/indicators in each of four areas: Human, Organizational, Physical, and Economic (HOPE), to attempt to model human interactions on various levels.

Although the community client and the Research Team find it of great value to have population, economic, and physical data readily at hand, creating the three dimensional layers to describe "social exchanges" inherent in the existing condition is perhaps the most original aspect of the project to date. The team is unaware of any applications of modeling these types of data for the purposes of community development and urban design. Phase II of the project is focused on building upon what is already in place, and expanding the partnership to include research faculty and students at two universities along with community organizations working in Southwest Detroit and will focus on creating a comprehensive tool that can lead toward balanced, equitable, and sustainable community design and development. While Phase I featured limited community process, one of our key intents in Phase II has been more engagement and direction from the Community Client.

The study area for Phase II expands beyond the pilot project to include all of SDDC's targeted area:





- I-94 Freeway from the John C. Lodge Freeway to Grand River Avenue, continuing northwest on Grand River Avenue to Tireman Avenue and running west on Tireman Avenue to the Detroit City Limits (north)
- John C. Lodge Freeway (east)
- The Detroit River (south)
- Detroit City Limits (west)

The last six months of design research have focused on three primary areas of inquiry: product delivery for the Community Client; Collaboration among the Research Team; and dissemination of process and results through presentations and publication.

The scope of work in Phase II focuses on four areas of effort:

# Task 1: Process

Task 1 has involved resolving funding, work plan, budget, schedule and contractual agreements with Research Team members, SDDC (community client) and funders as well as lab, hardware, software and other necessary logistics – much of which demanded more time than had been originally anticipated. The community client identified seven members of their Board to serve as an Ad Hoc Committee. This group, hand selected by the SDDC Executive Director for geographic and service delivery diversity and capacity to apply digital technologies, was charged to work with the Research Team.

While the project is driven by a virtual digital model, face-to-face meetings were essential to advancing our work. The Research Team met monthly with the SDDC Ad Hoc Committee and provided necessary input, support and follow up. Research Team meetings were held regularly at the LTU research office - initially every two weeks, then on an as needed basis. We employed a Windows Live "Skydrive" as a shared digital workspace. Each Research Team member posted progress for team review and Research Director direction<sup>xx</sup>. An invited presentation to the Michigan Association of Planners (MAP) Annual Conference occurred in October 2008, and four others (to date) are scheduled for 2009<sup>xxi</sup>. Deliverables in this task include community process, evaluation, and preparation of required deliverables for our primary funders (AIA and LISC).

# Task 2: Data Collection + Review

Task 2 included both refining the existing Phase I data based on SDDC and research team input; and identifying, documenting, and obtaining new data sets for the VDCmp digital interface, working closely with the SDDC Ad Hoc Committee members. Deliverables include refined and updated Phase I data layers – such as historic + cultural assets, Blue, Green + Gray infrastructure, and demographic data. Primary to this task was the engagement of the seven SDDC Ad Hoc Committee Members. Research Team members were each assigned two to three members and then worked with them on an individual basis to understand current organizational and work plan goals. Once gaining consensus agreement on data direction, the Research Team identified and obtained the corresponding digital data sets from exciting sources and generated new data layers for the digital interface.







#### Task 3: VDC Digital Interface

Task 3 included both refining the existing Phase I data base and model based on SDDC and research team input and adding new 3D information to the Study Area, HOPE and Physical layers and improving functionality and graphic expression. This was a primary goal of the Research Director, as the graphic quality of the 2007 interface was not fully conveying the rich and diverse character of the Southwest Detroit neighborhood<sup>xxii</sup>. Deliverables in this task include an updated data base and model, with SDDC member locations; Neighborhood boundaries, a new Road layer (non-Google); and 2D land use and zoning. In addition, much focus was devoted to updating HOPE Layers. For the physical Model we had hoped to identify or purchase existing 3D files to avoid having our student Research Assistants spend all of their time modeling physical density, as we did in 2007. To date, we have yet to find additional available 3D models in the SDDC study area, even those for purchase<sup>xxiii</sup>. The Research Team continues to focus on improved graphic quality and functionality for the digital interface, including the design and addition of data layer legends, balloon information windows, building a community character + image bank on the project Skydrive, and limited incorporation of animation/video.

#### Task 4: Training, Analysis + Application

At time of writing, the Research Team has yet to engage in Task 4. The work plan has it scheduled largely for focus in 2009. There are two parts to Task 4. Part one includes the creation of a web presence for the VDCmp project. This has proven complex, and will need to involve a layered approach to both accessibility and information, including truly public viewing access, SDDC access and manipulation, and Research Team (proprietary) levels of use. We will also engage in technical assistance and training for, and accessibility of the Web Portal with the SDDC membership<sup>xxiv</sup>. This task will focus on utilizing the VDC digital interface to do Urban Design (!). Urban design (physical) recommendations for increased density and future urban form in the study area will be based on the SDDC Land Use Plan, priority development areas and Ad Hoc Committee member Work Plans. Planned deliverables will include an initial analysis utilizing updated and new data layers to confirm relevant and useful design work for each of the seven Ad Hoc committee members. The Research Team will complete initial modeling of 3D Zoning (Build -out envelopes) in the study area in order to determine "as of right" density (FAR).

Initial future urban form recommendations of a "high spine" along Michigan Avenue and the chevron (galon) from Michigan Central Station to the West Riverfront, were made at the conclusion of the 2007 pilot project, and are illustrated, left.



# VDCmp Digital Interface Layers Created to Date

The following provides a narrative and graphic overview of approximately 50% of the 65 + data layers created to date in Phase I and Phase II. At time of writing, we were about to hold our year-end progress meeting with the community client to share with them the work completed to date. Each layer of the interface has a parallel information set: compressed digital file for viewing in Google Earth (.kmz or .kml comprised of one of more: geo points, sketch up models (detailed), custom icons (3D graphics), interactive information balloons, extruded polygons, et al); a brief narrative (including explanation of the data layer, extrusion metric, sources, etc.); and a legend. The following layers are described and have a companion illustration:

## VDC Digital Interface (Data Base + Model)

## 1. Project Context

Southwest Detroit is located at 42° 19' 27" N latitudel83° 06'22"W longitude (Regional Detroit, Wayne County, the Great Lakes Region, North America, Planet Earth!).

2. SDDC Study Area

The SDDC service area encompasses 12,450 acre, 19.45 square mile neighborhood and is bounded by the I-94 Freeway from the John C. Lodge Freeway to Grand River Avenue, continuing northwest on Grand River Avenue to Tireman Avenue and running west on Tireman Avenue to the Detroit City Limits (north), John C. Lodge Freeway (east), The Detroit River (south), and Detroit City Limits (west).

3. SDDC Member Locations/Neighborhoods

Locations of SDDC members were based on a September 19, 2008 membership list provided by the SDDC. Member organizations are represented by information icons, and have a balloon with their name, and if available: address, mission, image, and live weblink.

Locations of the greater neighborhood, and sub neighborhoods are color coded. Neighborhood locations were identified through historic neighborhood websites and realtor maps. Boundaries were confirmed with the community client. The sub neighborhoods are each typically half a mile by half a mile in size. Greater neighborhoods are typically one square mile.

4. SDDC Commercial Districts

Commercial Districts were based on boundaries in the *Savor Southwest Detroit's Five Neighborhoods* initiative (a marketing campaign to promote retail and restaurants in the neighborhood) and updated based on SDDC member feedback.



9.

#### 5. Historic + Cultural Assets: Formal

This layer represents the "formally" designated historic and cultural resources located in the study area. Government agencies at the municipal, state, and federal level that are charged with maintaining historic site + district registries have undertaken formal documentation and designation of these sites<sup>xxv</sup>. Each "formal" district features a polygon extruded based on number of contributing resources. Each site features a 3D visualization, a balloon window with image, narrative on significance, and a live weblink to the designating agency. In addition, a custom icon was created to provide a better visual sense of the geographic location of the assets in Google Earth.

6a. Is a 3D visualization in Google Sketch Up of historic St. Anne's Parish Complex, with the Detroit River, Ambassador Bridge, and Canada in the background.

6b. Is a 3D visualization in Google Sketch Up of the historic Ford Hunger March Site located on the Fort Street Bridge, including a representation of social density.<sup>xxvi</sup>.

7. Historic + Cultural Assets: Informal

No community can be defined solely on its "formally" designated resources. A rich layer of "informal" resources, well known, used, and relevant in the lives of community residents, exists and is worthy of documentation and consideration for leveraging future development. The Research Team asked the community client to identify historic and cultural sites that were not "formally" designated, but still held significance and importance to the community. The sites were located within Google Earth with geo-coded points (Star icon) and reveal a dense pattern of resources throughout the neighborhood. The historic and cultural sites are grouped according to eleven categories, including: Churches, Ethnic, Industrial, Government & Military, Services, Arts, Residential, Events, Social, Sports, and Miscellaneous. Some of the categories have identifiers as sub groupings (e.g. Industrial has sub areas of Union and Industry).

8. Historic + Cultural Assets (Density by Neighborhood)

This graphic summarizes the previous geo point map, illustrating the highest densities of informal resources in the study area in Delray (highest opacity of orange) to the lowest density in 48217 neighborhood (in lightest opacity of orange). This is not surprising, but ironic, given that the DRIC proposes to take 300 acres of the Delray neighborhood for landing, ramp and plaza areas.

9. Blue, Green + Gray Infrastructure:

This graphic is an assemblage of layers from the 2007 pilot project. Updated layers of the "preferred alternatives" of proposed major infrastructure projects had yet to be completed at time of writing. Gray layers include both existing and proposed infrastructure:





Detroit River International Crossing (DRIC), Detroit International Bridge Complex (DIBC), Ann Arbor-Detroit Rail Link - Light Rail ROWs Michigan Avenue + Fort Street, and the existing Port of Detroit.

10. Updated Green Infrastructure

This layer maps all of the existing Neighborhood Parks, Greenways, and proposed "Greenlinks" in the study area, constituting an update from the 2007 layer<sup>xxvii</sup>.

11. State Road Data

This layer represents all road infrastructure under the jurisdiction of the Michigan Department of Transportation (MDOT) within the boundaries of southwest Detroit. Traffic density is obtained from the 2007 MDOT Average Daily Traffic (ADT) Countsxxviii. Heights are extruded by 1m=100 vehicles per day.

## HOPE Layers

12. Housing Production by SDDC Members as of 2007

This layer is a good example of the layers mapped from the primary source of information for Phase I: SDDC's five year investment summaries. Here, the housing units constructed by SDDC CDC members, by census track, are illustrated.

## 13. Schools

Original data is from the Detroit Public Schools (DPS) website, which was supplemented by SDDC member feedback. Schools are plotted as open-DPS (purple), vacant (closed) DPS (white), Charter-DPS (orange), or Private (yellow). The community is interested in mapping schools for a number of reasons, including potential redevelopment of vacant buildings.

## 14. Churches

This layer illustrates any place of worship (Church, Mosque, Temple) in the study area. Original data sources are on-line phone directories. Secondary data sources are the community client and on-line searches.

#### 15. Land Use by category

This layer is based on data from the State of Michigan. At time of writing, parcel level land use data from the City of Detroit was still being pursued. Note that the study area is dominated by industrial (brown) and residential (yellow) uses.



16. Employers by category/Number of Jobs by Employer

This layer from Phase I maps the number of employers by category (Institutional, Production, Retail, Service, and Transportation), extruded by census track as well as geo-points identifying individual businesses (red points). Note the concentrations of employers along the commercial corridors of Fort Street, W. Vernor, and Michigan Avenue.

17. Brownfields

Brownfield sites in the study area are defined by the Detroit Community Outreach Partnership Center (DOCP)<sup>xxix</sup>. Existing brownfield sites within Southwest Detroit on based on definitions and data from the EPA, MDEQ, site visits, and other references in 2002. Color variations represent brownfield type. Extrusion represents assessed value<sup>xxx</sup>. Maximum extrusion is 1000m for highest assessed value within the boundary and minimum extrusion height is 10m. Parcel boundary (outlines) data was captured from Wayne County based on 1999 tax plat maps<sup>xxxi</sup>.

Physical Model

18. This layer illustrates all 3D Modeling of the SDDC Study Area, primarily accomplished in Phase I (Vernor Corridor; Michigan Corridor; et al) paired with Google Earth 3D Warehouse (primarily Downtown Detroit and Corktown, and a model of the proposed build out of the West Riverfront by Chan, Krieger, Sienewicz, 2007 (bottom illustration). At time of writing, additional 3D models of Delray, and other parts of the study area were expected from MDOT.

Detroit Neighborhood Drilldown (Social Compact)

The Detroit Economic Growth Corporation (DEGC) commissioned a study of Detroit's neighborhood demographic and economic profile in 2007 from the Washington, DC based Social Compact, Inc.<sup>xxxii</sup>. In support of "information-led" development, the objective of the study was to document "hidden strengths and opportunities" that exist beyond downtown Detroit. In general, the data provides a "mid-census" update and is attractive to community groups and non-profits because it portrays a more positive picture of population growth, disposable income, and other economic indicators of interest to investors and developers. Social Compact data is circa 2006, and relies upon a variety of sources, including the 2000 Census, a Drilldown study circa 2004, a Claritas study circa 2004, USPS data 2005, IRS data 1998-2005 and HMDA data 2000-2006. Most Social Compact data is arrayed by census block group.

19. Census data (2000) - Population Change between 1990-2000

This layer was created in Phase I and illustrates both population growth and loss. The study area is growing in the census tracts with blue extruded polygons (proving that at least one neighborhood in Detroit is gaining population!) and losing population in the census tracts where the red polygons appear. White polygons represent relative stability of population.





20. Population Census: The data source is the 2000 Census. Data is shown per census block group. The three-dimensional extrusion is a maximum of 1000 m proportionate based on the census population.

21. Population Drilldown: The data source is the Drilldown study circa 2004. Data is shown per census block group. The three-dimensional extrusion is a maximum of 1000 m proportionate based on the Drilldown population. One can easily see where the neighborhood is growing. Note: differences between the Social Compact data and the Census could partly represent undercount through the 2000 US Census. It could also partly represent a change in population between 2000 and circa 2004. The three-dimensional extrusion is a maximum of 1000 m proportionate based on difference in population. The equation for the extrusion was:  $600 \text{ m} + (1 \text{ m / person}) * (Population_Difference).$ 

22. Population per Acre: The data source is the 2000 Census. Data is shown per census block group. The three-dimensional extrusion is a maximum of 1000 m proportionate based on population per acre. Note that high concentrations of population appear in the proposed vicinity of the DIFT.

23. Apparel Leakage: Leakage is defined as "net apparel expenditure being spent by residents outside of their area". Negative leakage means that the area is attracting residents from outside to buy apparel there. Units are dollars per year. The data source is the Drilldown study circa 2004. Data is shown per census block group. The three-dimensional extrusion is a maximum of 1000 m proportionate based on leakage dollars.

24. Apparel Potential: Using the Apparel Leakage data, this is the equivalent square footage of apparel square footage that may be added to an area. Social Compact estimates that \$340 of expenditure per year supports one square foot of apparel space. Data is shown per census block group. The three-dimensional extrusion is a maximum of 1000 m proportionate based on square foot potential.

25. Grocery Leakage: Leakage is defined as "net grocery expenditure being spent by residents outside of their area". Negative leakage means that the area is attracting residents from outside to buy groceries there. Units are dollars per year. The data source is the Drilldown study circa 2004. Data is shown per census block group. The three-dimensional extrusion is a maximum of 1000 m proportionate based on leakage dollars.

26. Grocery Potential: Using the Grocery Leakage data, this is the equivalent square footage of grocery square footage that may be added to an area. Social Compact estimates that \$343 of expenditure per year supports one square foot of grocery space. Data is shown per census block group. The three-dimensional extrusion is a maximum of 1000 m proportionate based on square foot potential.



27. Business Density: This is the businesses establishments per acre. The data source is the Drilldown study circa 2004. Data is shown per census block group. The three-dimensional extrusion is a maximum of 1000 m proportionate based on business density.

28. Business Employment: This is a count of people employed by businesses located in those areas. Note: this is not a count of local residents employed in the areas, but total employment. The data source is the Drilldown study circa 2004. Data is shown per census block group. The three-dimensional extrusion is a maximum of 1000 m proportionate based on business employment.

29. Housing Values-Difference: This layer illustrates differences in the value of housing per the Census and Drilldown data. Data is shown per census block group. Note: the data source from the Drilldown study circa 2004 was collected by census tract. There is wide variation of housing values within a census tract. Therefore, this data mostly shows the variability between average housing value and that of the block group. However, it also shows time effect between the 2000 Census and the circa 2004 Drilldown. The three-dimensional extrusion is a maximum of 1000 m proportionate based on difference in housing values.

30. Units Difference: This layer illustrates the difference between the 2000 Census and the circa 2004 Drilldown study. Data is shown per census block group. The difference could represent a undercount in the 2000 Census, but more likely represents the new housing constructed or removed over the time period. The three-dimensional extrusion is a maximum of 1000 m proportionate based on the difference in units.

SDDC Ad Hoc Committee Member Data Directions:

Each of the seven members of the Ad Hoc Committee were charged with identifying existing data sets to inform layers of the interface that would support their current organizational goals and work plans. The following illustrates three of the member data layers:

31. Greater Corktown Development Corporation [GCDC]: Parking Lot Capacity

The GCDC's mission, as a community-based housing development organization since 1976, "is to facilitate the redevelopment of a diverse, vibrant and affordable urban village in the Greater Corktown area"xxxiii. Corktown is Detroit's longest inhabited neighborhood, with an intact historic district surrounded by urban renewal scale fabric and bisected north and south by the historic Michigan Avenue commercial strip. Many parcels were converted to surface parking lots in support of games at the now shuttered and partially demolished historic Tiger Stadium at Michigan + Trumbull. GCDC's Executive Director, Tim McKay, speaks compelling about not wishing his neighborhood to become a "landscape of parking lots". In support of this, McKay asked the Research team to map parking lot capacity in his service area, with an eye toward identifying easily developable parcels - particularly those in public ownership and/or with negative revenue cash flows. The layer shows lots south of Michigan Avenue completes; other data in North Corktown to come at time of writing. Models of three



vehicles were created in Sketch Up to represent public (Yellow Mustang), private (Blue Focus), institutional (Red Pick Up Truck) ownership of parking, and capacity (one vehicle = 40 parking spots).

32. Bagley Housing Association (BHA)

Bagley Housing, a not-for-profit Michigan Corporation, "serves as a leader and provides resources for community development in the Hubbard Richard and Hubbard Farms districts (and other designated areas) of Detroit. BHA seeks to complement other efforts in the area to build a thriving, economically, ethnically and culturally diverse residential/business urban environment. Specifically, BHA works to improve housing stock for low and moderate income families, attract commercial development and institutional improvement and development, promote job creation, and address other elements needed for a sustainable neighborhood", XXXIV. BHA was interested in mapping property condition, parcel ownership and vacant land in their service area to help inform future development. Data were extracted from an existing hard copy map "BHA Housing Quality Analysis and Land Request", circa 2004. The BHA service area is primarily bounded by I-75 to the south, Clark Street to the east, Livernois Avenue to the west, Michigan Central Railroad to the north. Polygons represent individual lots. Heights of polygons are extruded based on condition (good, poor, etc). Land uses in the service area, including Commercial, Parks, Churches, Schools are also noted.

33. Vacant Homes

This layer illustrates homes per acre, calculated based on the total vacant homes within a block group. Heights are extruded based on the density of vacant homes ranging from 10m (0 vacant homes per acre) to 1000m (2.78 vacant homes per acre). Vacant Home data obtained from the 2000 Census Vacant Housing dataset Summary File 1 (SF 1)<sup>xxxv</sup>. Unexpectedly, the highest number of vacant homes is concentrated closer to Downtown.

34. Neighborhood Centers, Inc. (NCI)/Springwells: Future Teens

NCI's mission is to support "successful families in healthy neighborhoods" by developing healthy urban environments; nurturing safe, healthy and productive lifestyles in children and adults, and, connecting families and individuals with resources that address their needs and aspirations"<sup>xxxvi</sup>. NCI asked the Research team to address metrics related to Future Teens in order to assist them in planning and designing open space, recreational, educational, jobs training, and other support services for youth in their service area. The layer illustrates density of future teens in the study area. Data is from the 2000 Census for age groups "Under 5" and "5 to 9", groups that would be 8 to 17 years old now. Data is shown per Census block group. The threedimensional extrusion is a maximum of 1000 m proportionate based on number of people. Note that concentrations align down the center of the neighborhood, including the NCI/Springwells service area.

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#### **VDCmp : Research Team**

Lawrence Technological University College of Architecture and Design: Constance C. Bodurow, Assoc. AIA, AICP, Research Director, Assistant Professor of Architecture Jordan Martin, Research Assistant Calvin Creech, PE, LEED AP, Research Partner, Adjunct Professor, Civil Engineering University of Detroit Mercy: Dr. Alan Hoback, PE, Chair, Civil & Environmental Engineering

#### **VDCpp : Research Team**

Prof. Tomasz Lechowski, Warsaw Politechnica University SOA (WAPW) + ATI Sp. z.o.o Detroit Research Assistants: Elijah Kafer, Danielle Crane Warsaw Research Assistants: Agata Sander, Anna Twarogowska

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#### **VDCmp Community Client:**

Southwest Detroit Development Collaborative (SDDC): Dr. Kristine B. Miranne, PhD, Executive Director, and Brittany Ward, 2008 Americorp Intern

2008 Ad Hoc Committee Members: Lisa Goldstein, Executive Director, Southwest Detroit Environmental Vision; Dan Loacano, Executive Director, Bagley Housing Association; Tim McKay, Executive Director, Greater Corktown Development Corporation; Dennis Nordmoe, Executive Director, Neighborhood Centers, Inc.; Matt Prochaska, Executive Director, and Amy Raupp, GIS Specialist, Michigan Avenue Business Association; Angie Reyes, Executive Director, Detroit Hispanic Development Corporation; Kathy Wendler, Executive Director, Southwest Detroit Business Association.

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## ENDNOTES:

<sup>i</sup> The primary author first suggested this approach in her Masters Thesis: <u>The Reconstruction of the Industrial Landscape: a hopeful</u> <u>future for the Ford Rouge Complex</u>, MIT School of Architecture + Planning, 1991.

<sup>ii</sup> Jacobs, Jane. <u>Death and Life of Great American</u> Cities. New York: Random House. 1961.

<sup>iii</sup> Koolhaas, Rem. Delirious New York: a Retroactive Manifesto for Manhattan. Oxford University Press: 1978.

<sup>iv</sup> Urbanist David Dixon chaired a Density conference in Boston during Autumn 2003 sponsored by the AIA RUDC and the BSA. See: McCown, James, <u>DENSE DEBATE</u>, Architecture; December 2003, Vol. 92 Issue 12, p 77, 2p, 1c.

<sup>v</sup> Suggested by Cruz during his presentation at the University of Michigan Taubman College of Architecture and Planning, Global Place: Practice, Politics, and the Polis, January 4-6, 2007. For the Venice Biennale exhibit on urban density, see: <u>Architectural Record</u> November 2006, Cities, Architecture, and Society Exhibition in the Arsenale p. 64.

<sup>vi</sup> Bodurow, Constance. <u>City of Worth: Value Densification Community</u> <u>Pilot Project (VDCpp)</u>. Proceedings of the ACSA Annual Meeting, University of Houston School of Architecture: March, 2008. All Rights Reserved. The results of the VDCpp were also presented at national ACSA, ACSP and AIA conferences and at local symposia at UDM and Cranbrook during the fall of 2007.

v<sup>ii</sup> Bodurow, Constance. <u>+ D IND DEV: Industrial Spatial Logic and the Transformation of the City</u>. Proceedings of the ACSA Central Regional Conference, University of Wisconsin-Milwaukee School of Architecture + Planning: October 20-22, 2006. All Rights Reserved.
v<sup>iii</sup> The primary author believes that the act of "making" is essential to

the character of Detroit. Residents of Detroit have engaged in "making" from First Nations (farming and fishing) to the present day (cars and music, etc.). Progressive disconnection from the activity of "making" is therefore central to the deterioration of the city's collective social, economic, and physical fabric.

<sup>ix</sup> More recently, ESRI has introduced ArcGIS 3D Analyst, which allows for surface generation and realistic perspective images.

<sup>x</sup> Chopra, Aidan. Google Sketch Up for Dummies. Wiley: 2007. By activating "3DWarehouse" one can also view and utilize models of the built environment that others have created.

<sup>xi</sup> While free versions of both softwares can be downloaded from the google.com website, the VDCmp makes use of the "Pro" versions, thanks to generous contributions from Google Corporation. ESRI donated ArcGIS, which is also a fundamental software platform integrated within the digital interface, used by our Civil Engineering colleagues.

<sup>xii</sup> Michael Batty is currently the Director of the Centre for Advanced Spatial Analysis (CASA) at the University College, London, England. His books include: <u>Fractal Cities</u>. Academic Press: 1996; <u>Spatial Analysis: Modeling in a GIS Environment</u>. Wiley: 1996; <u>Advanced Spatial Analysis: The CASA book of GIS</u>; ESRI Press: 2003; <u>Cities and Complexity</u>. The MIT Press: 2005; and <u>GIS</u>, <u>Spatial Analysis and Modeling</u> ESRI Press: 2005; et al.

<sup>xiii</sup> Maas, Winy, MVRDV/DSD, et al. <u>Space Fighter: The Evolutionary</u> <u>City (Game:)</u>. Actar: 2005. Maas' work is jointly with the University of Delft Berlage Institute and the MIT Media Lab, including Space Fighter, which is a proprietary interface utilizing game theory.

<sup>xiv</sup> Including work being conducted at: Savannah College of Art + Design (SCAD), University of North Carolina-Charlotte, the Future Cities Lab LLC at the University of Virginia, and the Sensible City Lab at MIT, among others.

<sup>xv</sup> Our investigation includes, to date, the work of Alan Berger (<u>Drosscape</u>, et al); Teddy Cruz (<u>Architecture of the Borderlands</u>, et al; Winy Maas (<u>KM3: Excursions on Capacity</u>); Vicente Guallart and Willy M]ller (<u>Hi-Cat: HiperCatalunya: research territories</u>); Julie Campoli and Alex S. MacLean, Lincoln Institute of Land Policy (<u>Visualizing Density</u>); and Edward Tufte (<u>The Visual Display of</u> <u>Quantitative Information</u>, et al).

<sup>xvi</sup> See State of Michigan and Province of Ontario DOT websites:
Michigan.gov/mdotstudies, and partnershipborderstudy.com.
<sup>xvii</sup> Cite Southwest Detroit population and ethnicity breakdown.

<sup>xviii</sup> Primary Author's Lawrence Tech CoAD Spring and Fall 2008 studios engaged issues of value densification, with students mapping diverse metrics of their respective study areas in the analysis phase to understand both built and social densities and identify opportunities for future design and development.

<sup>xix</sup> SDDC Five Year Investment Summaries 2002-2006, including: housing, education, commercial/economic development, public safety/environmental, infrastructure, and parks and greenways.
<sup>xx</sup> Our near term goal is establishing a VDCmp web presence.

<sup>xxi</sup> Bodurow, Constance and Miranne, Kristine. <u>The Value of Density:</u> <u>Seeing is Believing</u>, presented at Planning Michigan, MAP Annual Conference, October 1-4, 2008, Kalamazoo, MI. Accepted for 2009: ACSA Annual Meeting, Portland, OR, Urban Affairs Association Conference, Chicago, IL March 2009; APA National Conference Minneapolis, MN, April 2009; and the AIA National Convention, San Francisco, CA, May 2009. All Rights Reserved.

<sup>xxii</sup> I credit a number of colleagues for motivating me in this direction. In particular, Michael Hebbert, The University of Manchester, England, who moderated my session presentation of the VDCpp at the ACSP National meeting held in October 2007 in Milwaukee, Wisconsin. Professor Hebbert commented that my research was "essentially holding up a mirror to the community. You need to ask, do they recognize themselves? How do they perceive themselves?" Certainly essential characteristics of the study area, e.g.: presence of the largest Hispanic population in the region was not telegraphing in the 2007 interface.

<sup>xxiii</sup> Sanborn has 3D files available for purchase for most cities, but unfortunately, not Detroit.

<sup>xxiv</sup> The Research Team will collaborate on the integration of the digital interface into SDDC Web Portal being created in a separate project by Madonna University.

<sup>xxv</sup> e.g. State Historic Preservation Office (SHPOs), et al.

<sup>xxvi</sup> These 3D visualizations are crafted by Jordan Martin, VDCmp Research Assistant and 4th year Architecture Student in the Lawrence Tech CoAD. Jordan is perhaps the most facile master of Sketch Up software that the Primary Author has met!

xxviixxvii Source: Microstation Map from the City of Detroit, Parks + Recreation Department, August 18, 1997; and documents from Hamilton Anderson Associates, Inc. illustrating all Green Infrastructure Projects planned in the SDDC study area.

xxviii ADT available at the State of Michigan MDOT website: http://www.michigan.gov/mdot/0,1607,7-151-9622\_11033\_11149----,00.html

<sup>xxix</sup> The DOCP is a collaboration between the University of Michigan, Wayne State University, and Michigan State University to provide outreach services for communities in Detroit. University students have aided Southwest Detroit Environmental Vision (SDEV) in gathering information on sites in southwest Detroit, and the use of university staff to serve as a neutral party in environmental discussions has increased credibility and trust of redevelopment efforts.

<sup>xxx</sup> Source: City of Detroit Assessor's Office.

<sup>xxxi</sup> No additional metadata currently exists regarding the quality of the spatial information associated with this dataset.

<sup>xôxii</sup> Talmage, John, et al. Social Compact, Inc. <u>Detroit Neighborhood</u> <u>Market DrillDown: Catalyzing Business Investment in Inner-City</u> <u>Neighborhoods</u>, October 2007.

xxxiii Go to: http://www.corktowndetroit.org/

xxxiv Go to: http://bagleyhousing.com/

xxxv Tabular data available at: http://factfinder.census.gov

xxxvi Go to: http://www.e-nci.org/