Architect as Developer

A Model for Triple Top Line Development

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Abstract

Triple top line development is a methodology for developing buildings that are not only economic assets, but environmental and social assets, with the understanding that in doing so, there will be a spillover effect among concentrations, resulting in added benefits for each. Architects are trained and educated to design buildings in this manner, but lack the necessary interests and influence to bring triple top line developments to fruition. Architects, in their traditional roles, do not produce buildings; rather they provide a service for developers and owners who do. The developers controlling project financing are legally and ethically entitled to the ultimate design authority, and their interests are often in direct conflict with those of the architects they hire. Developers are strictly concerned with a building's economic performance and will strike down design proposals which do not provide an immediate financial return. This is unfortunate, because ecological and social equity considerations have the potential to not only enhance the economic viability of projects, but create more pleasing environments in the process. These oversights open doors for Architect-Developers to develop their own triple top line projects, regain the ultimate design authority, and profit from the added value their designs bring to buildings and communities.

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List of Illustrations

Introduction

Triple top line thinking is a methodology for developing buildings that are not only economic assets, but environmental and social assets, with the understanding that in doing so, there will be a spillover effect among concentrations, resulting in added benefits for each. Architects are trained and educated to design buildings in this manner, but lack the necessary interests and influence to bring triple top line developments to fruition. The problem is that architects, in their traditional roles, do not produce buildings; rather they provide a service for developers and owners who do. This service-for-fee structure undermines architects' interests in creating buildings that provide strong economic returns in that it prevents architects from profiting from the added value their designs bring to the real estate market. More significantly, this structure forces architects to defer control of design decisions to developers.

Real estate developers are legally and ethically entitled to the ultimate design authority as a result of their control over project financing, and their interests are often in conflict with those of the architects they hire. Developers are strictly concerned with a building's economic performance and will strike down design proposals which do not provide an immediate financial return. This is unfortunate, because ecological and social equity considerations have the potential to not only enhance the economic viability of projects, but create more pleasing environments in the process.

These oversights open doors for Architect-Developers to develop their own triple top line projects, regain the ultimate design authority, and profit from the added value their designs bring to buildings and communities. Designer Bruce Mau writes that "the world would be a better place if more of what we built in our cities was determined by people educated and trained with culture, civic awareness, aesthetic sensitivity and historical knowledge," and the architect-developer model has the ability to make this vision a reality (Mau).

Part I: Problem

Chapter 1: The Triple Top Line Defined

Triple top line thinking is a response to the triple bottom line of sustainability, a method of accounting that attempts to quantify the social and environmental impact of a building in a way comparable to the economic impact, in an effort to show improvements and make more in-depth evaluations regarding building projects (Sustainability Dictionary). The problem with this type of analysis in practice, however, is that it tends to take place after the fact and still be centered on economic considerations, with social and ecological benefits considered as an afterthought, rather than given equal weight at the outset. Triple top line thinking can bring ecological and social questions and considerations to the forefront of the design and development process, where they can be used as a design tool to create value in all three sectors as it pertains to buildings. Often a project that begins with pronounced concerns for ecology or social equity can turn out to be financially lucrative in ways that would never have been imagined if the development were started from a purely economic perspective (McDonough and Braungart 150-154).

William McDonough, architect and co-author of the book *Cradle to Cradle: Remaking the Way We Make Things*, is largely credited with the development of triple top line design thinking and makes use of the Sierpinski tile (a fractal triangle) to frame the various economy, ecology, and social equity questions and considerations within a larger context. The tile is not a symbol, but rather a tool for design that allows architects to plan for developments by moving around the fractal, asking questions and looking for answers pertaining to the triple top line. The questions asked and answers given will depend on where they fall in the economy, ecology, or social equity portions of the tile.

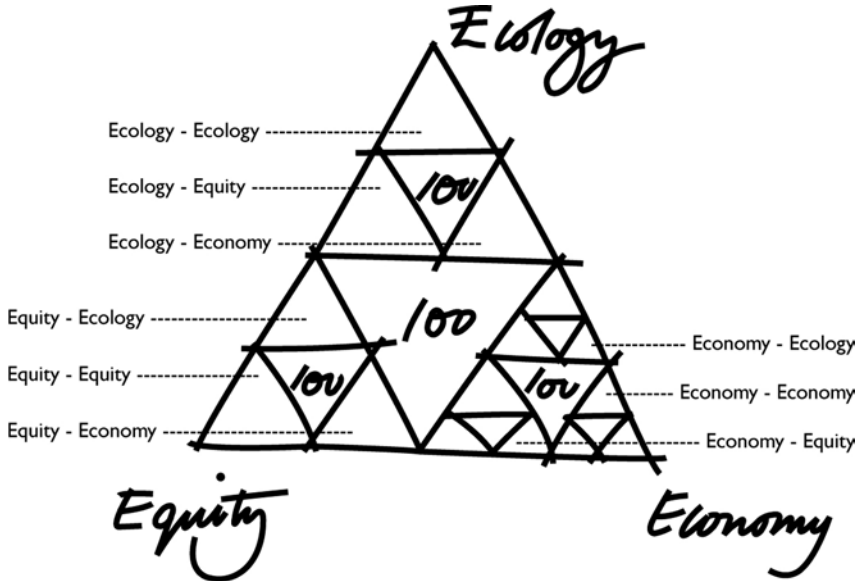


Figure 1 - William McDonough's Fractal Triangle Diagram

The economy division of the fractal located in the lower right portion of the triangle is the place where most developers operate and evaluate decisions. The economy division is representative of the triple bottom line, in that while cognizant of ecological and social equity considerations, it still views everything through an economic lens. Moving about the economy triangle, the extreme lower right economy-economy sector serves as the embodiment of pure capitalism and questions, how profitable a development project is? Transitioning to the economy-equity sector, the emphasis shifts towards fairness, asking, to what extent does a development appeal to different socio-economic groups? Finally, the subset of economy-ecology, which is rooted in what McDonough calls 'eco-efficiency', asks how resource efficient a development is.

The ecology triangle within the Sierpinski tile is located at the top of the fractal and transitions from eco-efficiency to what McDonough calls 'eco-effectiveness' with the ecology-economy sector asking how resource effective a development is? Moving along to the very top of the fractal triangle the ecology-ecology sector represents pure environmentalism. Here, the question is to what extent is a building obeying nature's laws? The final sector of the ecology division is that of ecology-equity, which asks, how do ecological considerations enhance community engagement?

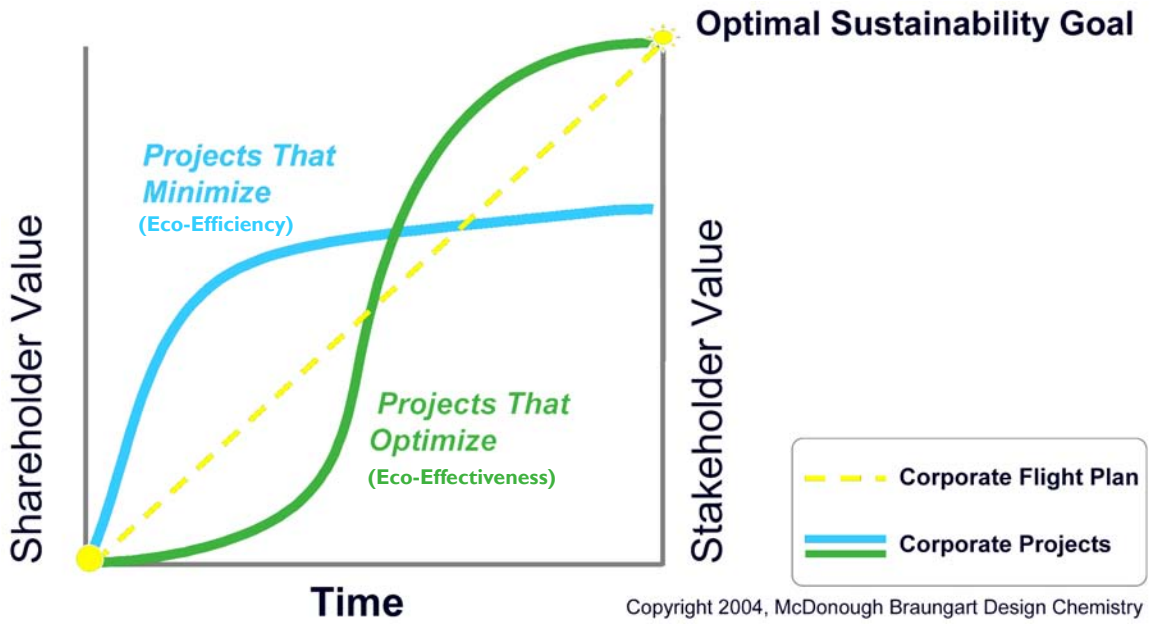


Figure 2 - Eco-Efficiency vs. Eco-Effectiveness Diagram

The final component of the fractal is the social equity division, which begins with the equity-equity sector representing pure socialism. Completely isolated from economic and ecological considerations, the question here is how does a development respect its stakeholders? Transitioning to the equity-economy sector, the question becomes, to what extent does a development embrace the surrounding community,

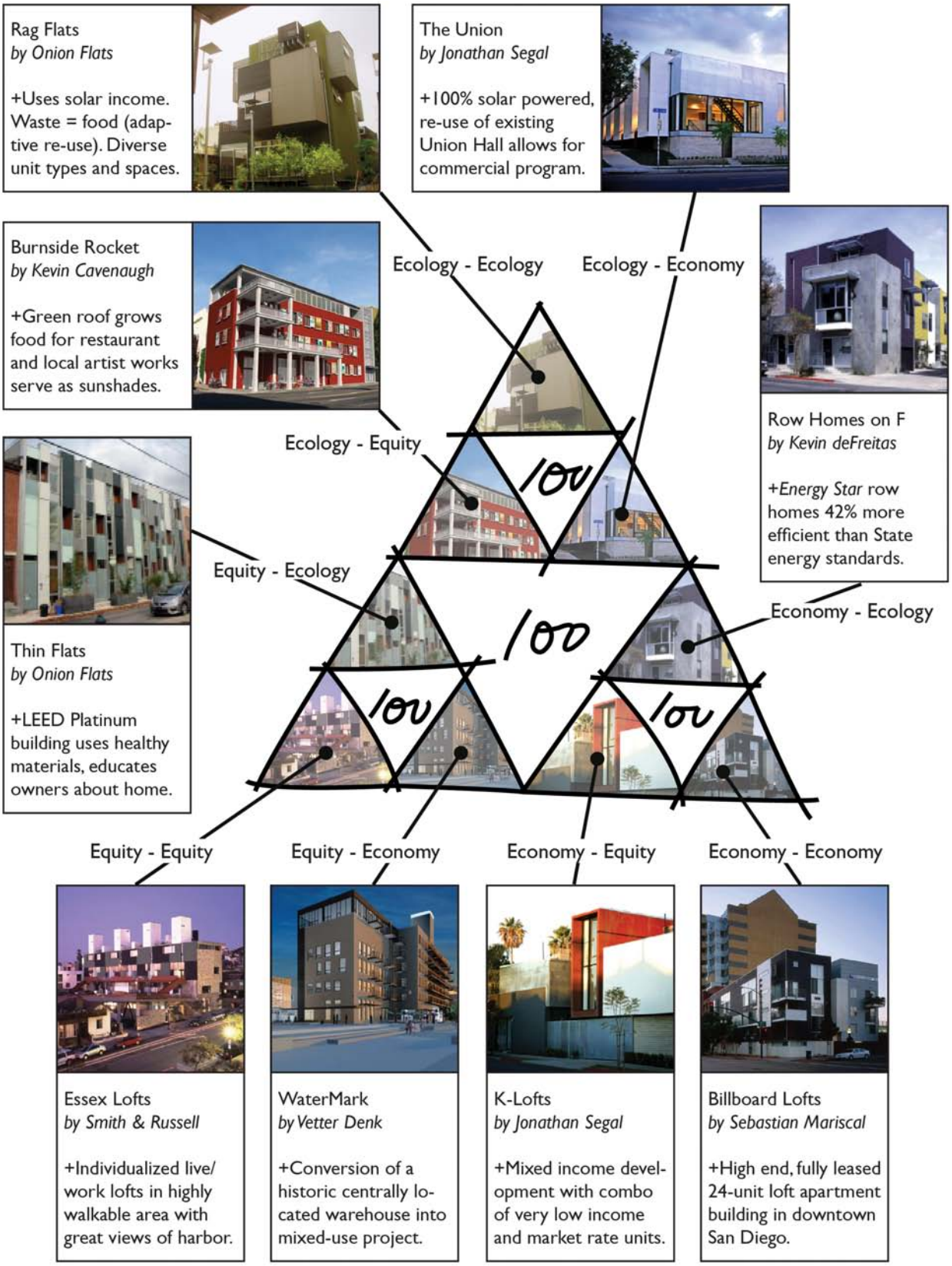


Figure 3 - Triple Top Line Precedent Study

its history and future aims? Finally, the equity-ecology sector questions how a building impacts the overall health and well-being of its patrons (McDonough and Braungart 150-154)?

In moving towards triple top line development, the Sierpinski tile can be recycled throughout the development process to align decisions made in site selection, programming, building design, and construction, with the overall economic, ecological, and social equity goals identified at the project's conception. This holistic approach gives architects the ability to simultaneously prioritize and maximize their efforts in creating a building that performs not only as an economic asset, but ecological and social asset as wall. This sets triple top line development apart from triple bottom line and traditional development in that it leads to a building project that not only benefits the developer and his investors (the shareholders), but the community and environment in which it resides (the stakeholders).

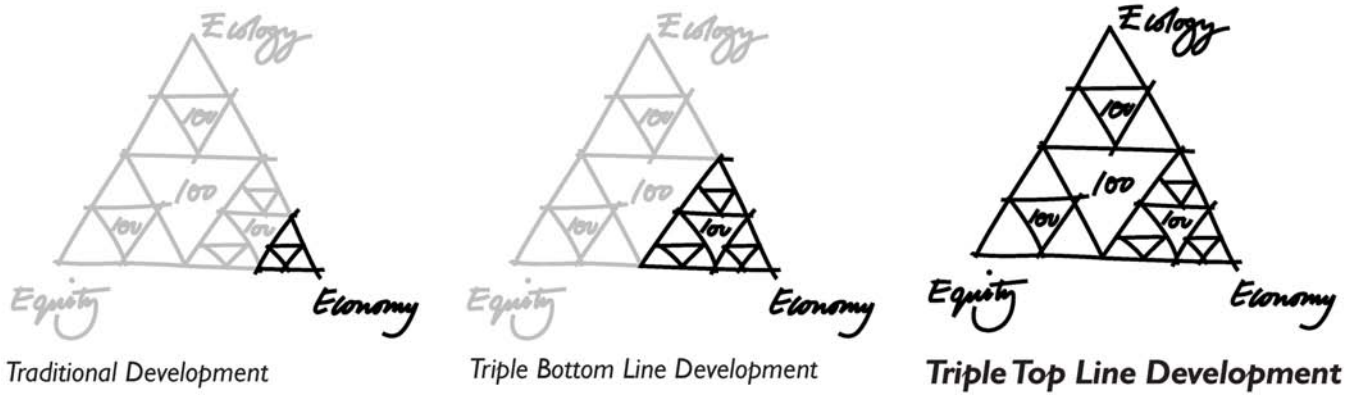


Figure 4 - Development Considerations Diagram

Chapter 2: Triple Top Line Restrictions

Having explored the depths of triple top line design thinking and the additional benefits it brings to the development process, it begs to question why there are not more built examples of triple top line developments in the United States. The problem as it turns out, is not within the theory, but rather in the transition from theory to practice. The current development structure is one of fragmented interests and of fragmented processes, which makes economically, ecologically, and socially integrated projects nearly impossible to develop.

Fragmented Interests

For triple top line development to be achieved, one of the prerequisites is ensuring that the people responsible for project delivery have a motivation for making triple top line projects a reality. Unfortunately, under the current structure, neither the architect nor developer has a vested interest in the integration of economy, ecology, and social equity. According to architect-developer, Robert Steinberg (FAIA), "Architects and Developers have fundamentally different yardsticks for measuring success. Most architects value permanence, a philosophical imperative to leave something behind [i.e., social value]. The developer's yardstick is usually, simply money; if you do not value and have money, you are not a developer long [i.e., economic value]" (Miller 19). The problem is not that architects and developers have different values, but that their value systems are taken to such extremes that they become intolerant of one another. This was pointed out by Paul Lurie, the keynote speaker at the Chicago AIA Architect as Developer Conference, who observed that,

> The culture of the architectural profession is anti-business. It is a profession emphasizing creative expression. Anything standing in the way of the creative process is looked down upon. Economic issues often can interfere with artistic expression. Sound business principles are perceived to interfere with artistic freedom. Architects who make a lot of money are often frowned upon by the arbiters of architectural fashion. I have even had well-known architects tell me that they do not maintain financial records to determine whether they are making or losing money on a project for fear that this information will undermine the quality of the work (Miller Appendix 14).

Developers are guilty of extremism with the value they have placed on economics over all else. John Portman, architect-developer and co-author of the book, *The Architect as Developer*, admonishes the real estate industry (the major force shaping our built surroundings) for having done very little to

recognize its responsibility to the environment and asserts that developers have been selling the public an inferior product for years in exchange for quick profits. Portman points out that in the United States, with its history of rapid growth and change, developers have had little trouble in marketing buildings of poor design, because 'any product' has been better than 'no product' (Portman and Barnett 7).

Clearly, with such a strong divide in values and measures of success amongst architects and developers, somebody's interests must give way in order for any projects to move forward and get built. Unfortunately for architects, in almost all cases of conflict, the developer interests prevail and architects are left frustrated with a lack of responsibility, compensation, and design control. Collectively, these frustrations present a major dilemma for the profession of architecture moving forward.

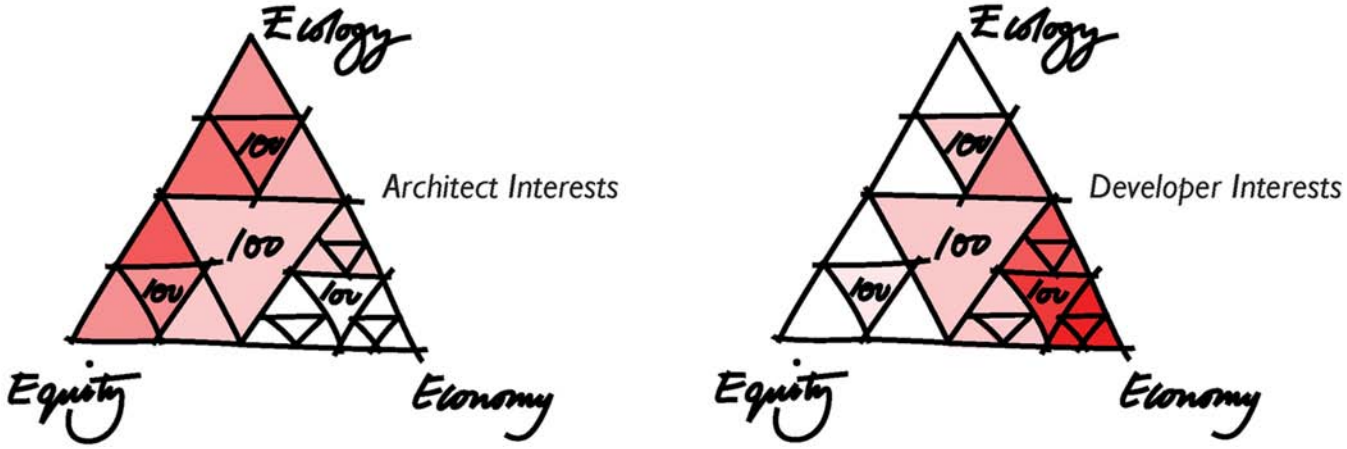


Figure 5 - Architect vs. Developer Interests Diagram

The Architect's Dilemma

Architects are perceived by the general public to enjoy a lifestyle of independence and creativity, designing freely while maintaining a high standard of living (Grant ix). This perception has attracted many aspiring designers to the field of architecture over the years, but the harsh realities of low pay and lack of ultimate design authority have driven many of them away from the profession (while frustrating those who remain in it). The devolution of architectural responsibilities in recent decades is the root of this disconnect, and unless the process is reversed, the profession will continue to self-marginalize until it ceases to exist as we know it.

The profession of architecture dates back more than 4,500 years to Ancient Egypt where the polymath, Imhotep was commissioned to build the first pyramid for King Djoser as the master builder responsible for the design, engineering, and construction of the project (Dunn). The architect and master builder were one in the same during Imhotep's time and that designation would continue and span much of

human history with architects like Ictinus and Callicrates, Brunelleschi, Thomas Jefferson, H.H. Richardson, and Frank Lloyd Wright all practicing as master builders (Grant 8-9). In serving as the architect, structural engineer, and general contractor for all of their project commissions, master builders were entitled to collect fees for each of these roles and entrusted with a level of design authority by clients that would allow them to coordinate the different trades effectively. Architects as master builders, were often able to enjoy a lifestyle of independence and creativity, designing freely while maintaining a high standard of living. However, this would change dramatically with the rise of the real estate development and commercial construction industries following the industrial revolution ("Real Estate Developers 20th Century").

In contrast to the architecture profession that dates back thousands of years, the real estate development profession as we know it today only began in the 1800s, during which time explosive United States population and economic growth fueled the need for developers of factories, warehouses, and housing (along with construction companies to implement the projects). This emergence of real estate developers and commercial contractors cannot be understated, as it fundamentally altered the client-architect relationship that had been in place for centuries prior, and began the devolution of the architecture profession. The role of developers during the 1800s (much as it is today) was to identify a need, partner with governmental and corporate entities, and develop an efficient solution to a manufacturing, warehouse, office, or residential need ("Real Estate Developers 19th Century"). In doing so, developers became intermediaries between clients and architects, and in cooperation with commercial contractors, effectively stripped construction responsibilities away from the master builder. The commercial construction company would go on to become the third entity in the client-architect-contractor organizational structure and occupy a preferred position over the architect. This new arrangement would prove to have ominous consequences for architects and the built environment as a whole with the rise of suburbia in the twentieth century.

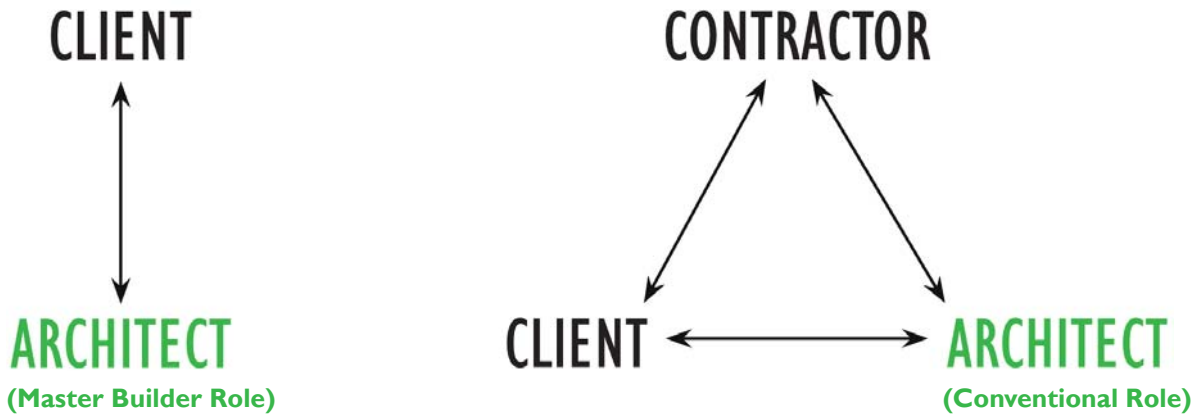


Figure 6 - Architect Role Diagram

The rise of suburbia following World War II was originated by developer William Levitt, who in 1947, opened the first of what became more than 17,000 Cape Cod and ranch houses located in once blighted potato fields forty miles east of New York City (Irwin). The development was named Levittown and it became the poster child of the American Dream; it also marked the point in history where architects were no longer the ones primarily responsible for shaping the built environment. The rapid expansion of the suburbs that ensued across the country was enabled by the rise of the automobile as the primary mode of transportation, the assembly line model of production that standardized building construction, and vast amounts of vacant land surrounding major metropolises, which served as a clean slate for developers to work with. This clean slate meant that suburban developments had no architectural precedents or surrounding contexts to measure up against, which gave developers and their construction companies' free reign to build quickly and cheaply to maximize profits without considering social or environmental consequences. There was no alternative form of suburban development at the time, so mediocre buildings and communities lacking architectural and planning sensibilities became the standard. Throughout this entire process, architects stood idly by watching their role diminish from master builder to line item expense for real estate developers.

Today, the real estate industry dominates both suburban and urban development patterns and maintains control over the building process, while architects find themselves with limited responsibility, little compensation, and virtually no design freedom. Architects have lost control over the building process by outsourcing the construction and engineering responsibilities of the master builder elsewhere, and with that, severed the strong architect-client ties that had existed previously. Architects no longer produce buildings, but rather provide a service for the developers and commercial contractors who do, which (as a business decision) has proven to be a catch-22 for the profession. The service-for-fee model not only prevents architects from profiting from the value added by their designs, but actually places them in an adversarial position with respect to the client, developer, and contractor by isolating them from the economic interests of projects. This is a bad spot to be in for architects, because the owner of capital, who in many cases is the developer, is legally and ethically responsible for controlling all design decisions and unlikely to concede that to someone that is viewed as an adversary (Grant 2). Architect-developer Jonathan Segal sums up the architect's dilemma, simply stating, "Control is everything and control is freedom" (Segal, "Architecture + Development"). Unless architects can find a way to regain control over the building process, they will never attain the design freedom that they desire and the quality of the built environment will suffer.

Fragmented Process

Despite the lofty vision, good intentions, and hard work of those who create our built environment,

the results often fall short. Suburban strip malls amid seas of asphalt, office buildings devoid of natural light and air, and tract houses denying individuality and comfort are sadly becoming the architectural vernacular in the United States. This problem, although manifested in buildings, is rooted in the process with the fragmentation of design, finance and construction activities. While the disciplines of design, finance, and construction are sound individually, the boundaries separating them as well as the project phases have inflated project costs, extended project schedules, and inhibited project quality. Consensus estimates suggest that as much as 30% of project costs are wasted due to poor management of the design-construction process (Elvin 200-201). The fragmented building process most often manifests itself in the form of value engineering, change orders, and litigation where many of the lofty visions and good intentions of project teams go to die.

Conventional Process
(Regressive: 'Tear-Down')

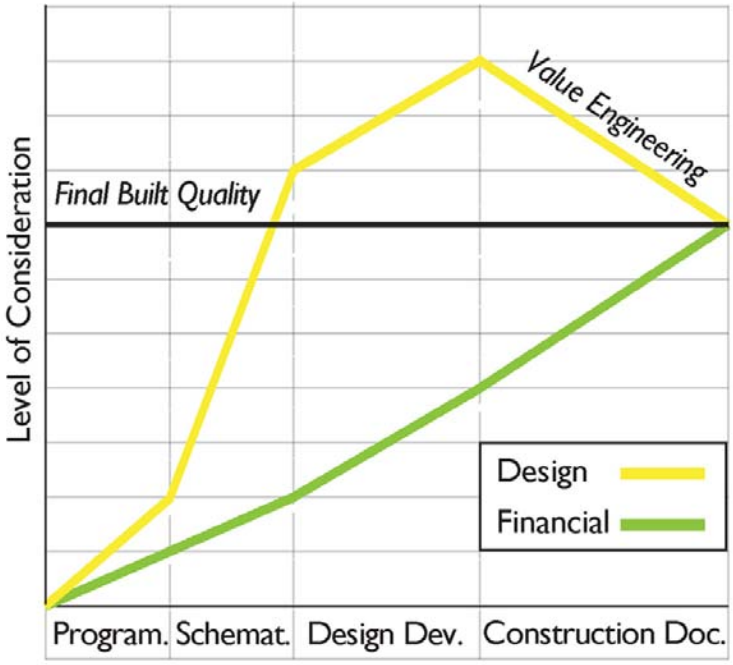


Figure 7 - Conventional Development Process Diagram

Architect-developer Michael Carroll of BUILD in Montreal recalls of his past dealings with this fragmented process, claiming, "I've worked in architecture offices, and found that everything tends to work down – by the time it's finished [the process] everyone wants to get away from it" (Sokol 22). The main source of frustration for architects is their inability to coordinate their design aims with a project's financial constraints, often resulting in the degradation of the original design intent to reconcile the difference. The degradation typically occurs following the design development phase when drawings, which have yet to consider costs, are sent out to bid for construction and discovered to be significantly over budget. At this point, the architect is pushed aside and the owner and contractor decide how they

will cut costs to bring the project in under budget. The architect has little say in what from his design will stay or go, and more often than not, the progressive design elements are the first to be eliminated from the final product. The architect might very well have alternative solutions for cutting costs that will not compromise the original design intent, but they are rarely considered due to the architect's lack of economic interest in the project.

Moving Forward

The origins of architecture are rooted in environment (shelter) and culture (monuments and places of worship), but with the emergence of the real estate industry, economics have become the tail that is wagging the architecture dog. Developers motivated by the economy-economy sector of the Sierpinski triangle currently control the building process and have replaced architects as the ultimate design authority. It is becoming clear that architects in their current capacity will never gain the design freedom necessary to facilitate triple top line development, which is of concern to architects like George Elvin who writes in his book *Integrated Practice in Architecture*, that "Our buildings shape us, and the quality of our surroundings has a tremendous impact on our quality of life" (Elvin 200-201). The world will be a better place if what we build is determined by designers educated and trained with culture, civic awareness, and aesthetic sensitivity, but architects need to step up and take on the additional risk required to control the building process for it to happen (Mau).

Part II: Solution

Chapter 3: The Architect as Developer

While architects are educated and trained to design cities with social, environmental, and aesthetic sensitivity, it is the real estate industry that is the major force shaping the built environment (Portman 7). Bruce Mau, one of the world's preeminent design thinkers, reinforces this point in a manifesto written for Icon Magazine and is very critical of how architects have failed to respond to this dilemma. Bruce Mau's "Manifesto #08" reads as follows:

> You probably do not want to hear this, but it is time we stopped talking about architecture. We need to get out of the gilded box we built ourselves into. We should be thinking about educating, training and celebrating developers. The challenges of the future are so much more complex and systems-based than the object culture architecture currently embraces. We need a new culture of responsibility and comprehensive engagement with long-term implications that can only come from broadening the base of architecture to include the design of the business models that generate most of the qualities we live within our cities. So long as architects self marginalize by purposely excluding the business of development and its real burden of complexity and decision making from their education, from their business, architecture will remain a gentleman's weekend culture, unwilling or unable to take on the heavy lifting and big problems, happy to polish fancy baubles for our urban environment.
>
> The business model for architecture is singularly unsuccessful. One in a thousand architects can afford to enjoy the pleasures that they are capable of producing for others. Architects accept enormous risks without the commensurate rewards. It is time, in this new millennium, to get dirty, to take on more of the scope of urban projects, to contribute more to a sustainable future and to participate in more of the wealth architects create. The world would be a better place if more or what we built in our cities was determined by people educated and trained with culture, civic awareness, aesthetic sensitivity and historical knowledge. I look forward to the first school of architectural development!

Bruce Mau's "Manifesto #08" is highly effective because it brings into focus a reality that many architects are unwilling to accept. Architects are not, and have never been responsible for shaping the built environment. That is not to say that master builders of the past did not have a great amount of influence on what got built, but even Imhotep ultimately had to answer to King Djoser for approval of

the first pyramid. That said, answering to a higher power is not really a problem when he is a patron of architecture who allows the architect to exercise a desirable level of design freedom in his building projects. Unfortunately, with the emergence of the real estate industry as the country's dominant builder, the number of individuals who have the power and the inclination to be patrons of architecture has become fewer and fewer. The key for architects moving forward, is finding ways to become their own patrons and that can only be accomplished through ownership (Portman 5).

Architects, by stepping up and taking responsibility for project financing as architect-developers, have the opportunity to eliminate the client and gain a level of design freedom that the profession has yet to experience. Understanding the Golden Rule of real estate (he who has the gold, makes the rules), the architect-developer position addresses many of the frustrations contemporary architects endure by increasing levels of responsibility, control, and compensation. This new master builder typology is dependent on architects increasing their knowledge base and taking on additional risks, but as Donald Grant notes in his book *The Small-Scale Master Builder*, "Freedom to design brings with it the assumption of the risks of design. It is through the ownership of capital that such freedom is gained, and it is in fact that very capital that, owned, is placed at risk in exercising the freedom that it brings" (Grant 3).

Increased Responsibility

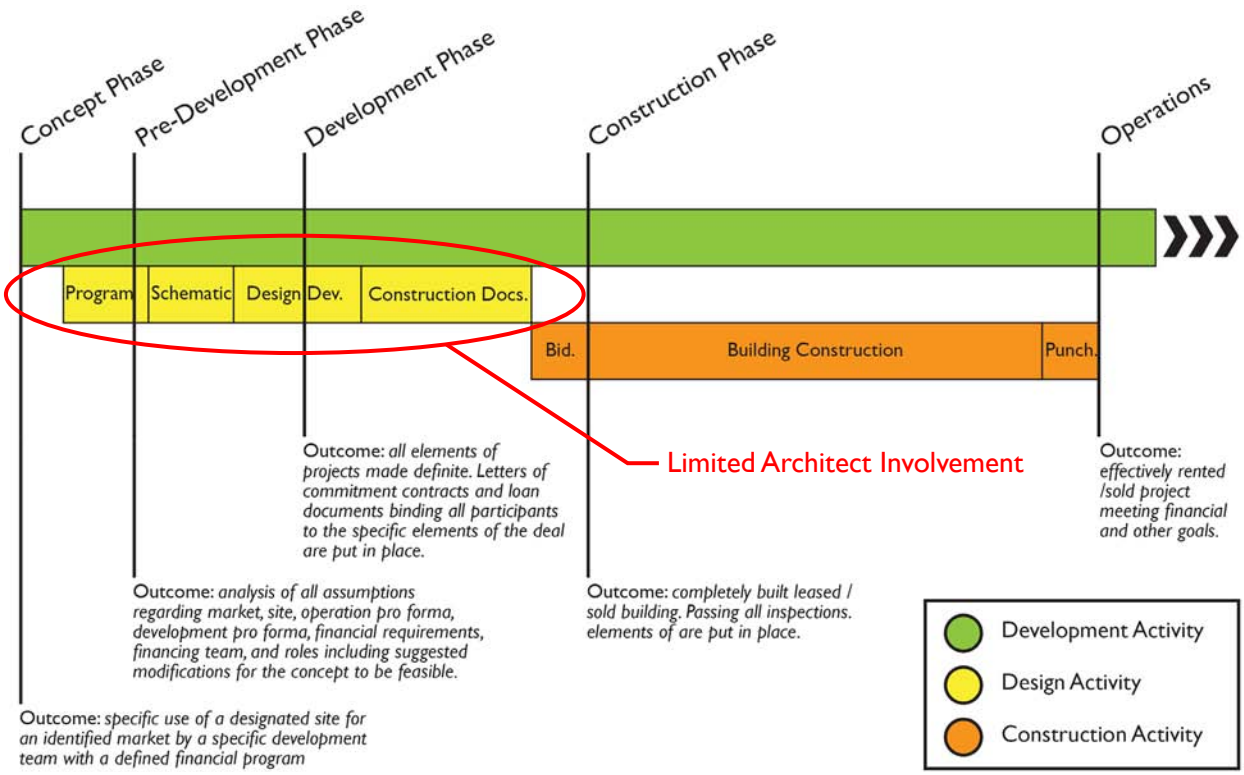


Figure 8 - Development Process and Architect Involvement Diagram

Today, many of the major design decisions for buildings take place before the architect even joins the project. Architects are seldom consulted about building location, size, or use, and the assumptions that developers or government officials make about the budgets tend to determine the structural systems and materials used. As a result, the scope of responsibility for architects is often limited to the translation of other people's decisions into technical drawings (Portman 4). This is not the case for architect-developers however, as the ownership of capital entitles them to authority over all design decisions from the beginning of the concept phase, all the way through the end of construction. While many architects find this increase in design control rewarding, it presents a unique set of challenges and a high level of accountability.

In the architect-developer approach to building projects, the designer is both the client and contractor, answering only to himself and the market for which he is designing. The architect-developer relies on different trades to help finance, build, and manage projects, but everything is coordinated through the designer from the start of design to the final certificate of occupancy. The buck stops with the architect-developer, and as a result, is accountable for all aspects of every job (Grant 5). The architect-developer has no clients or contractors to blame for mishaps and with pride of ownership working in his favor, has an incentive to produce a quality design exceeding that of his client-dependent counterparts. SHoP architects have found this to be the case in their architect-developer ventures, which have been equally punishing and rewarding according to principal, Greg Pasquarelli, who believes financially investing in their own projects has made SHoP architects even more demanding on themselves. "We're the hardest clients we've ever worked for," Pasquarelli says, "[but] I hope we never get paid a fee [from a traditional client] again" (Sokol 18).

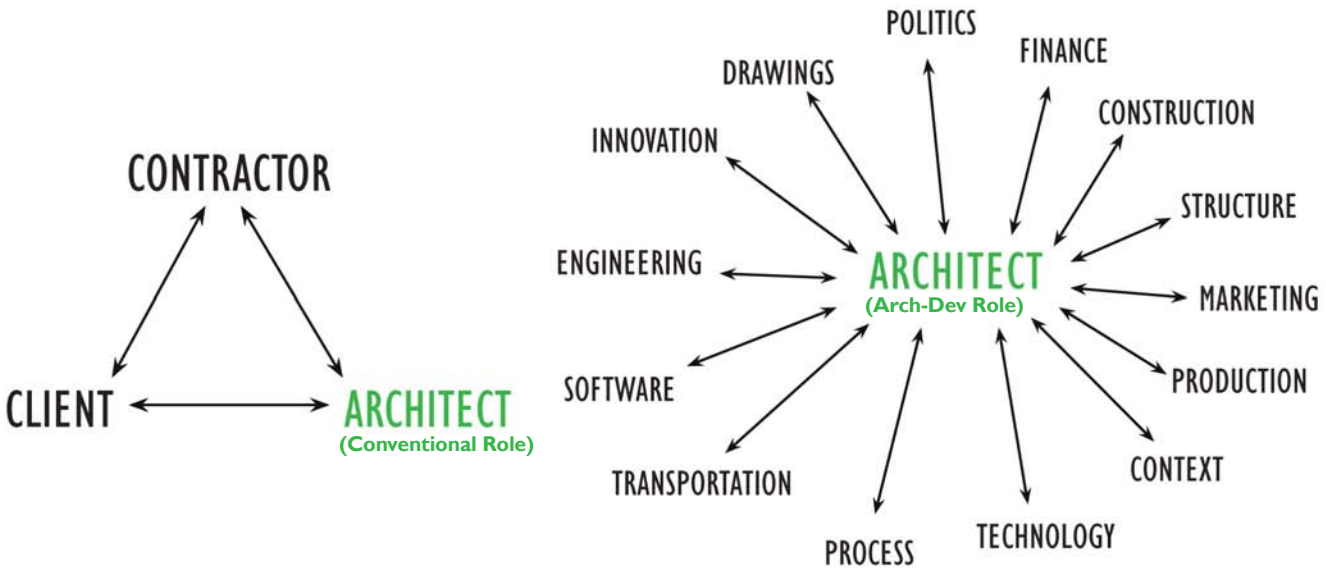


Figure 9 - Architect and Architect-Developer Role Diagram

The architect-developer role gives architects more power and influence over the design of the built environment than ever before, but with this, comes special ethical implications of practice that architect-developers must consider before moving forward with projects to avoid misbehaving for fun or profit (as many developers have done in the past). Architect-developer Donald Grant outlines ethical implications for both design activity itself, as well as overall goals to guide decision making. Some prescriptions and proscriptions for the design activity itself are:

1. To avoid degrading the environment for profit, or by taking on projects beyond your abilities, or for simple ego-gratification.
2. To avoid lowering the quality of human life at present and in the future for any reasons listed above.
3. To avoid lowering construction quality in order to maximize your own profit on a job.
4. To design and build in such a way as to contribute to the health, safety and beauty of the community.
5. To design and build in such a way as to add grace to human life (Grant 5).

Likewise, some overall goals and objectives that will guide decision making in addition to and prior to the setting of goals and objectives for each specific project are:

1. Design and build to conserve or improve the environment, and to enhance the quality of human life, and design and build only when there is a reasonable prospect that these will be the outcomes.
2. Design and build in order to realize some positive opportunity that you find in the environment rather than letting the opportunity go unrealized.
3. Design and build in such a way as to raise the average level of construction and improve the environment, rather than building at the code-prescribed minimum in order to cut costs and increase profit.
4. An attitude that differs in intent from the idea of building above minimum standards is to work towards more minimal standards, in order to use less resources and in order to make less costly housing available to more people (Grant 6).

The social and ecological aims for architect-developers outlined above are quite different from the purely economic goals driving the real estate industry. That is not to say that economic returns are

not important, but most architect-developers would rather leverage finances to develop environments of value to both the general public and investors, if possible (Portman 5).

The Architect-Developer Learning Curve

Architects are drawn to development for the increased responsibility, control, and compensation, but there are several hurdles that stand in the way, preventing architects from becoming successful architect-developers. First off, the development process is quite different from the architectural process in that it is much broader in scope and involves interactions with professions and professionals architects rarely deal with. Secondly, real estate development demands a level of financial and investment knowledge that most architects lack. Finally, undertaking development efforts requires an entrepreneurial mindset and risk-averse disposition that many architects are uncomfortable with and afraid to take on. Still, architects' talents as generalists make them as well qualified for the development process as anyone, and those who have been willing to educate themselves, change their mindset, and overcome these obstacles have experienced great success as architect-developers (Miller 16).

The first hurdle architects must clear on their way to becoming architect-developers is situating themselves within the larger context of real estate development, beginning with the organizational structure of the development team. It is not only important to be able to identify all of the team members, but to understand what each of the players (including the developer) is individually responsible for. This is important because as a developer, the architect will be responsible for selling the project proposal to team members, negotiating contract agreements with team members, and ultimately, managing the team members. The organizational structure for a standard development team consists of eleven primary players, not including the architect and his team, whereas the architect in his traditional role typically only deals with two, the developer and the general contractor (Miller Appendix B 13). The following list identifies all twelve team members along with who they deal with and what they are responsible for. The list is in sequential order reflecting when each player enters the development process.

Members of the Development Team

- The Developer: The developer wears multiple hats throughout the development process. He is the team captain responsible for selecting the team, knowing each member's duties, and delegating the proper authority to each. He is an entrepreneur and risk taker who possesses the confidence to succeed, but also the humility to understand his limitations. The developer is a salesman that must convince lenders, investors, and other players to commit their money, time, and efforts to his vision. Finally, the developer is an organizer and manager who is responsible for assembling the development package and overseeing its follow-through.

- The Marketing Consultant: The marketing consultant assists the developer in analyzing the market to determine needs and the right project type to meet the demand. He provides preliminary projections of income and expenses, development costs, as well as trends in financing and lending requirements. During construction the marketing consultant will assist in developing a marketing program for the property and will follow-up with management upon project completion.

- The Real Estate Broker: The real estate broker's main duty is to serve as an intermediary between buyers and sellers of real estate. In the beginning of the process, he assists the developer in finding a site and purchasing the property. The broker may also provide financing assistance by helping to identifying equity investors and other sources of capital contributions for a project.

- The Architect: The architect selects and coordinates the design team, which typically consists of engineers (civil, structural, mechanical, and electrical), interior designers, landscape designers, planners, and consultants. He is the primary design liaison for the developer and is responsible the planning and execution of schematic design, preliminary cost estimates, final plans and specifications, final cost estimates, construction bidding, and inspections. The architect also helps the developer sell the project through renderings and models.

- The CPA: The Certified Public Accountant (CPA) helps establish an ownership entity for the project by advising the developer on the proper structure and its tax benefits. The CPA will also review the prospectus for lenders and investors with regards to their conformance with recognized accounting procedures and tax considerations acceptable to the IRS. Finally, he will provide consultation after completion of the development by preparing annual statements for lenders and investors, as well as annual tax returns.

- The Attorney: The attorney, who should be experienced in real estate law, will aid in establishing an ownership entity for the project from a legal perspective, mostly dealing with liability issues. He will also help prepare and review all documents ranging from loan agreements, to professional contracts, to leases and sales agreements.

- The Investors: The investors provide the initial equity capital required for a development project as well as additional capital as needed. Investors will often demand a specific rate of return and will review the ownership structure and project prospectus before committing any resources. Investors might be individuals, partnerships, corporations, lenders, or the developer himself.

- The Mortgage Broker: The mortgage broker works with the developer to find a permanent lender to finance the development once construction is complete and also helps to negotiate the terms of the permanent loan. Most construction lenders require a permanent loan to be in place before granting short-term construction loans for projects, thus necessitating the involvement of the mortgage broker relatively early on in the development process.

- The Banker: The banker typically furnishes the interim or construction loan. He will almost always require the developer to have a permanent 'take out' loan secured before extending credit, and is often from a regional bank with some insight into the local real estate market.

- The General Contractor / Builder: The general contractor is responsible for the actual construction of the development itself. He uses the drawings provided by the architect to bid out the cost of construction to various sub contractors and will determine the necessary budget based on their quotes and internal estimates. The general contractor assumes much of the risks associated with cost overruns, and works closely with the developer to manage costs throughout construction.

- Public Relations / Advertising: The public relations and advertising team assists the developer in the advancement and implementation of the marketing program originated by the marketing consultant. The marketing program may include print and media advertising, signage, model units, and on-site events to attract future tenants to the development. The public relations and advertising team will also be responsible for training rental agents and sales personnel for the project.

- Management: Management is responsible for operating the property and maintaining its profitability upon completion. Management will market the property, collect rents, perform maintenance, and deal with tenant issues. They may be located on site or in a central office depending on the project type.

For architect-developers, and developers wishing to cut costs by assuming additional roles in the process, the organizational structure will be somewhat altered, still, all of the duties outlined above must be accounted for in some way if a development is to succeed. Having developed an understanding for the various players involved in the real estate development process, the next step for aspiring architect-developers is to understand the development process itself. The following list breaks down real estate development into eight different stages, and while not the only way to delineate the process, the essence of the steps does not vary significantly from other models.

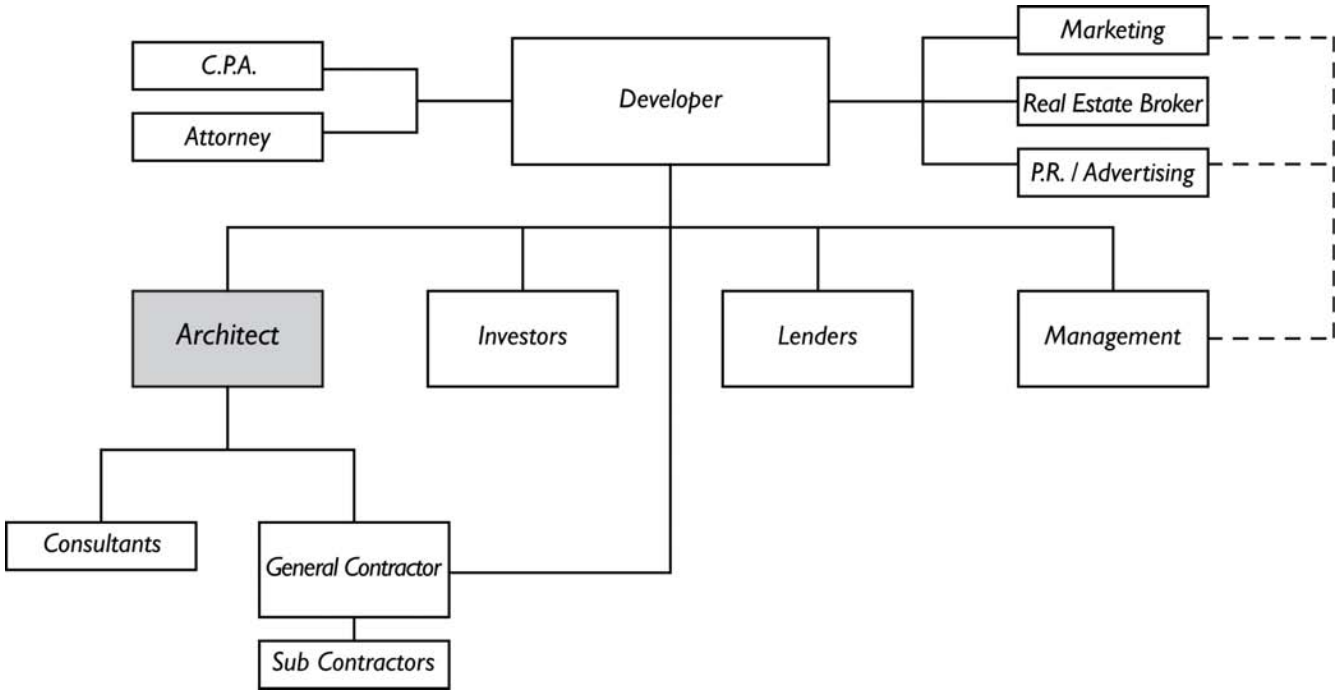


Figure 10 - Traditional Team Organizational Chart

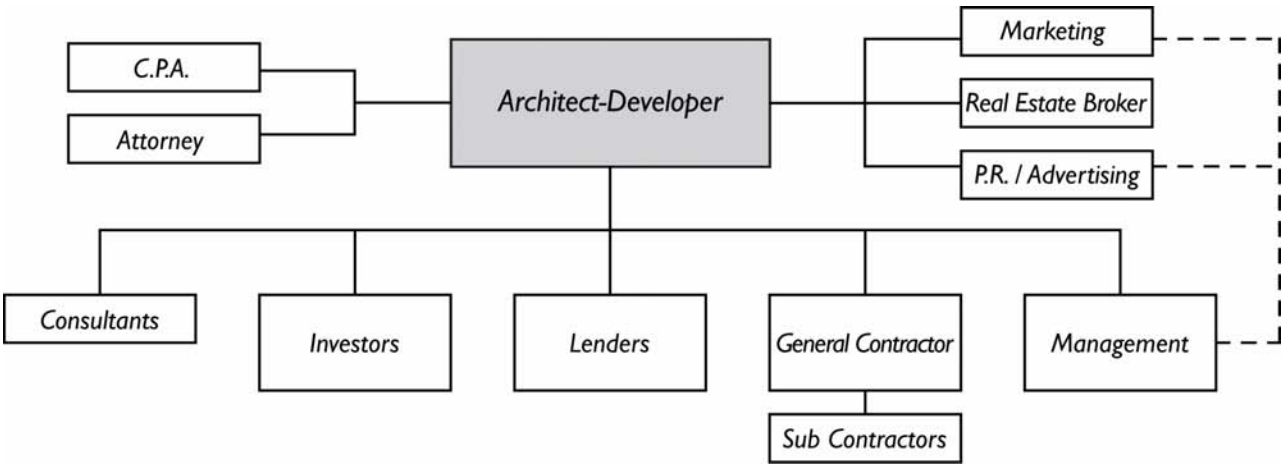


Figure 11 - Architect-Developer Team Organizational Chart

Eight-Stage Model of Real Estate Development

1. Inception of an Idea: The developer, with extensive background knowledge and a great deal of current market data, looks for various needs to fill in the market, sees some of the possibilities, has about a dozen ideas, and runs them all through quick feasibility tests in his head.

2. Refinement of the Idea: The developer finds a specific site for one of his ideas, examines its physical feasibility, and talks with prospective tenants, owners, lenders, partners, and professionals about the idea. He settles on a tentative design and options the land if the idea looks good.

3. The Feasibility Study: The developer conducts or commissions a formal market study to estimate market absorption and capture rates, then conducts or commissions a feasibility study comparing the estimated value of the project with the costs. He moves forward, processing plans through government agencies and demonstrates legal, physical, and financial feasibility for all potential participants.

4. Contract Negotiation: The developer decides on a final design based on what the market study says users want and will pay for, negotiates contracts, and gets a loan commitment in writing. He decides on a general contractor, determines the general rent or sales requirements, and obtains permits from the local government.

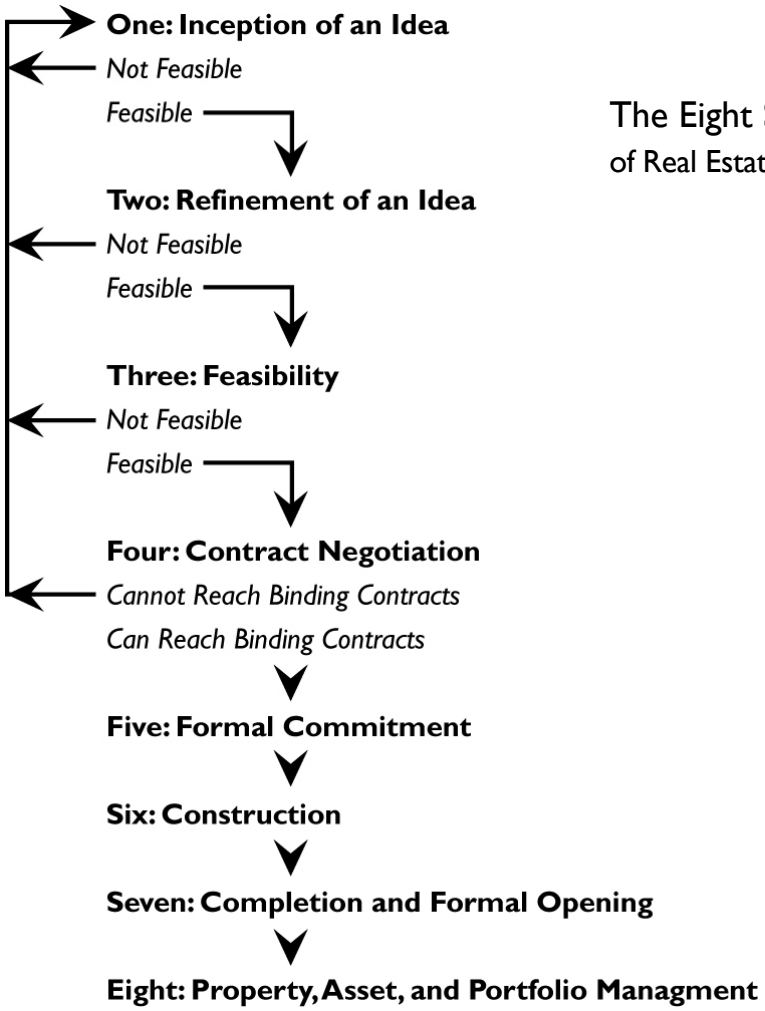
5. Formal Commitment: The developer's contracts that are contingent on the endorsement of other contracts are often all signed at one time. These contracts include (but are not limited to) the joint venture agreement, the construction loan agreement and permanent loan commitment, the construction contract, the exercise of the land purchase option, the purchase of insurance, and the pre-lease agreements.

6. Construction: The developer switches to a formal accounting system to help keep costs within budget and approves various changes suggested by marketing and the development team. He resolves construction disputes, signs checks, keeps work on schedule, and brings in operating staff as needed.

7. Completion and Formal Opening: The developer brings in a full-time operating staff and increases advertising efforts as utilities are connected, the project is approved for occupancy, and tenants begin to move in. The developer proceeds to pay off the construction loan and close on the permanent loan.

8. Property, Asset, Portfolio Management: The owner (either developer or new owner) oversees property management (including re-leasing), reconfiguring, remodeling, and remarketing spaces as necessary to extend the economic life and enhance the overall performance of the asset. The corporate management of fixed assets and considerations regarding investors' portfolios determine the ultimate exit strategy for the project (Miles 6).

The development process, while expressed in a linear fashion, is hardly straightforward in its implementation. Developers are constantly repositioning themselves within the process as they learn more information, generate new ideas, and renegotiate with project participants. Development is an art that is both creative and complex, that is part logical and part intuitive, and there is no 'right' way to maneuver through the process. That said, it is important that developers consider all future stages of development when making current decision as to not interfere with the long term goals of the project. As a result, the development process requires interaction among the different functions (construction, finance, management, marketing, and government relations) that interact in each of the eight stages as well as over time (Miles 5).



The Eight Stage Model
of Real Estate Development

Figure 12 - The Eight Stage Model of Real Estate Development

Understanding what developers do, who they collaborate with, and the development process itself is a critical first step for architects on their journey to becoming architect-developers. However, to

actually do what developers do, they need to achieve a level of financial and investment knowledge most architects lack. This primarily pertains to gaining an understanding for how to put together and analyze a project *pro forma*, a comprehensive financial statement that is required for every development. The following is a basic introduction to the project *pro forma* and its components.

The Project *Pro Forma*

- Definition: A *pro forma* is a financial operating statement that projects how a project will perform for a future period based on a set of specific assumptions. To create a *pro forma*, a developer must determine a project's expected income, costs, and financing structure.
- Significance: The project *pro forma*, like the developer himself, performs multiple functions throughout the development process. At every stage, the *pro forma* organizes, sells, or evaluates the performance of the development, and accounts for individual player involvement along the way. The *pro forma* is the primary indicator of future project success and is required to obtain any type of construction loan or permanent financing.
- Assumptions: Of necessity, the *pro forma* is composed based largely on assumptions. Rents, lease-up rates, occupancy rates, operating expenses, construction costs, and interest rates must all be forecasted and slight changes in any of these assumptions can result in major differences in the bottom line. Therefore, it is critical that the developer consults with his team of professionals, practices proper due diligence, and is as accurate as possible when generating project estimates.
- Components: The forecasted operating statement, forecasted project costs, and forecasted financing make up the core components of the project *pro forma*.
    - The forecasted operating statement shows the income, expenses, and net operating income.
    - The forecasted project costs show the land costs (the fair market value of the raw land), hard construction costs (the actual construction costs to erect the building, including site preparation), and soft costs (the architectural, planning, engineering, permitting, financing and marketing costs).
    - The forecasted financing shows the requested loan amount, the required equity contribution, and the final project value.
- Process: In preparing the *pro forma*, the developer first determines income from rents and

auxiliary sources less vacancy and collection losses. He then deducts operating expenses for management, maintenance, taxes, etc. to arrive at the net operating income (NOI) for the project. Moving forward, the developer figures out how much money he must borrow to finance the project by estimating the total development costs, which consists of land costs, hard construction costs, and soft costs. Next, the developer works with lenders and investors to determine the overall financing structure along with the monthly debt service (mortgage payment) required to pay for the development. This debt service amount is subtracted from the NOI to arrive at the before-tax cash flow for the project, which is later evaluated by the developer and his team to determine if the *pro forma* meets their investment demands. If so, the development process will move forward, if not the developer must go back and find alternative ways to make the project feasible (whether through grants, value engineering, tax credits, etc.). If the *pro forma* still falls short, the developer should start to consider his exit strategies for getting out of the project (Collier 106-137).

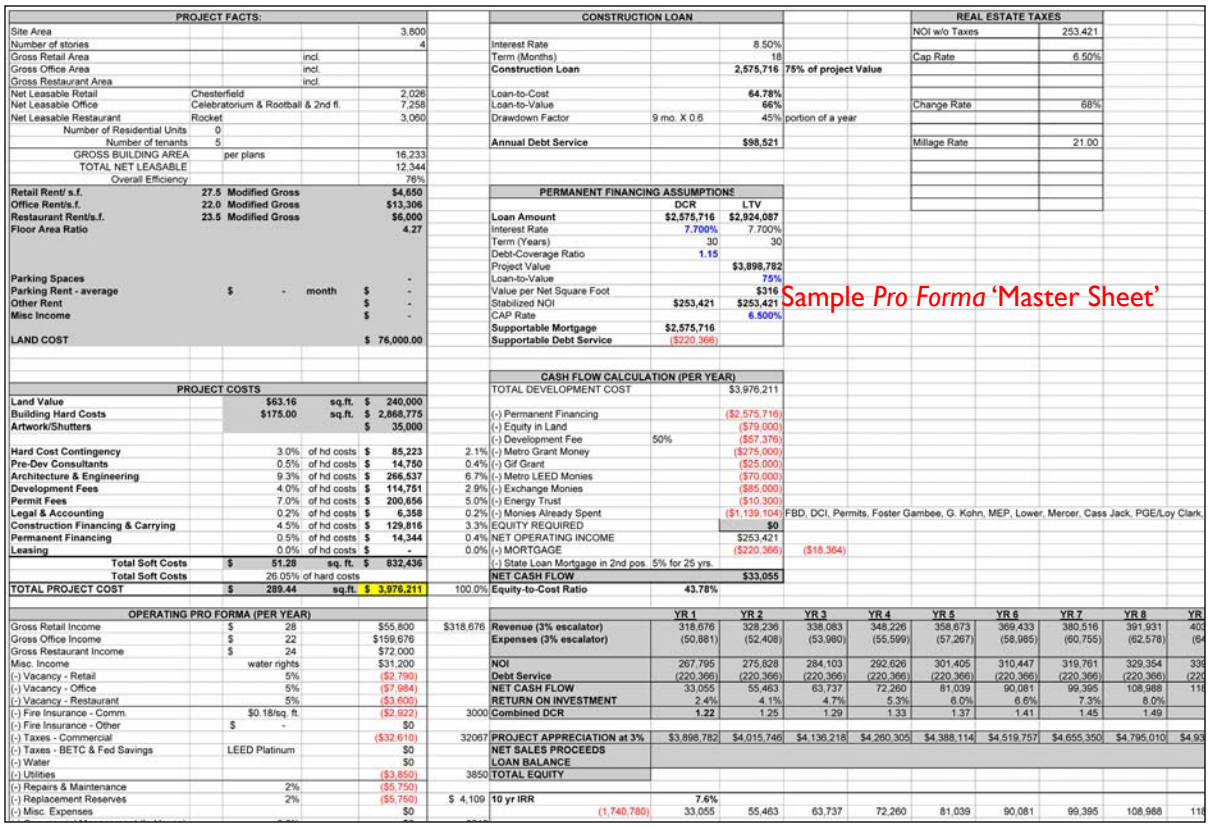


Figure 13 - Sample Pro Forma Master Sheet

Once architects have developed enough financial and investment skills to compose and analyze a project *pro forma* effectively, they will have acquired all the knowledge necessary to become successful

architect-developers. However, that transition will not be made complete until architects initiate their first development project. This is the final and most challenging hurdle architects face on their journey to becoming architect-developers, and where many fall short of their aspirations, paralyzed by fear. Taking that leap of faith to get started requires architects have an entrepreneurial mindset, willingness to take on risks, and confidence that they are going to succeed. Those who do, will ultimately benefit from the increased design control and compensation architect-developers experience, and those who do not, will not.

Increased Design Control

Architect-developers, by controlling project financing and holding ownership of real property rights, are entitled to the ultimate design authority and the freedom to design that architects, obstructed by clients and contractors, can only dream of. Unlike their client-dependent counterparts, architect-developers are not in a position where they need to devote valuable time and resources crafting arguments just to convince owners to go along with design decisions that are not the government standard or cheapest solution. Instead, they can focus all their efforts on designing the best building possible and aligning it with project and overall goals. The increased design control also allows architect-developers to exert their design influence over more stages of the building process than what architects are accustomed to dealing with. Whereas, the typical architect's scope of work begins only after a site has been located, a program has been selected, and square footages determined, the architect-developer has the final say in each of these decisions, which has a dramatic effect on the overall character of the development. On a similar note, the architect's scope of work is mostly complete before construction on projects even gets started, resulting in many of the on-site design decisions being made by owners and contractors, whose design sensibilities are quite different than those of the architect. The architect-developer, on the other hand, is not only able to supervise and manage these on-site design decisions, but also initiate design changes over the course of construction if superior alternatives are found. Architect-developers are not necessarily better designers than their architect counterparts, but they are in a much better position to see their design intentions manifested in built-form, which is arguably more important when shaping the built environment.

Increased Compensation

While the 'starving artist' role tends to get romanticized in literature and academia, it is not the preferable position for architects with families to feed, bills to pay, and high-end design tastes to be in. Award-winning architect-developer Cary Tamarkin recalls of his money struggles as an architect saying, "I appreciated that my life had been devoted to making art, but I was walking around all day thinking about the fact that I'm making no money. There was no way I was going to spend my life as a starving artist"

(Sokol 28). That is not to say that all architects are 'starving' and no one can make a decent living being an architect, but an architect-developer will often make more off the sale of one small-scale development than what an architect will make in five or ten years of practice while exercising more control over design (Elkies). This vast difference in earning potential is due to the fact that architects provide a service for a one-time fee, whereas architect-developers provide a product with residual income, leveraged with other people's money (OPM). The following paragraphs offer more detailed explanations as to how architects and architect-developers are compensated for their efforts.

Architects make money by selling their services to clients for a set fee, typically based on a percentage of construction costs. They are paid the same fee regardless of whether developments make or lose money, which means they have no financial interests in the projects they design. They assume none of the financial risks carried by developers, investors, and contractors in development projects, and as a result, share in none of the financial rewards. This no risk, no reward business model requires architects to work strictly on commissions like brokers, bankers, and market consultants, with the caveat that architects' services are not perceived by owners to directly translate into economic value, Unfortunately, this perception has resulted in architects earning significantly less for their efforts than their real estate counterparts, leading them to question; How did architecture get to a state where everybody but the architect is making money from real estate development? The problem is that in real estate, perception is reality and many owners perceive architects as unimportant, interchangeable, and willing to work on the cheap. For owners and developers, the people who control, or appear to control money issues, are considered important. Architects are not important because they are not viewed as people who control money flowing into projects and in fact, are often viewed as liabilities who effect costs in a negative way. Owners often cannot even distinguish good architecture from bad, leading them to give most of the jobs to the cheapest architects and forcing designers to undercut each other in bidding wars until they are practically working for free. Surprisingly, many architects tolerate this self-destructive behavior, with one Perkins + Will architect adding, "It seems we [architects] are so grateful to be allowed to do what we went to school for, that we will put up with almost anything" (Miller Appendix I 2-3).

Architects working for fees (let alone low fees) is problematic, because in addition to working on projects at hand, they must also devote attention to marketing their services to potential clients for future commissions. Architects are very dependent on booms of new construction to maintain profitability, meaning their livelihoods are extremely vulnerable when there are downturns in market conditions and building slows. This was proven in 2009 when architects lost more jobs to the recession than any other profession (Tahmincioglu).

Like architects, architect-developers are still able to collect architect fees and even higher grossing

developer fees if they so chose, but their primary compensation is in the 'surplus value' of the development projects themselves. Most architect-developer projects are highly leveraged with other people's money (OPM) to first finance development costs (through construction loans), and later the building projects themselves (through permanent loans). The construction loans are considered short-term and are paid off at project completion by long-term permanent loans. These permanent loans are often secured by mortgages, and just like a house, paid down in monthly installments that include both principle and interest. The money used for these payments comes from rents and other sources of income that developments generate, and whatever money is left over after accounting for these payments, taxes, insurance, and other expenses is the surplus value that goes to compensate architect -developers. In short, the surplus value is the difference between direct costs and the market value produced by projects, meaning it can be increased by finding ways to lower direct costs and/or increase market value for projects (Grant 27).

Architect-developers have the opportunity to increase the surplus value of their projects by lowering direct costs, which include land costs, labor costs, and material costs. In terms of lowering land costs, architect-developers often elect to develop cheaper, oddly shaped 'throw away' lots that scare off traditional developers, but intrigue architect-developers as creative design opportunities. In terms of lowering labor costs, architect-developers often forego collecting both architect and developer fees and instead, reinvest them into the project as equity financing. Finally, in terms of lowering material costs, architect-developers have the opportunity to design projects that make more efficient use of materials, reuse existing structures, and spec materials that are easier to process and assemble.

Architect-developers also have the opportunity to increase the surplus value of their projects by increasing market value, which consists of value added by design and market appreciation. In terms of value added by design, architect-developers have found that projects that are more aesthetically pleasing, humanizing, and environmentally sensitive than what is standard, have experienced less vacancy and also commanded more in terms of rents and sales. Unlike design, market appreciation is a factor largely outside of the control of architect-developers, but is often the largest source of surplus value in real estate. It is not unusual for developments located in areas where land values are climbing, to see their total market value jump 50%+ over the course of their holding period, all of which is surplus value.

Architect-developers do not work for money, instead they make money work for them. Once architect-developers complete a project, they continue to receive a stream of rental income from the property until it is sold or exchanged to finance a larger development that will generate even more income. As architect-developers complete more projects, they accrue additional sources of residual income, building not only a portfolio of work, but of investments that can eventually be sold for big profits. Speaking to this point, architect-developer Jonathan Segal, FAIA recently sold 75% of his development

portfolio for $45,000,000, showing architects-developers can both do good, creating award-winning works of architecture, and do well, making money from design (Architect as Developer).

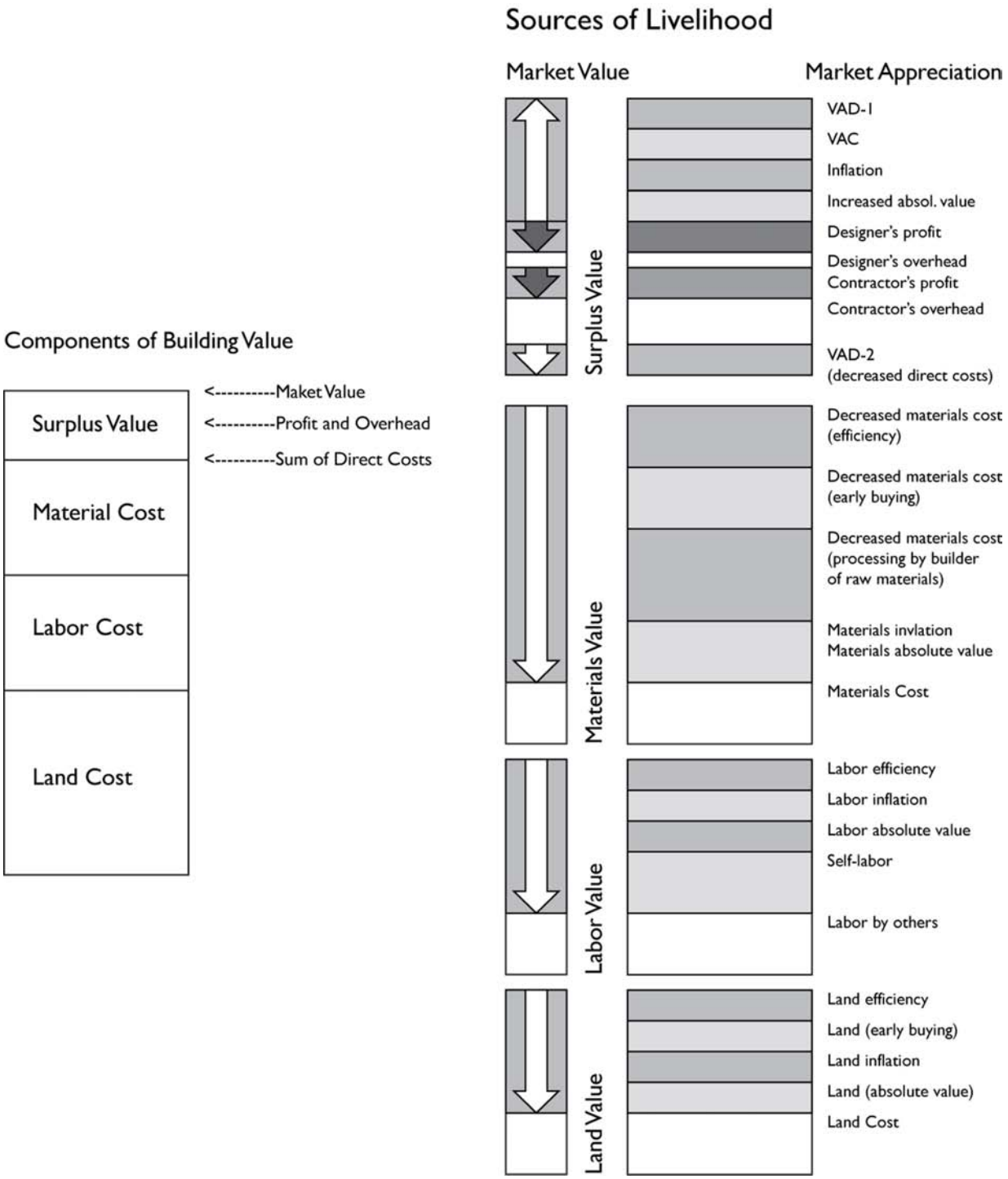


Figure 14 - Surplus Value Diagram

Chapter 4: Triple Top Line Development Reconsidered

Developments that embody triple top line design thinking enhance the well being of both project shareholders and stakeholders by creating buildings that are diverse, safe, healthy and just environments to be economically, equitably, ecologically, and elegantly enjoyed (McDonough, "Inspiration"). Unfortunately, very few triple top line projects exist due to the restrictions imposed by the fragmented interests and processes behind most real estate developments. At the heart of this fragmentation is the inauspicious relationship held between architects and developers, which implies that some sort of reconciliation amongst the two would go a long way in ultimately integrating the interests and processes of development. It is clear that with the power advantage developers enjoy over architects that this reconciliation will not come through avenues of negotiation and compromise, rather it will hinge on architects stepping up and assuming the role of architect-developer on projects. With the architect and developer being one in the same, so too, will be their interests, and integrated interests facilitate integrated processes, which are necessary for the execution of triple top line development projects.

Integrated Interests

For triple top line development to happen, the key players on the development team (namely the architect and developer), must first be compelled to take appropriate actions. In other words, both parties must be equally motivated to create an economic, ecological, and social asset if they expect that to be the end result of their efforts. Regretfully, neither architects nor developers are motivated by all three values, as their professional and academic training and incentives are more narrowly focused. For architects, the greatest incentives for recognition both academically and professionally, are through the design of socially and ecologically progressive work. Up and coming architecture students are rarely, if ever, instructed to think about the financial ramifications of their designs in studio, and instead evaluated strictly on their ability to generate an innovative design concept and 'make it sustainable'. This value system translates to professional practice as well with architectural publications and awards directed at the most provocative building forms and 'greenest' projects rather than the most economically successful. That is not to say that valuing the social and ecological performance of projects is not valid, but architects need to recognize that certain economic thresholds must be met for any project to move forward, even if it is at the expense of social and ecological considerations. Many architects fail to meet this minimum economic threshold in their initial design efforts, which forces developers, with the aid of their contractors, to reconcile the difference while being guided by a completely different set of motivations.

Unlike architects, real estate developers' greatest incentive for recognition is the economic performance of their projects. Whereas the most well known architects like Frank Lloyd Wright, Mies Van Der Rohe, and Frank Gehry are instantly identified by and celebrated for the buildings they produce, the most well known developers such as Donald Trump and Gerald Hines are identified by and celebrated for the power and wealth that their buildings have afforded them. Essentially, the fundamental difference in motives between architects and developers is that while architects (through a social and ecological lens) view buildings as the end, developers (through an economic lens) view buildings as a means to an end. This is why developers rarely hesitate to push the architect aside in order to quickly cut costs and maximize up-front profits through value engineering. What is interesting though, is that the most well known architect-developers like John Portman and Jonathan Segal are instantly identified by and celebrated for the buildings they produce, despite wielding great power and wealth. This suggests that architect-developers are incentivized by both the means and the ends that is development, viewing buildings as socially, ecologically, and economically significant. Coincidently, such incentives are in direct alignment with the economic, ecological and social considerations that make up the triple top line design thinking.

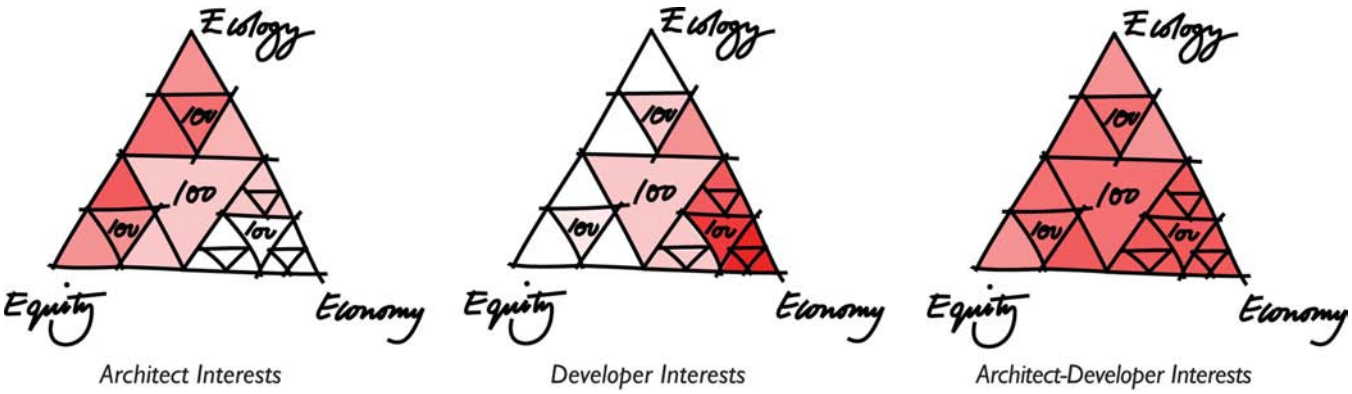


Figure 15 - Integrated Interests Diagram

The variety and balance of incentives motivating architect-developers to facilitate triple top line development is exceptionally rare for a single profession and stems from the architect-developer's combination of architectural training, which stresses the environmental and cultural value in buildings, and real estate development training, which stresses the economic value in buildings. This dual knowledge and perspective allows architect-developers to think of real estate architecturally and architecture entrepreneurially, which is a great tool for synthesizing decision making throughout the development process and pre-requisite for utilizing the Sierpinski tile as an effective design tool (Portman 4). Establishing integrated interests will facilitate an integrated design-develop-build process, which is a near impossible feat for development projects utilizing the standard developer-contractor-architect structure.

Integrated Process

In addition to integrated interests, triple top line development is also contingent on an integrated development process. The traditional development model fails to deliver an integrated process on multiple fronts, but can be traced back primarily to the failure of getting the right people on the bus before beginning a project and the costs of communication between the architect, developer, and contractor. Fortunately, the architect-developer model is immune to such problems, facilitating a level of integration and flexibility throughout the process that allows the architect-developer to constantly align and re-align design decisions with the key values identified in the Sierpinski triangle.

In the best-selling business book, *Good to Great: Why Some Companies Make the Leap – and Others Do not*, author Jim Collins notes that in beginning any business venture, real estate development included, the key to success is to first get the right people on the bus, and then decide which direction to go in (Collins 41-64). In other words, the 'who' questions should always be considered before the 'what' decisions. This is in complete contrast with the traditional real estate development process, in which architects are not brought on to a project until after decisions about building location, size, and use have already been made (Portman 4). Entering a project this late in the game not only prevents the architect from consulting on critical design decisions early on, but perpetuates the view of the architect as an 'outsider', which complicates communication throughout the development process.

David Sokol, author of *Property Development and Progressive Architecture*, writes that one of the keys for any successful development project is for architects, developers, and contractors to be able to communicate effectively with one another throughout the design and construction process. Unfortunately, 'archispeak' (the language of architects) is much different than developer speak and contractor speak, meaning that much of the architect's time and energy must be devoted to translating his work into a format that both developers and contractors can understand (Sokol 39). This is what architect-developer Donald Grant refers to as the costs of communication, and is described as follows.

> Two major areas of cost incurred by the designer are the costs of communication and control between owner and designer and the costs of communication and control between designer and contractor. The costs of communication and control between designer and owner take the form of information gathering about the owner's wishes and needs, the presentation of the designer's intents in forms the owner can understand, and the production of a sufficient number of proposals to gain the owner's approval. The costs of communication and control between designer and contractor are in the form of construction documents in sufficient detail to stand up in court as being legally binding on the contractor. Such documents are often an order of magnitude more costly than the set

> of documents that would be necessary simply to carry out construction. The costs of the two activities described above are in the form of money (the designer's overhead) and… become so all-consuming that the architect who hoped to be a designer never has time to design (Grant 20).

The cost of communication is detrimental to triple top line development because it prevents designers from having the time and flexibility needed to constantly align and realign design decisions with project goals and overall values embodied within the Sierpinski triangle. Instead, the alignment of social and ecological considerations with economic decisions is pushed back to the end of design development and controlled exclusively by the contractor and developer in the regressive (work down) process of value engineering.

In contrast to the fragmented process of the traditional development model, the architect-developer model (backed by unified interests), facilitates an integrated development process, which is key for triple top line development. The architect-developer process is a build-up approach with the architect on board from the very beginning when project and overall goals are first established, situating the development in a larger economic, ecological, and social context. This allows for architect-developers to select and evaluate the location, size, and use of projects based on more than just the economy-economy grounds that developers make such decisions on. Furthermore, the architect-developer as the ultimate design authority is not inhibited by the cost of communication that most architects are forced to deal with. This allows architect-developers to focus all their efforts on actions directly related to the design and betterment of the building project itself, as opposed to wasting time producing excessive design proposals again and again just for owner approval and extraneous legal reasons. This control over design also affords architect-developers the freedom to constantly align and realign design decisions with economic considerations and other values inherent in the Sierpinski triangle throughout the design-develop-build process, which effectively eliminates the need for value engineering. As such, the overall quality of design is progressive (constantly improving), rather than regressive (compromised before completion). Architect-developer Michael Carroll, co-founder of BUILD in Montreal elaborates on this progressive 'build-up' approach as it relates to his own work, commenting:

> I think we really emphasize the idea of building from the ground up. The design is very much based on logistics and pragmatics, and bylaws and those kinds of things that everybody is dealing with. But I think we start with the least we can do, and what is absolutely essential, and how we can develop the project so that it works economically and we can do something interesting in terms of design. So it's very kind of base-level, and then we work up, which is kind of refreshing because the project always gets better [rather] than worse (Sokol 24).

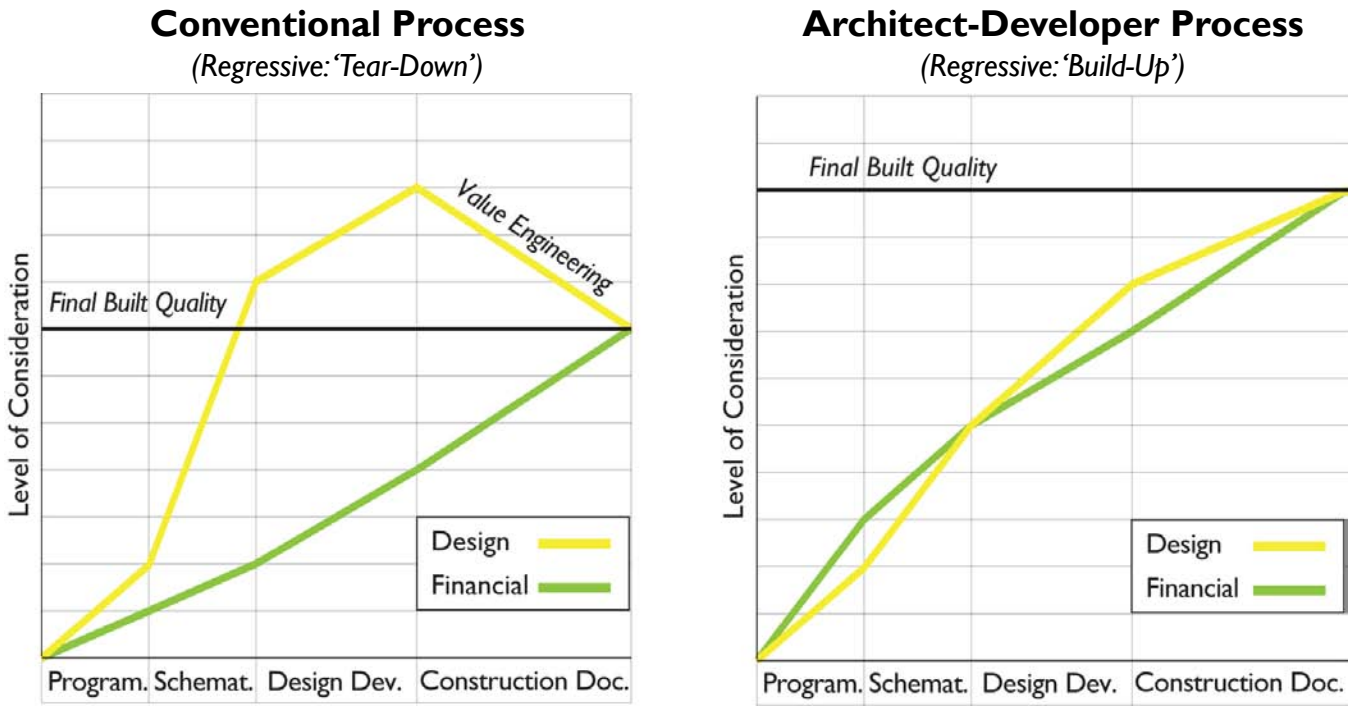


Figure 16 - Conventional vs. Architect-Developer Process Diagrams

Integrated interests and an integrated process serve as the means to the end that is triple top line development. The architect-developer model provides a structural framework for the consistent delivery of such developments, with the specific quality and character of individual projects varying based on context, and the values and goals of the architect-developer and his team.

Part III: Outcome

Chapter 5: Triple Top Line Developments

The outcome of triple top line development is a project that is at once an economic, ecological, and social asset. However, the extent to which each asset is developed is dependent on the overall context in which the project is situated and the motivation of the architect-developer. For example, if a project is located in an appreciating market and the architect-developer is motivated by making a high profit to help finance other projects, he will look for ways to maximize the economic value of the project. This will primarily be achieved by basing design decisions in the economy sector of the Sierpinski fractal, but enhanced by considering ecological and social considerations that will provide additional benefits to the financial bottom line. For instance, ecologically, the adaptive reuse of an existing building may reduce development costs and increase marketability, while socially, the inclusion of affordable units may permit a density bonus allowing for additional units to increase cash flow.

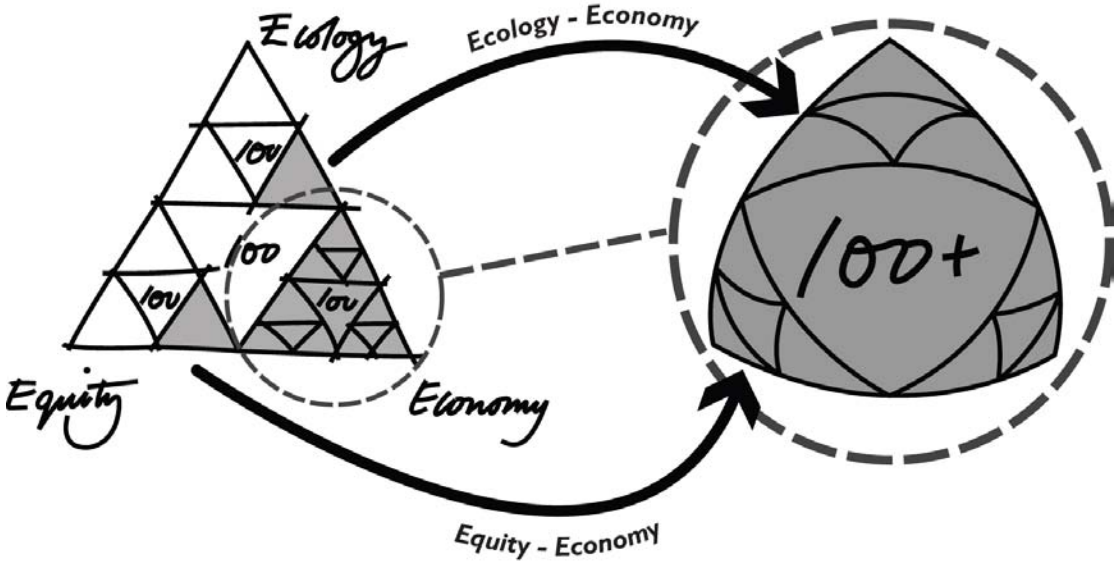


Figure 17 - Triple Top Line Spillover Effect Diagram

The Union: Economically Driven Triple Top Line Development

Located in the Golden Hill neighborhood of San Diego, the Union is an award winning mixed-use project developed by architect-developer Jonathan Segal. The property is composed of thirteen (for rent) town homes and a commercial office space that is an adaptive reuse of an existing union hall. The site itself was in disarray when it was put on the market, keeping its acquisition cost low and making it appealing to Segal and others who

saw the opportunity to turn a profit through its development. The project's high economic potential led Segal's design decisions to be based primarily around ways to maximize surplus value, but not only through economic means, as ecological and social considerations also made significant contributions to the end product.

Figure 18 - The Union, San Diego

Architect-developer Jonathan Segal leverages design to maximize economic value by recognizing (1) people will pay more for good design, and (2) good design does not need to cost more, and can often cost less than conventional construction. The Union, which is close to jobs and in a walkable neighborhood, contains modernist, light-filled volumes with private outdoor spaces and elegant detailing tenants pay premiums for, but is built for only $90 per square foot. Such low up-front costs are made possible in part due to the use of very base level materials, but mostly due to the fact that Segal was able to serve as the general contractor and perform many of the sub trades himself, cutting out the middle-man along with his marked-up prices. In the end the project costs amounted to $2,336,579, less than half the $6,000,000 the property is currently valued at.

The surplus economic value generated from the Union is largely indebted to the appeal of the project as an ecological and social asset. With regards to ecology-economy considerations, the Union is 100% solar powered, completely day lit, and passively cooled with cross ventilation, meaning tenants pay virtually nothing for utilities. This allows them to pay more for rent without increasing their cost burdens, generating additional income for the architect-developer. In terms of equity-economy, the Union includes two affordable

live-work lofts, which not only facilitate income mixing, but conforms with density bonus requirements that allow for additional units on site (beyond what is permitted by zoning), increasing the project's cash flow. The Union is presented by Jonathan Segal as a prototype for economically, ecologically, and socially integrated development, and as such embodies the essence of triple top line design thinking (Architect as Developer).

Conversely, if a project is located in a historically significant area and the architect-developer is motivated by the opportunity to help revitalize the neighborhood, he will look for ways to maximize the social impact of the development. This will be achieved most effectively by basing design decisions in the social equity sector of the Sierpinski fractal, but enhanced by considering ecological and economic considerations that will provide additional benefits to the overall social value of the project. For instance, ecologically, a project located in close proximity to basic services and public transportation, will not only assist in taking cars off the road, but make the development more accessible to people lacking automobile access. Economically, a project that is financially successful will attract more new developments to the area, facilitating neighborhood revitalization.

Burnside Rocket: Socially Driven Triple Top Line Development

The Burnside Rocket located at the corner of East Burnside Street & 11th Avenue in Portland, Oregon, is a four story 16,500 s.f. mixed-use commercial building developed by architect-developer Kevin Cavenaugh. The site is small and very tight for a building the size of the Rocket, but close proximity to existing neighborhoods and transit infrastructure made it attractive to Cavenaugh, whose overall goal was to combat urban sprawl and fostering community. This social agenda is a primary design driver, but economic and ecological considerations also enhance the social value of the Burnside Rocket (while increasing economic and ecological value as well)

The Burnside Rocket is a high density project with no parking on site, instead sharing space with nearby lots to accommodate the needs of drivers visiting the project. This gives priority to those accessing the site by one of the ten different bus, rail, and bicycle routes that run by the site and makes the development much more pedestrian oriented. The building is further connected to the neighborhood with outdoor terraces that allow people visiting the café, offices, and restaurant to be seen from the street. The social focal point, however, are the twenty-four panel paintings by local artists that clad the exterior and serve as window shades. These works of art greet the fifty plus employees and hundreds of visitors that frequent the building each and every week.

The Rocket is primarily viewed as a social asset, but its ecological and economic value has almost as much to do with that distinction as its social value. In terms of ecology-equity considerations, the majority of the building's green roof also doubles as a garden, which supplies fresh produce to the top floor restaurant, and brings a whole new meaning to the idea of "eating local." The building also is quite energy efficient, using 50% less energy than what is typical. This allows the developer to forego the conventional (triple-net) lease arrangement with tenants where they are responsible for paying their own utilities. By paying lower utility bills in house, the developer is able to charge higher base rents, increasing profit without the tenants having to pay anymore than they would under conventional leases, where they must pay their own expenses. This consideration speaks to the economy-equity sector of the Sierpinski Triangle, which combines with contributions of the ecology-equity sector to maximize the social value of the Burnside Rocket. While socially driven, Kevin Cavenaugh's Burnside Rocket is also an ecological and economic asset that benefits both shareholders and stakeholders, establishing its position as a triple top line development (Burnside Rocket). For a more in-depth analysis of the Burnside Rocket building, please refer to Chapter 6 of this document.

Figure 19 - The Burnside Rocket, Portland

While the extent to which a triple top line project is developed as an economic, ecological, and social asset is largely dependent on its context and the motives of the architect-developer, minimum

base line requirements for each sector must be met for any development to be viable. With regards to economy, all projects must be able to obtain financing. In terms of ecology, they must be in compliance with requirements for clean air, clean water, energy efficiency, and stormwater management. Socially, all projects must meet code, get approval from local zoning and planning boards, and gain acceptance by community stakeholders. As such, the maximization of a single (Sierpinski triangle) sector should not arise from the devaluation of other sectors, nor should it be seen as the ultimate goal. Such an extreme 'ism' stance (capitalism, ecologism, socialism) often neglects factors crucial to long-term success, and puts economy, ecology and social equity at cross-purposes, when they should be, in fact, interrelated. However, this is not meant to imply that triple top line development is merely an economic, ecological and social balancing act.

Triple top line developments, rather than balancing the different value systems, take advantage of opportunities in honoring the needs of all three, building on interconnected relationships as opposed to managing alleged conflicts. The Sierpinski fractal as a design tool facilitates such development by introducing a new standard of quality to projects, adding ecological intelligence, social justice, and the celebration of creativity to the typical design criteria of cost, performance, and aesthetics. This design foundation takes projects beyond sustainability, a minimum condition for survival, by inspiring inhabitants with sunlit spaces, fresh air, copious views of the outdoors, and cultural delights (that are generators of economic value as well). Triple top line development is not about sustainability, it is about sustaining prosperity with environments economically, equitably, ecologically and elegantly enjoyed by all (McDonough, "Design").

Chapter 6: 100 West Elder Design Project

Figure 19 - 100 West Elder Imagery

Developer driven projects in the United States most often come about as the result of two basic conditions. In the first instance, a developer identifies a need in the marketplace, conceives of a project that will serve that need, and proceeds to find a site that will facilitate a desired outcome. In the second scenario, the developer is presented with (or given) a site by an outside party, proceeds to identify the highest and best use for the property, and develops the project accordingly. The 100 West Elder project located on a corner lot along Cincinnati's Historic Findlay Market is a product of the later scenario. The aim of this chapter is to chronicle the property's development process from analysis through design development and evaluate its financial feasibility through a *pro forma* projection.

Site Selection

The selection of the 100 West Elder site is the result of an effort to make project constraints as real as possible through collaboration with a local developer, on a property currently under contract. The 100 West Elder site was one of several properties under consideration for this design project and was ultimately chosen for its size, high profile location, and unique architectural opportunities. The majority of the site is occupied by a four-story 19th Century building, however, due to the collapse of its east wing during renovation efforts in 2003, the opportunity for a new addition now exists.

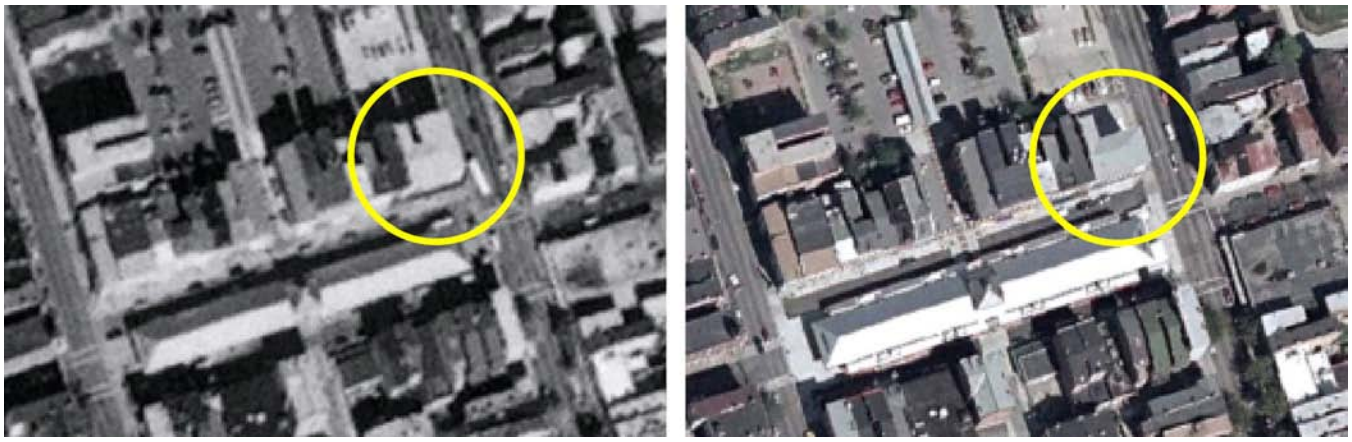


Figure 21 - 100 West Elder Before and After Building Wing Collapse

Site Overview

Cincinnati's Findlay Market is a compilation of Ohio's oldest surviving municipal market house and its more than twenty adjoining storefronts. It was added to the National Register of Historic Places in 1972 and considered the city's most successful urban gathering space for its unique ability to attract socially, economically, racially, and ethnically diverse crowds in an otherwise segregated municipality. Findlay Market is located in the heart of the Over-the-Rhine neighborhood, whose collection of commercial, residential, religious and civic architecture is considered one of America's largest and most cohesive

surviving examples of an urban, nineteenth century community (findlaymarket.org). Over-the-Rhine is recognized as the city's most blighted neighborhood, but public and private investment and development initiatives in recent years have led to a communal renaissance of sorts to which the 100 West Elder project has the opportunity to contribute.

Design Process

The architect-developer 'build-up' design process involves the constant alignment and realignment of design decisions with economic considerations throughout the concept, pre-development, and development phases leading to construction. As such, the design activities of site analysis, space programming, and schematic design will be complimented by the development activities of a market analysis, financial programming, and *pro forma* projections as the 100 West Elder project progresses.

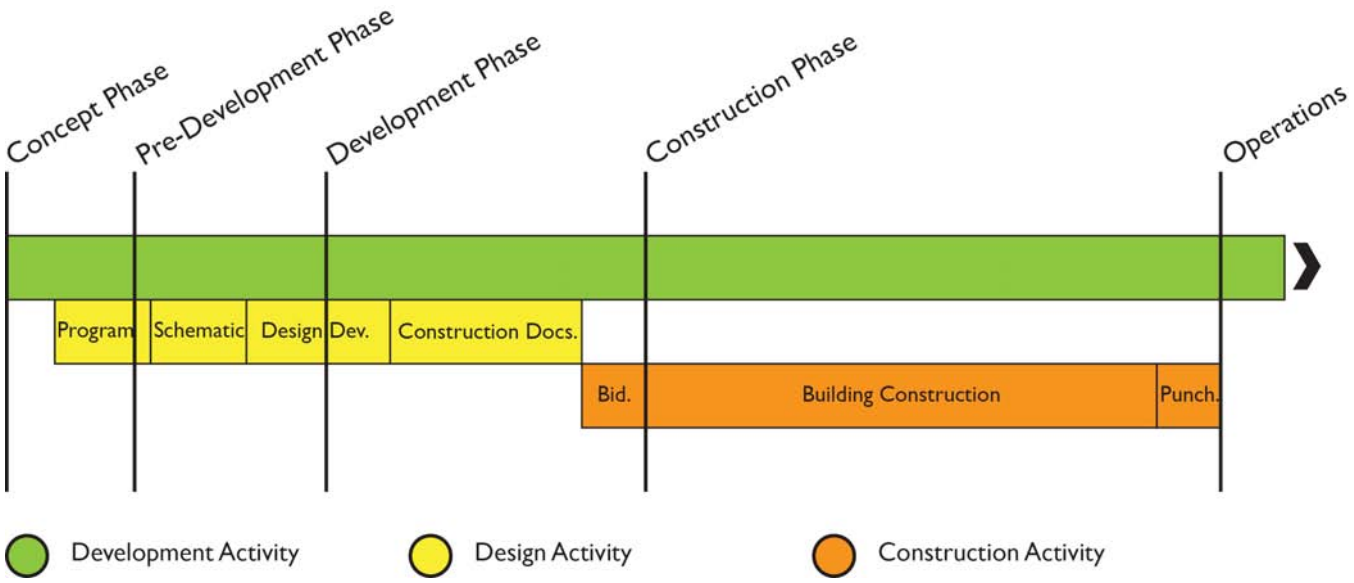


Figure 22 - Development Process Diagram

Analysis

Site Analysis

In dealing with a pre-determined site and existing building, the primary goal of the site analysis phase for the 100 West Elder project is to identify strengths, weaknesses, opportunities, and threats across different scales that might effect design and financial considerations down the line. The scope of the analysis encompasses physical, climate, and contextual conditions and is conducted in conjunction with the Market Analysis.

- Physical Conditions
  - Context: Findlay Market is located in the Over-the-Rhine Neighborhood, which is situated between the city's three largest employment areas; the Commercial Business District to the south, the University of Cincinnati to the north, and the Cincinnati Medical Center to the northeast. The close proximity and easy access to these employment and educational centers makes the location especially attractive to professionals and college students looking to avoid long commute times to and from work and school.

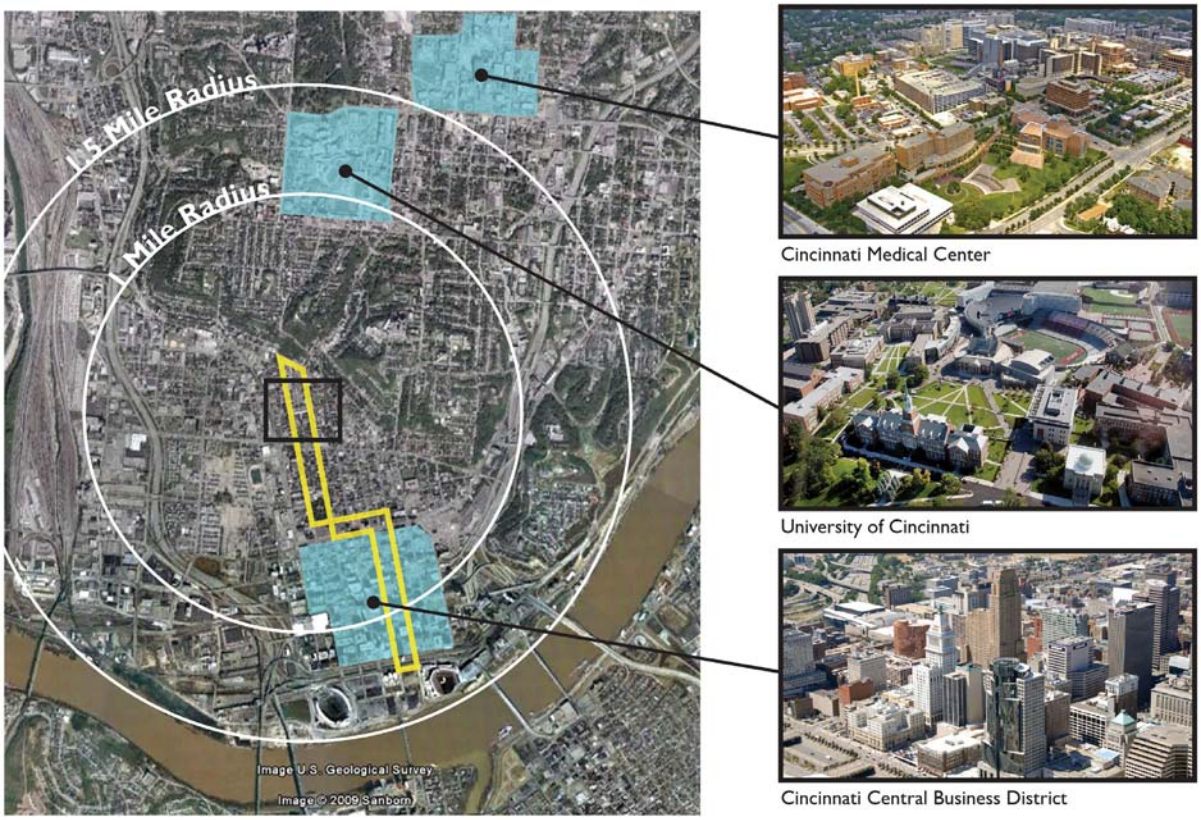


Figure 23 - Cincinnati Employment Centers Diagram

  - Connections and Access: Two major interstates (in green); I-75 to the west, and I-71 to the east connect Over-the-Rhine to the surrounding suburbs and other regional points of interests. A proposed streetcar route (in yellow) will provide additional access (along with bus lines) to the central business district (CBD), riverfront, and uptown neighborhoods. The variety of transit options available to access both local and regional destinations facilitates the use of both the car and public transit as a means of travel to and from the Findlay Market site.

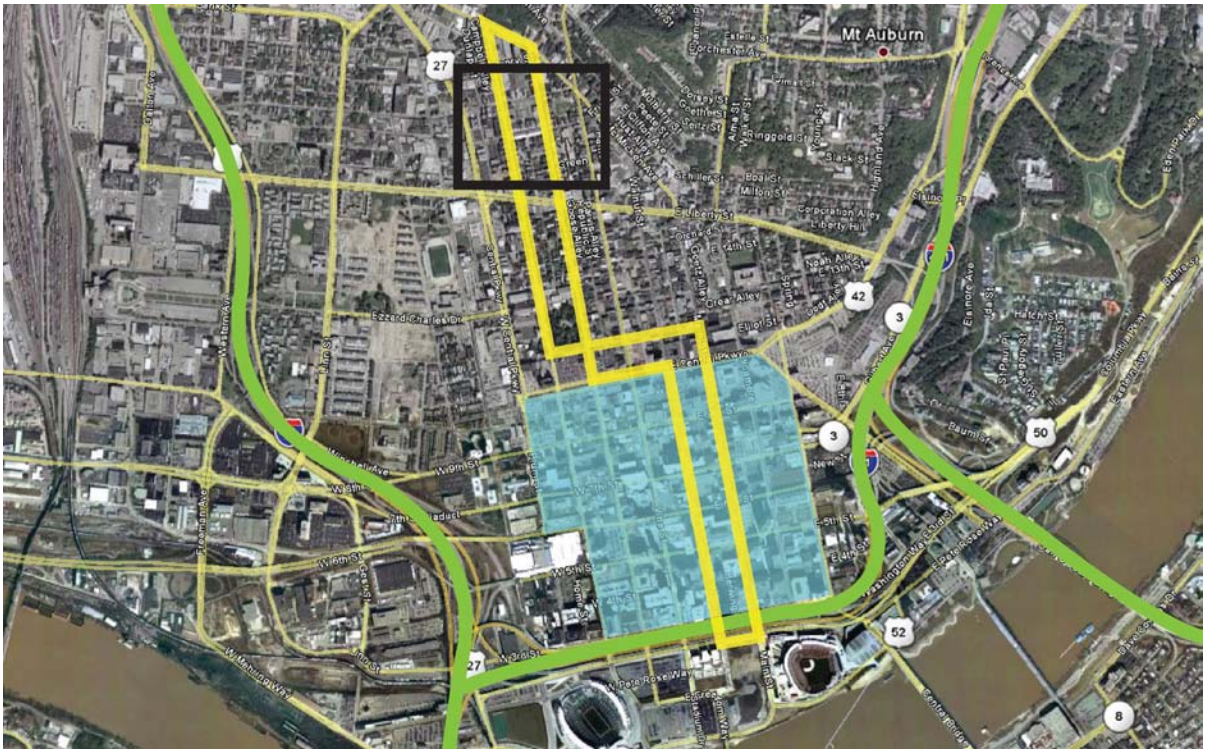


Figure 24 - Connections and Access Diagram

- Topography: The topography in the Findlay Market area of Over-the-Rhine is relatively flat, minimizing the amount of site work needed for construction purposes. However, the level grade is contrasted with steep inclines along the neighborhood's north and northeastern boundaries, which provide the 100 West Elder project with scenic hillside views of uptown.

Figure 25 - Over-the-Rhine Topography

- Climate Conditions
  - Temperature: Cincinnati, OH experiences all four seasons with average temperatures in the summer rising above the comfort zone and average temperatures in the fall, winter, and early spring falling below the comfort zone. Increasing insulation and properly shading the building will help to mitigate the effects of the temperature swings throughout the year.

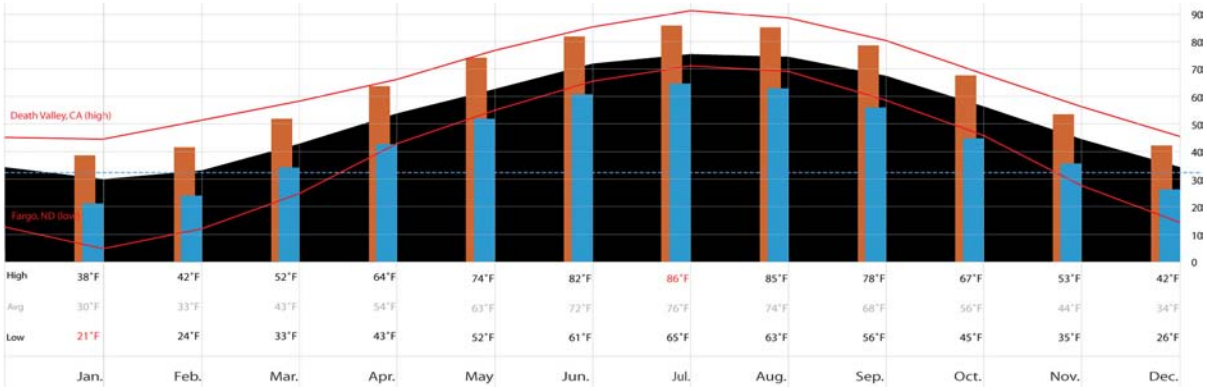


Figure 26 - Cincinnati Temperature Data

  - Relative Humidity: Relative humidity levels during the morning and overnight hours throughout the summer and fall months tend to rise above the human comfort zone. While somewhat desirable in cooler months, the hot and sticky Cincinnati summers can be uncomfortable and need to be addressed in the building design.

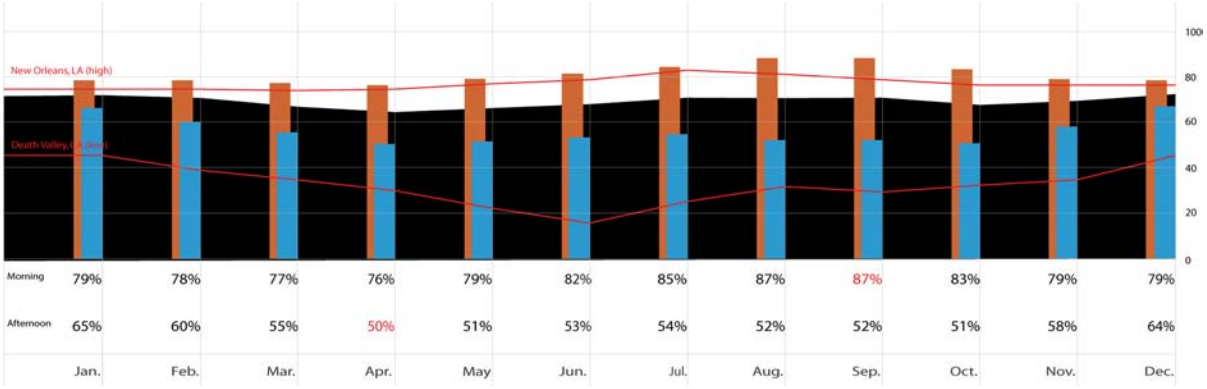


Figure 27 - Cincinnati Relative Humidity Data

  - Comfort Zone: The dramatic temperature and humidity swings suggest that thermal comfort will be effectively obtained through conventional heating (55% of the time), humidification (17% of the time), and internal heat gain (15% of the time). Sun shading, passive solar gain, and wind protection are some other interventions that should also be considered.

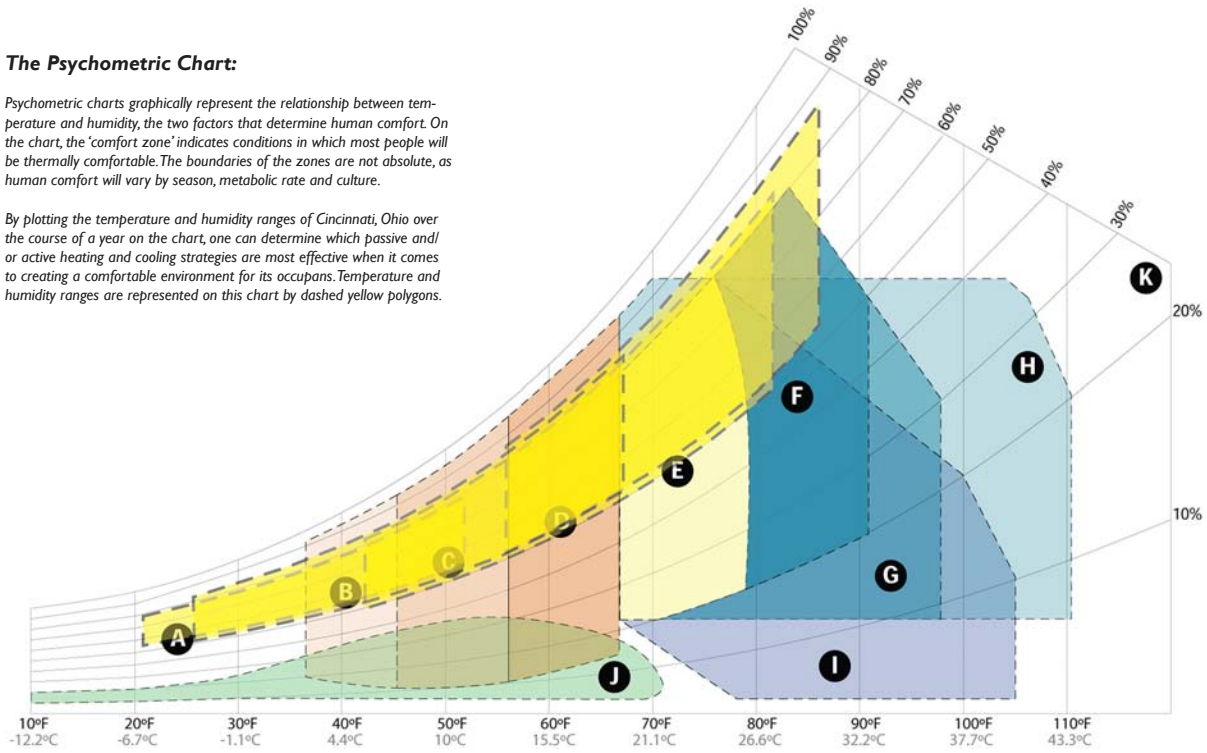


Figure 28 - Cincinnati Psychometric Chart

- Solar Shading: The sun path and shading study conducted utilizing the Ecotect software shows that the 100 West Elder building has a large southern exposure with many windows and little shading. This is desirable in the cooler months but problematic during the hot summers Cincinnati experiences. Due to historic conservation limitations, the addition of exterior sun shades is not a viable solution, but fortunately, fire escapes lining the southern facade may help to serve a similar function. Further modeling and analysis will be needed to determine whether or not this is the case.

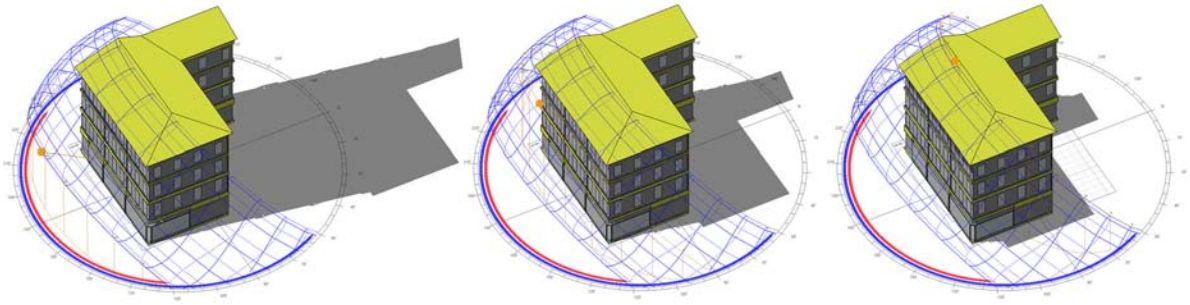


Figure 29 - Solar Shading Study

- Context

Figure 30 - Findlay Market Figure Ground Diagram

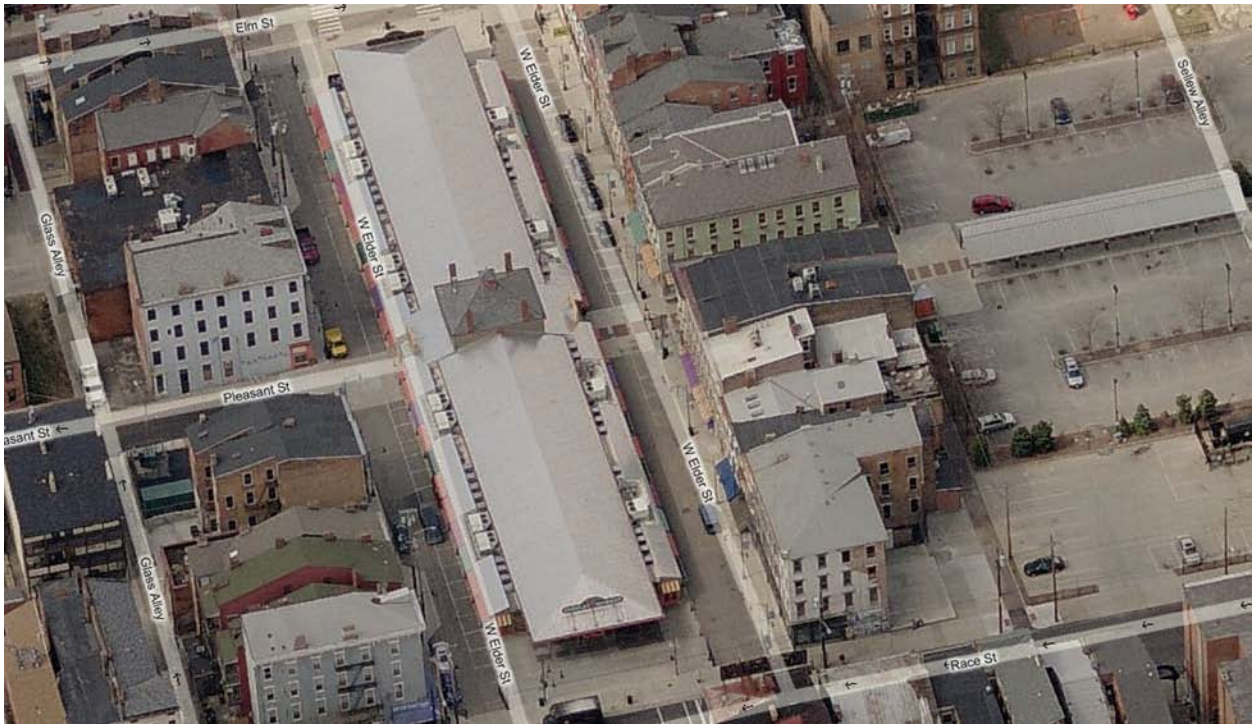


Figure 31 - Findlay Market Bird's-eye View

- History: Findlay Market is Ohio's oldest surviving municipal market house and was listed on the National Register of Historic Places in 1972. The structure was among the first markets in the USA to use iron frame construction technology and is one of a select few that have survived. In 1902, public health concerns about the market, which was open to the elements and increasing urban pollution, prompted the enclosure of the market house and the addition of plumbing and refrigeration. The Market was renovated in 1973 and expanded in 2002.

Figure 32 - Historic Findlay Market Imagery

- Movement Systems: The 100 West Elder building is located along several bus lines as well as the proposed street car line with a stop only feet from the building's primary entrance. The site is also accessible by car with large amounts of parking located immediately to the north of the structure. Findlay Market is very pedestrian friendly with wide walkways surrounding the central structure and sidewalks connecting the site to other points of interests including Music Hall and Washington Park a few blocks south of the market.

Figure 33 - On-Site Movement Diagram

- Architecture: The architecture within and surrounding Findlay Market reflects the style of the late 19th century with colorful facades, ornate cornices, and glass storefronts that open out onto the street. The historic buildings are a selling point that have attracted a renewed interest to Over-the-Rhine in recent years.

Figure 34 - Findlay Market Architecture

Market Analysis

While architect-developers are the ultimate design authority, projects still must be tailored to meet the needs and wants of a target market and conform with a bank's lending requirements. The primary objective of the market analysis for a pre-determined site like 100 West Elder is to identify the appropriate target market for the project, which will inform many of the programming and design decisions down the line. The market analysis establishes the local demographics, takes note of development trends, and identifies comparable projects in order to situate the project within the larger development context.

- Demographics
  - Population: Census data for Over-the-Rhine shows a steady decline in population during the past 100+ years, especially following World War II, with the number of residents falling from 44,475 in 1900 all the way down to 6,882 in 2007 (cincinnati-oh.gov). However, it is worth noting that recent revitalization efforts in Over-the-Rhine fueled by a combination of public and private investment have significantly upgraded and increased the neighborhood's housing stock for the first time in decades, facilitating a likely increase in population for the 2010 census, and making the 100 West Elder project much more viable than it would have been five or ten years ago.

- Income: The median household income for Over-the-Rhine residents in 2008 was $13,346, which is more than $20,000 less than Cincinnati's median household income. As such, the median rent for Over-the-Rhine was $310, compared to $484 for Cincinnati. This suggests that rents for the 100 West Elder project would be similar, but for Over-the-Rhine's more desirable locations near Findlay Market and in the heart of the Gateway Quarter, rents often command three times this amount and attract a much different demographic (in terms of income) than what is typical for the neighborhood (city-data.com).
- Mobility: The travel time and mode of transportation utilized by the Over-the-Rhine residents in commuting to and from work is quite distinct from the rest of Cincinnati and an opportunity to attract new demographics to the neighborhood. The average travel time to work is noticeably shorter for workers living in Over-the-Rhine than for other workers within the city limits and roughly half of what it is for workers living in the suburbs. Over-the-Rhine residents also tend to be much less car-dependent than most Cincinnatians and many elect to walk to work, which is almost unheard of in suburban neighborhoods. Granted, low-income levels might prevent some residents in Over-the-Rhine from owning cars, but at the same time, the close proximity to public transit and employment centers provide individuals with viable, if not preferable, transit alternatives that simply do not exist in other communities.

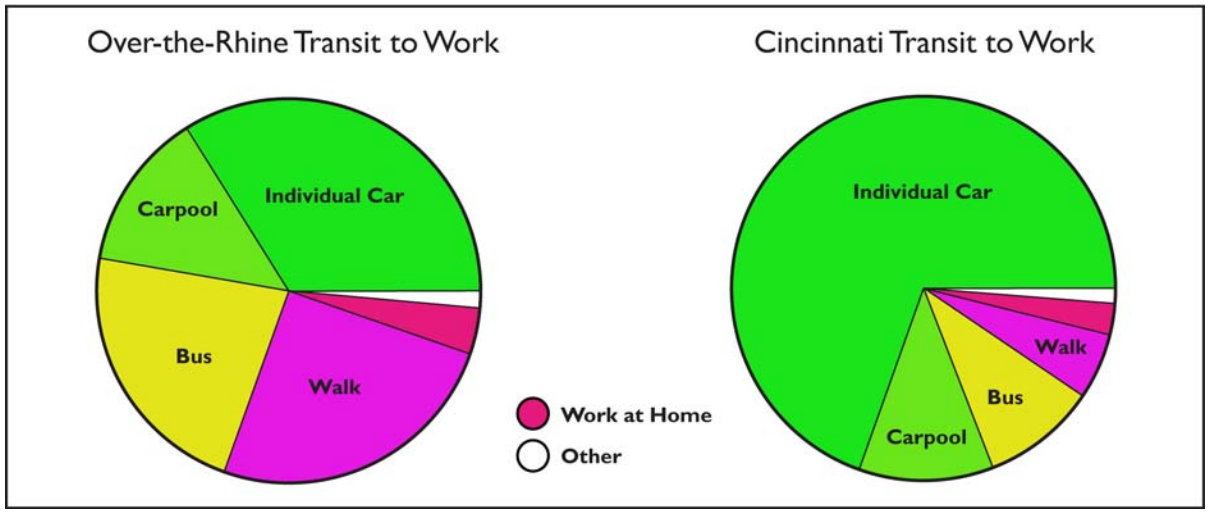


Figure 35 - Mode of Transit to Work Diagram

- Development Trends: While informative on many levels, the demographics of Over-the-Rhine (as noted above) are not a reliable indicator as to what the target market will be for the 100 West Elder project specifically. A more appropriate means for determining the target market is through the analysis of recently completed, current, and upcoming projects.

Figure 36 - New Over-the-Rhine Developments Diagram

- Gateway Quarter Redevelopment: Since 2006, about $93 million has been invested in the development and creation of the Over-the-Rhine Gateway Quarter, which will be punctuated by the new Cincinnati School for the Creative and Performing Arts in the fall of 2010 and Washington Park renovation shortly thereafter. The Gateway Quarter initiative has helped to retain long time businesses and to lure new faces to Over-the-Rhine as well. Old and young patrons alike, attracted by the large collection of Italianate, Muted Greek Revival, and Queen Anne architecture, as well as the sense of community embodied in the "stoop sitting" culture of Over-the-Rhine, have relocated to the neighborhood in droves seeking an alternative to the suburban lifestyle many have grown accustomed to. (otrgateway.com).

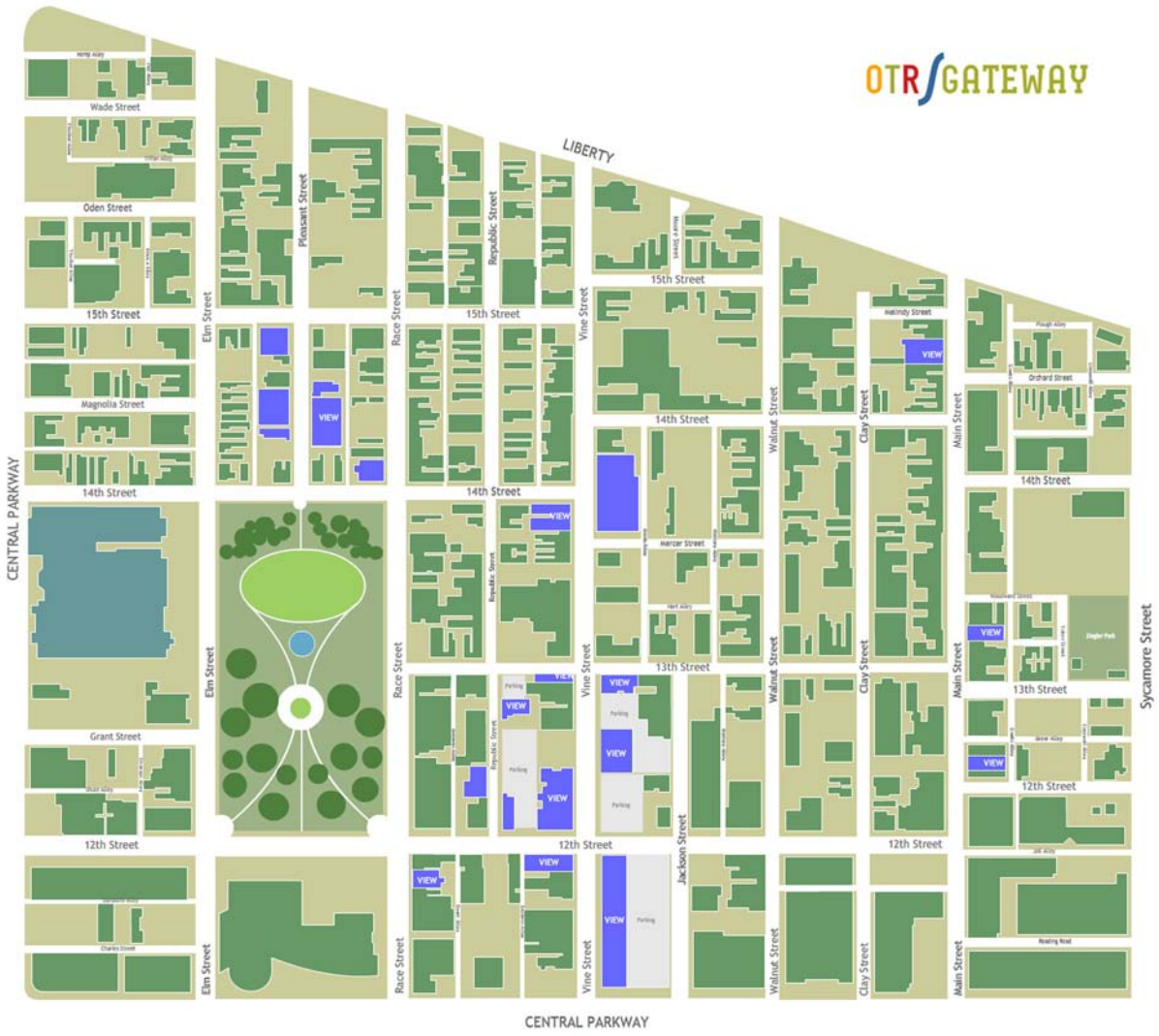


Figure 37 - Gateway Quarter Development Map

- Brewery District Redevelopment: The Brewery District in Over-the-Rhine is generally defined as the area north of Liberty Street and west of McMicken. Despite being home to local icons like Findlay Market and Rookwood Pottery, the Brewery District has been overlooked in recent years as 3CDC and other developers have focused primarily on the Gateway Quarter in the southwestern portion of Over-the-Rhine. However, local revitalization efforts have since expanded to include the Brewery District's thanks to backing by the Brewery District Community Urban Redevelopment Corporation, developers, and designers who have recognized opportunities to create sustainable mixed-use projects in and around the Findlay Market sub-district (The Over-the-Rhine Brewery District Design Charette 2009). The 100 West Elder project will be an important contributor to the larger Brewery District redevelopment effort.

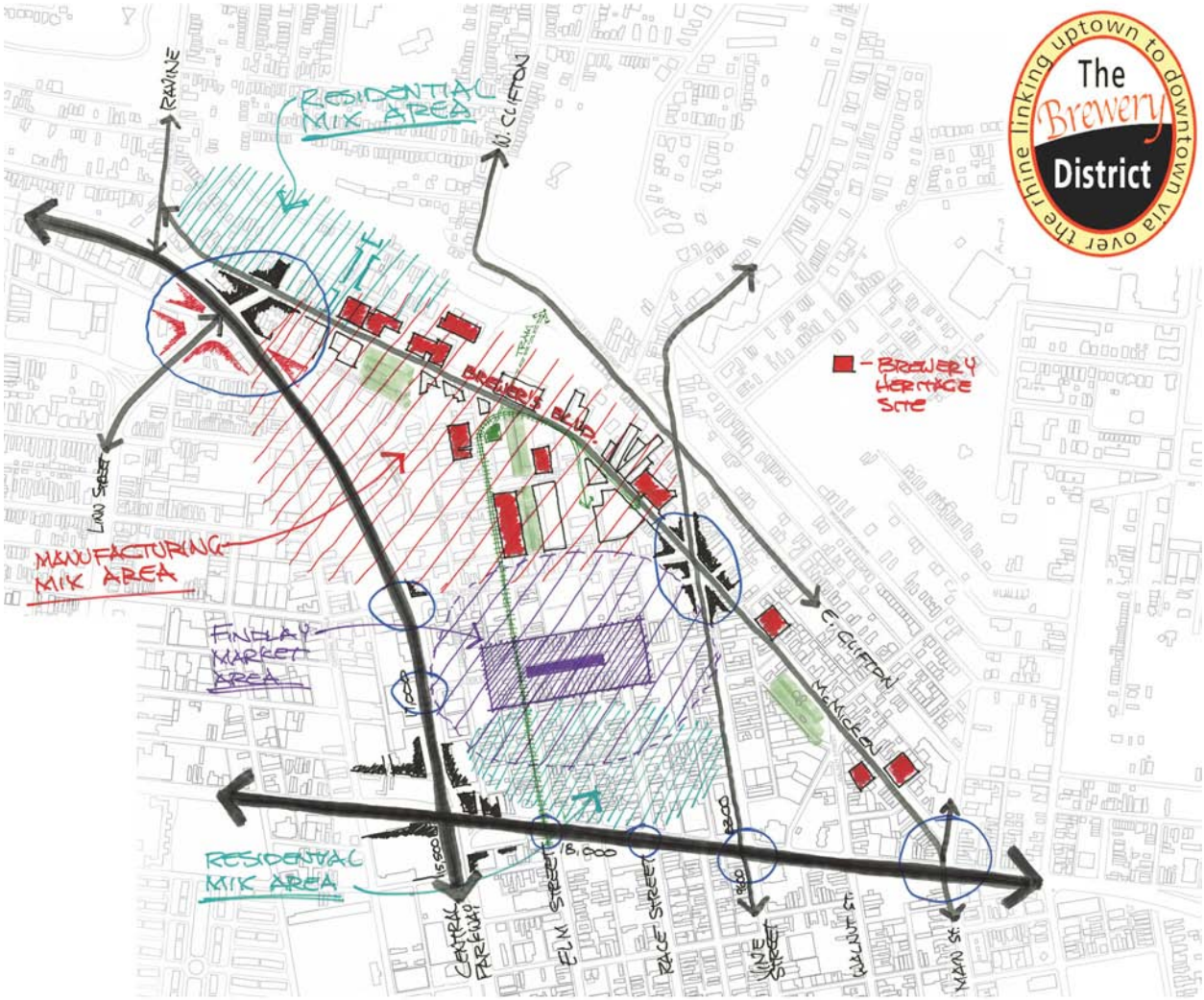


Figure 38 - Brewery District Development Proposal

- Comparables: Development trends suggest that the 100 West Elder site is positioned in the 'path of progress' and will appeal to a type of tenant, similar to that which has been attracted to the new market-rate projects in Over-the-Rhine thus far. That said, the properties along the Market House are unique unto themselves and the most accurate method for establishing the 100 West Elder target market is through comparisons with other Findlay Market properties.
    - Residential Units: Despite the vibrant facades of the buildings lining the Findlay Market House, more than half of the residential units above the storefronts are vacant and not available for rent. Nevertheless, the select units that have been renovated and are suitable for rent have an occupancy rate approaching 100% and command rents nearly three times as high as the neighborhood average, implying there is a sufficient demand for the 100 West Elder project.

- 108 West Elder: Two buildings to the west of the 100 West Elder property is 108 West Elder, whose 2 bedroom, 2 bathroom apartment most recentlybecame available for rent during the fall of 2009. The 1200 square foot apartment is recently renovated and was available for $900 a month plus utilities at the time. The size and program is approximately the same as what the 100 West Elder units will facilitate and therefore it can be assumed that the rental income will be comparable (craigslist.org).

Figure 39 - 108 West Elder Images

- 110 West Elder: Three buildings to the west of the 100 West Elder property is 110 West Elder, whose 1 bedroom apartment also became available for rent during the fall of 2009. The newly renovated 1,100 square foot apartment was available for $795 a month plus utilities. After making adjustments for the smaller unit size and program, the rent for this property is in line with the $900 per month 2 bedroom 2 bathroom unit next store and as such, comparable to what 100 West Elder will command in rents (craigslist.org).

Figure 40 - 110 West Elder Images

- Commercial Spaces: Much like the apartments along the Market House, comparable rents for the commercial spaces below is most effectively determined through direct comparisons with other Findlay Market properties. According to Robert Pickford, President and CEO of The Corporation for Findlay Market, commercial rents for the storefronts surrounding the Market House are approximately $12 per square foot, but will vary based on lease structure.

Figure 41 - Commercial Storefront Images

- Target Market: Based on the factors of location, price point, accessibility, and demographic information for comparable projects in Over-the-Rhine, the target Market for the 100 West Elder project is most accurately identified by the term LOHAS Consumer. LOHAS is an acronym for Lifestyles of Health and Sustainability and is a market segment focused on health and fitness, the environment, personal development, and social justice. The LOHAS market segment in 2006 was estimated at $300 billion, or approximately 30% of the U.S. consumer market, and a study by the Natural Marketing Institute showed that in 2007, 40 million Americans were included within the LOHAS demographic (lohas.com). Findlay Market's proximity to job and entertainment centers, local flavor, cultural diversity, and affordable rents for students and young professionals makes it a desirable location for LOHAS renters and business looking to set up shop. That said, the building itself must also facilitate the wants and desires of the LOHAS consumer both programmatically and aesthetically if it is to effectively capture this target market.

Program

Space Program

The 100 West Elder space program is largely driven by the constraints of the building's existing structural and enclosure systems, however, the lack of interior infrastructure (including vertical

circulation, HVAC, and plumbing), gives the architect-developer a level of freedom to produce a layout that best meet the programmatic demands of its target market.

- Activities and Functions Classification
  - Square Footages
    - Residential: The second, third, and fourth floors of the 100 West Elder project are divided into six, 2 bedroom, 2 bathroom units, each with a square footage of approximately 1100. The unit sizes are derived from of the structural bays formed by the building's brick bearing walls and compare favorably other apartments along the Market House.
    - Commercial: Similarly to other Findlay Market properties, the first floor of the 100 West Elder development is primarily devoted to commercial space. However, the 100 West Elder project is somewhat unique in that it is able to house two commercial tenants, with one utilizing the existing structure and the other residing in what is a new addition. The commercial space in the existing building is approximately 2000 square feet while the area of the addition is limited to roughly 900 square feet.

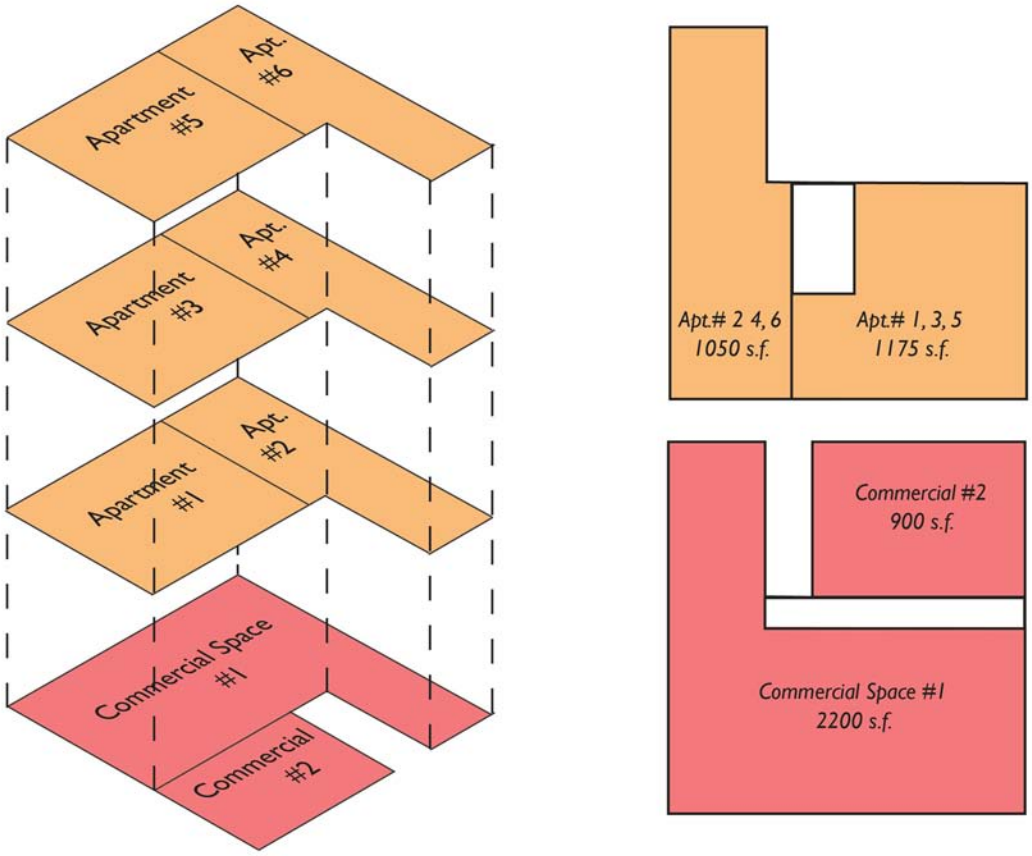


Figure 42 - 100 West Elder Square Footages Diagram

- Common Areas: The non-leasable common areas for the 100 West Elder project include apartment circulation, mechanical space, and back of house functions.

◦ Arrival Sequences: In contrast to other retail centers in the region, Findlay Market is accessed by modes of transportation that extend beyond the automobile alone. A significant number of patrons and residents arrive to the site by walking, biking, or riding the bus (or potentially streetcar in the future) and as such, it is important that the space program responds to each condition without favoring one over the other. As a result, the 100 West Elder building allows for a variety of entry sequences, treating each one with respect and an attention to detail that will show through in the final design.

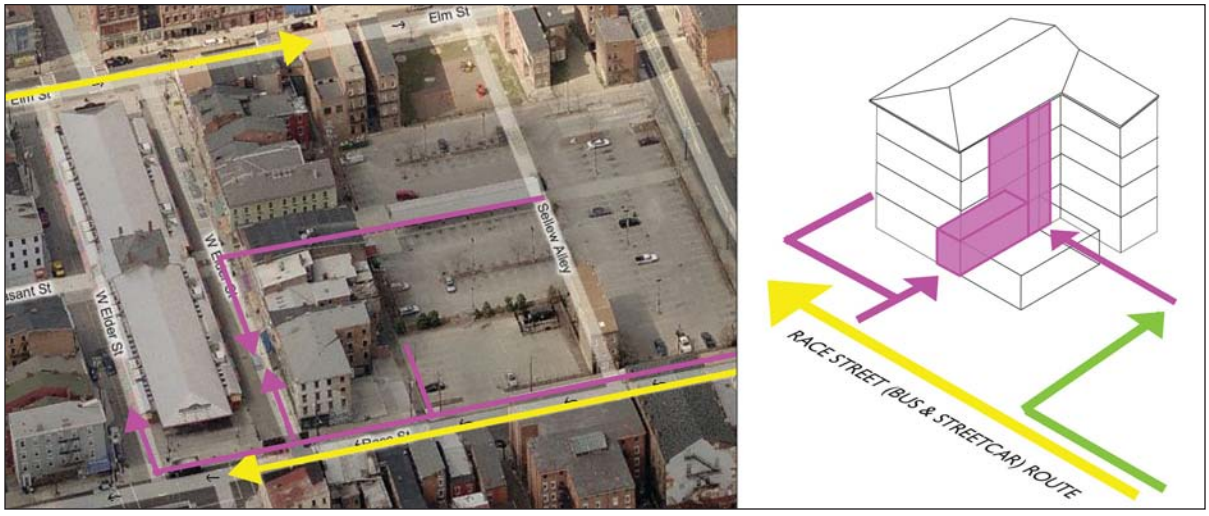


Figure 43 - 100 West Elder Arrival Sequence

◦ Activities: One approach utilized to further the development of the space program for the 100 West Elder project was exploring a series of 'day in the life' scenarios for the different building users to make certain that the program accommodate all the various common activities.

- The Patron: The duration of the patron's (or shopper's) experience within the building is the shortest of the different occupant groups and a 'day in the life' will include arriving, exploring, and (ideally) buying. It is critical then for the commercial space to have an atmosphere that is comfortable and encourages browsing and exploration, since the longer a person is in a store, the more likely he or she is to buy. The space must also be distinct from the other storefronts to make a lasting impression with patrons and keep them coming back in the future.

- The Employee: The duration of the employee's experience within the building is considerably

longer than the patrons and a 'day in the life' will typically include arriving, collaborating, and producing. As such, the commercial space must be flexible to accommodate group work and meetings, and create an atmosphere that is conducive to worker productivity. Fresh air, daylight, and a visual connection to the outdoors are a few tangibles that have been proven to increase worker productivity ("Restoring the Industrial Landscape").

- The Resident: The resident is perhaps the most invested of the building user groups and while the 'day in the life' will vary among individual occupants, it will often include arriving, preparing, socializing, and relaxing. Comfort is of the utmost importance for the resident and the units and common spaces should accommodate this need through appropriate public-private hierarchies, material selections, lighting levels, and overall aesthetics.

- Space Standards and Criteria: The space program standards developed for the 100 West Elder project are a product of precedent research (from new Over-the-Rhine developments), trial runs of furniture fit-outs for residential and commercial spaces, and Time Saver Standards. Collectively, the research suggests that the most effective means of program development is to designate all areas as either service or served zones and find ways to maximize the efficiency of the service areas and the flexibility of the served. This means streamlining kitchens, bathrooms, and circulation to allow for open and spacious bedrooms, living rooms, and dining areas in the residential units, and streamlining kitchens, mechanical rooms, and back of house areas to allow for open and spacious retail and office floors in the commercial spaces.

Figure 44 - Service-Served Diagram

- Relationships and Organizations: The primary organization of the 100 West Elder program is based on a combination of orientation and public-private considerations.
    - Residential: In terms of residential units, all of the bedrooms are situated along either southern or eastern exposures to allow for the sun to penetrate the spaces in the morning and wash the rooms with warm, comforting light. Meanwhile, the living areas (for apartments #1, #3 and #5) are oriented in the opposite direction to not only provide the many artists living in the area with consistant northern lighting, but stunning views of the rolling hills of Uptown as well. Additional means of organization include groupings based on similar uses (i.e. the proximity of kitchen, dining, and living).

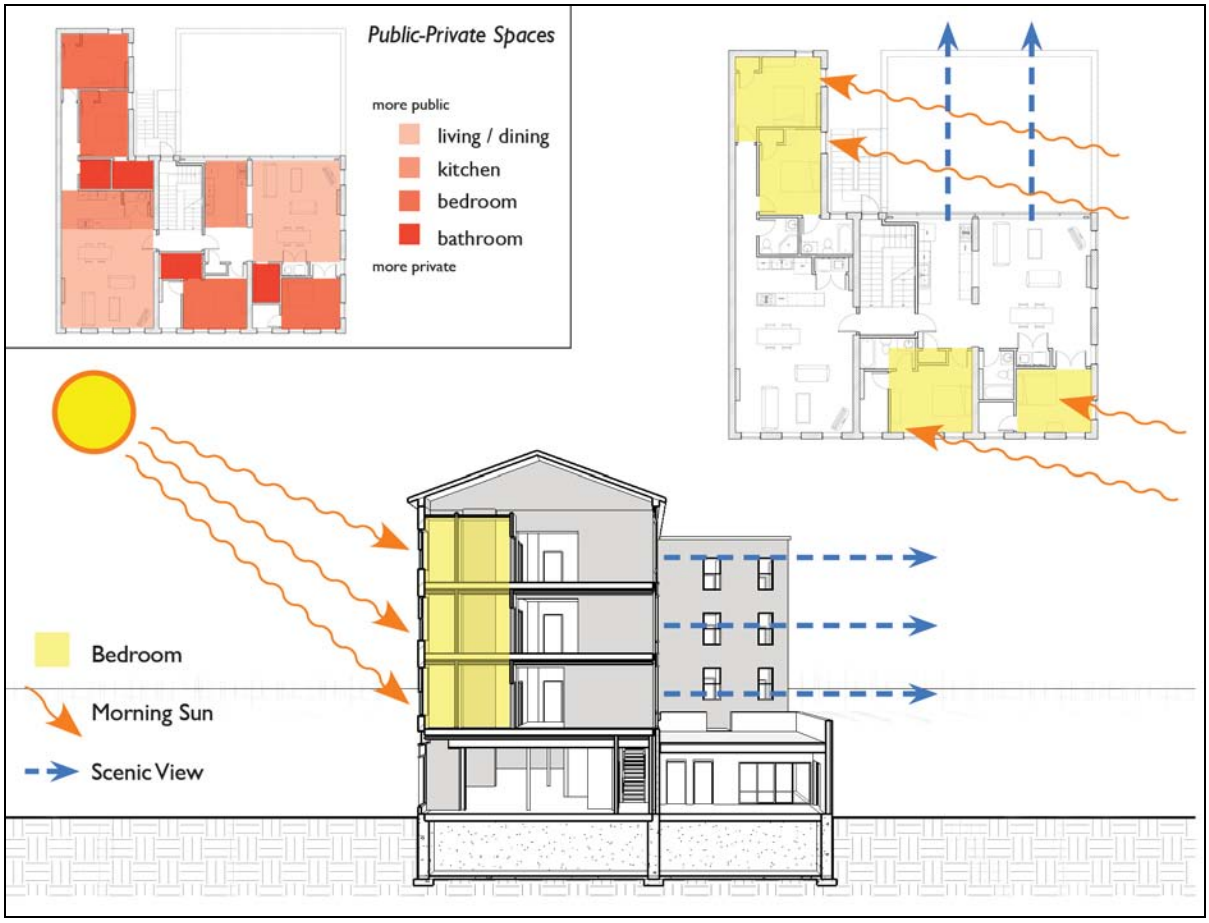


Figure 45 - Residential Organization Diagrams

    - Commercial: With regards to the building's two commercial spaces, the spatial organization is a product of the public street frontage to the south and east, where the most public retail displays and common areas are located. The more private spaces are relegated to the less accessible areas of the project to the north and west.

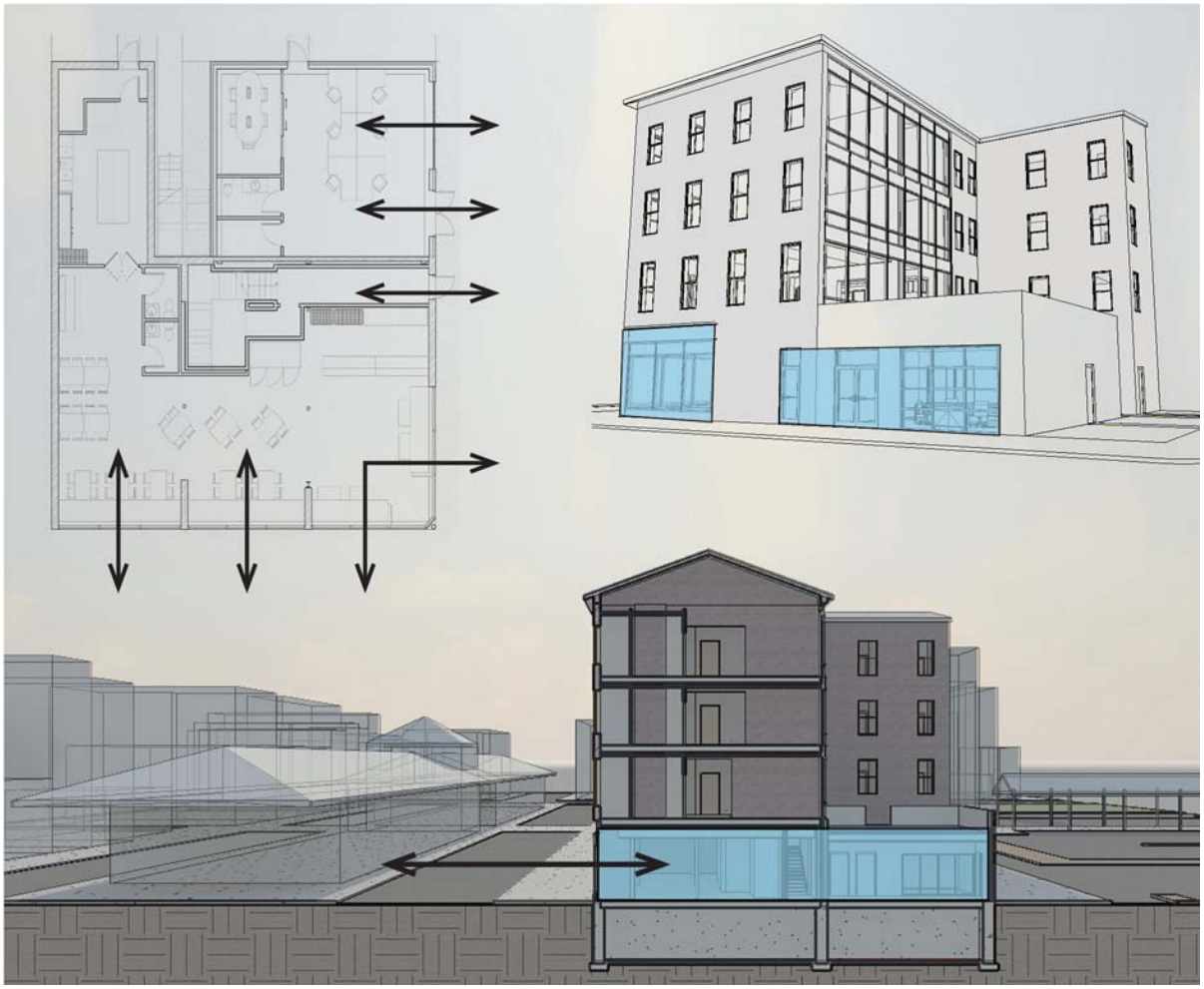


Figure 46 - Commercial Organization Diagram

Financial Program

The financial program for the 100 West Elder project is a product of the market analysis, which identifies the target market for the property and the space program, which establishes base parameters for the development. The target market, assuming the project meets expectations, sets the price per square foot while the space program determines the amount of square footage to be provided for rent. Therefore, the outcome of the financial program will be an income amount that can be utilized down the line in the *pro forma* where income, expenses, and costs will be combined to determine the projects economic bottom line and feasibility.

- Apartments vs. Condominiums: The plan for the residential units (at least initially) is for them to be 'for rent' apartments rather than 'for sale' condominiums. The economic argument for this is that today's depressed housing market is not conducive to condominium sales with the social

argument being that apartments are accessible to a larger demographic (including students and young professionals) than are condos. A final case for apartments is that there is an undersupply of new 'for rent' units in Over-the-Rhine, which will increase the demand for those at 100 West Elder.

- Residential Units: The six apartments occupying the upper three floors of the 100 West Elder building are 2 bedroom 2 bathroom units that fit within one of two models, an 1150 square foot layout renting for $1200 a month, and a 1057 square foot layout renting for $1050 a month.
- Commercial Spaces: The two commercial spaces occupying the first floor of the 100 West Elder project are distinct from one another in that one is 2002 square feet, located in the existing building with an annual rent per square foot of $15, and the other is 863 square feet, located in the new addition with an annual rent per square foot of $14.

Design

The primary design objective for 100 West Elder is the creation of a development that is at the same time, an economic, environmental, and social asset benefiting both shareholders and stakeholders alike. However, for this ambitious triple top line objective to be realized, the project must first be situated within a larger development context in order to help define development drivers, and later broken down into more manageable goals, strategies, and tactics for design.

- Socially Driven Development: The historically significant, culturally rich, and socially diverse context of Findlay Market points to the 100 West Elder project being a socially driven development, similar in substance and style to Kevin Cavenaugh's Burnside Rocket building in Portland, Oregon. The social underpinnings of the Burnside Rocket development are the result of both context and architect-developer goals, or simply put, Context + Goals = Development Driver.
- Burnside Rocket Precedent

Figure 47 - Burnside Rocket Images

- Context: The Burnside Rocket site is small and extremely tight for a building the size of the Rocket, but its high density, close proximity to Portland's Central Business District, and exceptional transit infrastructure makes it appealing to the architect-developer and stakeholders from a social standpoint.
- Goals: The architect-developer project goals, while ultimately a matter of personal preference, should work towards the primary objective (of triple top line development) and compliment the context to help unify the design driver. Kevin Cavenaugh's goals, strategies, and tactics for the Burnside Rocket are as follows.
  - Goal 1: Combat Urban Sprawl
    - Integrated Site Selection: The Burnside Rocket's site was selected for its proximity to Portland's Central Business District, easy access to multiple public transit lines, and plethora of basic services within walking distance.

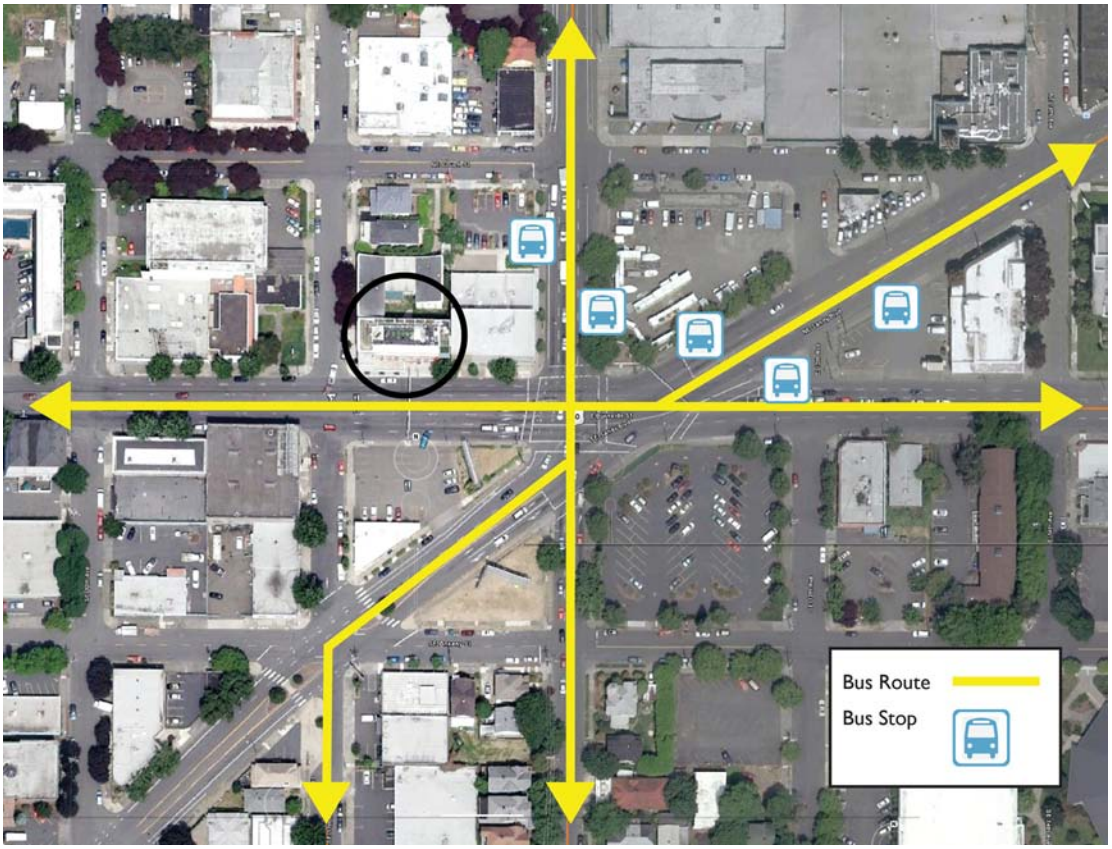


Figure 48 - Burnside Rocket Transit Access Diagram

  - Goal 2: Foster Community

- Active Street Presence: The Rocket's ground floor transparency, outdoor spaces engaging the street, and multiple entries connect the building to the surrounding neighborhood and the neighborhood back to the building..

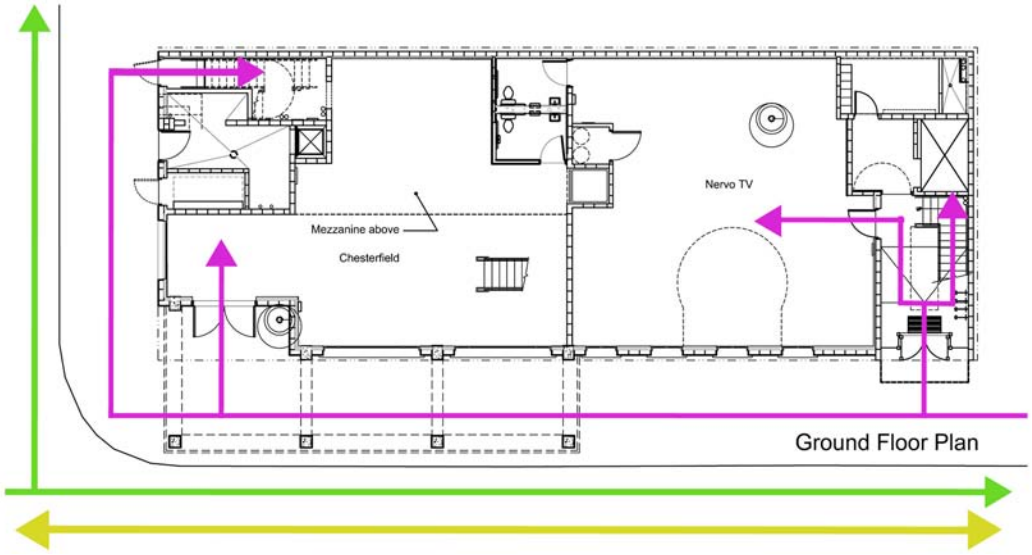


Figure 49 - Burnside Rocket Circulation

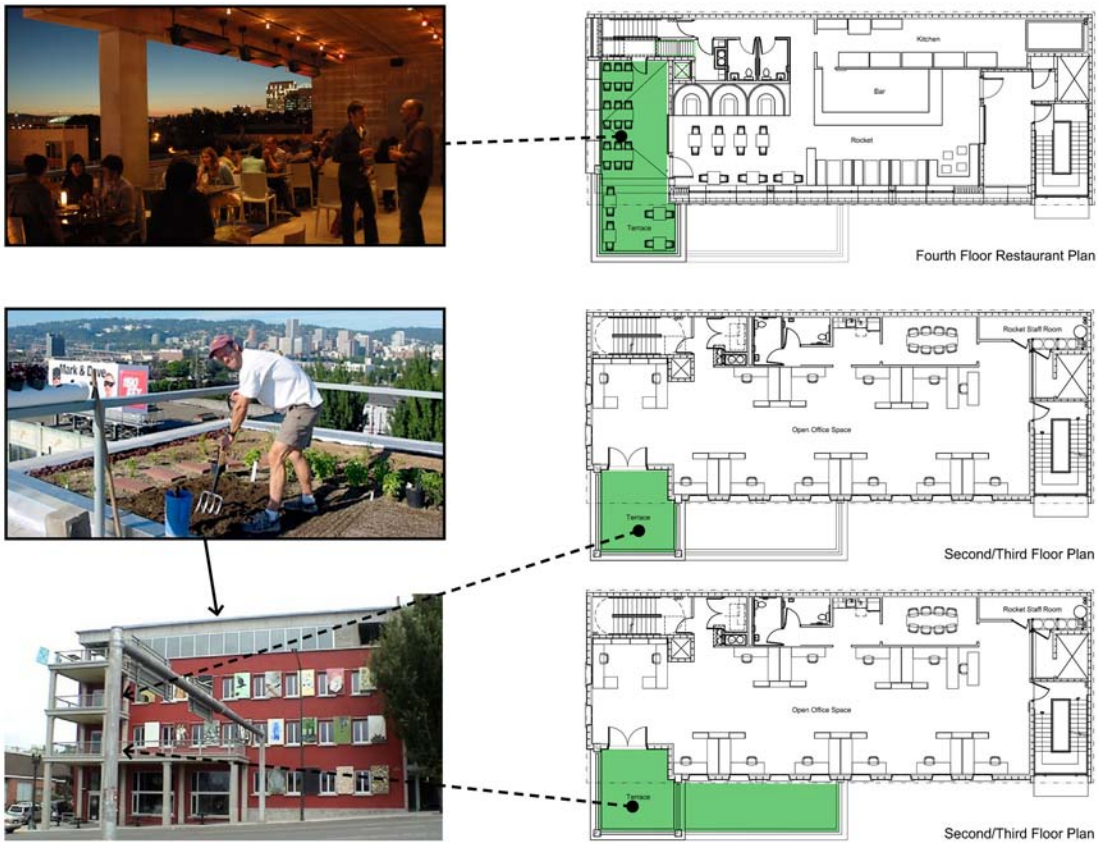


Figure 50 - Burnside Rocket Outdoor Space

- Building Art: The Burnside Rocket's sliding window shades double as canvases for 24 emerging artists that live, work, and show art in the local community to showcase their talents.

Figure 51 - Burnside Rocket Artwork

- Goal 3: Promote Sustainable Development
  - Edible Green Roof: 'Eating Local' is taken to a new level with the Rocket's rooftop garden providing the restaurant tenant below with peppers, tomatoes, and other vegetables for use in their culinary works.

Figure 52 - Burnside Rocket Edible Roof

  - Passive Strategies: In obtaining LEED Platinum certification, the Burnside Rocket leverages natural ventilation, solar shading, thermal mass, and daylighting into energy savings.

- Triple Top Line Considerations: As the ultimate design authority on the Burnside Rocket

building, Kevin Cavenaugh recognizes that every design decision is an economic, ecological, and/or social consideration that typically adds or subtracts value from each concentration. While such considerations are largely pre-determined for architects and developers based on their fragmented interests, the architect-developer has the freedom to weigh each decision with regards to which direction will best meet the project's overall aims. This doesn't simply imply however, that in a socially driven development like the Burnside Rocket that social design decisions always prevail. For when certain social considerations prevent a project from being financially viable, there will be no added social value from a project that never gets built, no matter how equitable the design may be. A preferable alternative to this balancing act, which is successfully utilized by Cavenaugh, is leveraging the development's social and ecological assets to create economic value.

This spillover effect is evident in the LEED platinum level energy savings (50% lower than the standard) which allow the owner to increase rental income without increasing the total expenses paid by the tenant due to lower utility bills. Likewise, the Rocket's access to public transit and proximity to basic services eliminates the need for on-site parking, allowing the entire property to be utilized for leasable, income generating purposes. Finally, the project utilizes an aquifer running below the site to not only provide for all of the building's water needs and run its heating and cooling systems, but as an income generator stemming from the granting of water rights to other properties nearby. Still, there are instances where economy, ecology, and equity considerations are unable to be synthesized and in the case of structure and elevational materials, the economy of CMU bearing walls with bright paint on the exterior facades prevail. Yet with the preeminent social value of the elevation taking form in the window shade artwork, such a compromise has minimal bearing on the project as a social asset. It could even be argued that the vibrant red paint has become a marketing and public relations tool for the project. The Burnside Rocket's leveraging of strengths, mitigation and transformation of weaknesses, and creative integration of economy, ecology, and equity make it an effective precedent for triple top line development.

- 100 West Elder Project
    - Context: The 100 West Elder project is located in the Over-the-Rhine Historic District and borders the iconic Findlay Market House, which is known to attract the region's most culturally diverse crowds. The site's proximity to Cincinnati's major employment centers, above average public transit, and access to off street parking makes it appealing to the architect-developer, shareholders, and stakeholders alike from a social standpoint.

- Goals: The architect-developer goals, strategies, and tactics for the 100 West Elder Project are as follows.
  - Goal 1: Foster Community
    - Active Street Presence: 100 West Elder's ground floor transparency, multiple entries, and landscape architecture will foster a connection between the building and surrounding neighborhoods.
    - Building Art: In response to the strong arts culture in Over-the-Rhine, a combination of murals and sculpture by local artists will be integrated into the 100 West Elder building and surrounding landscape.

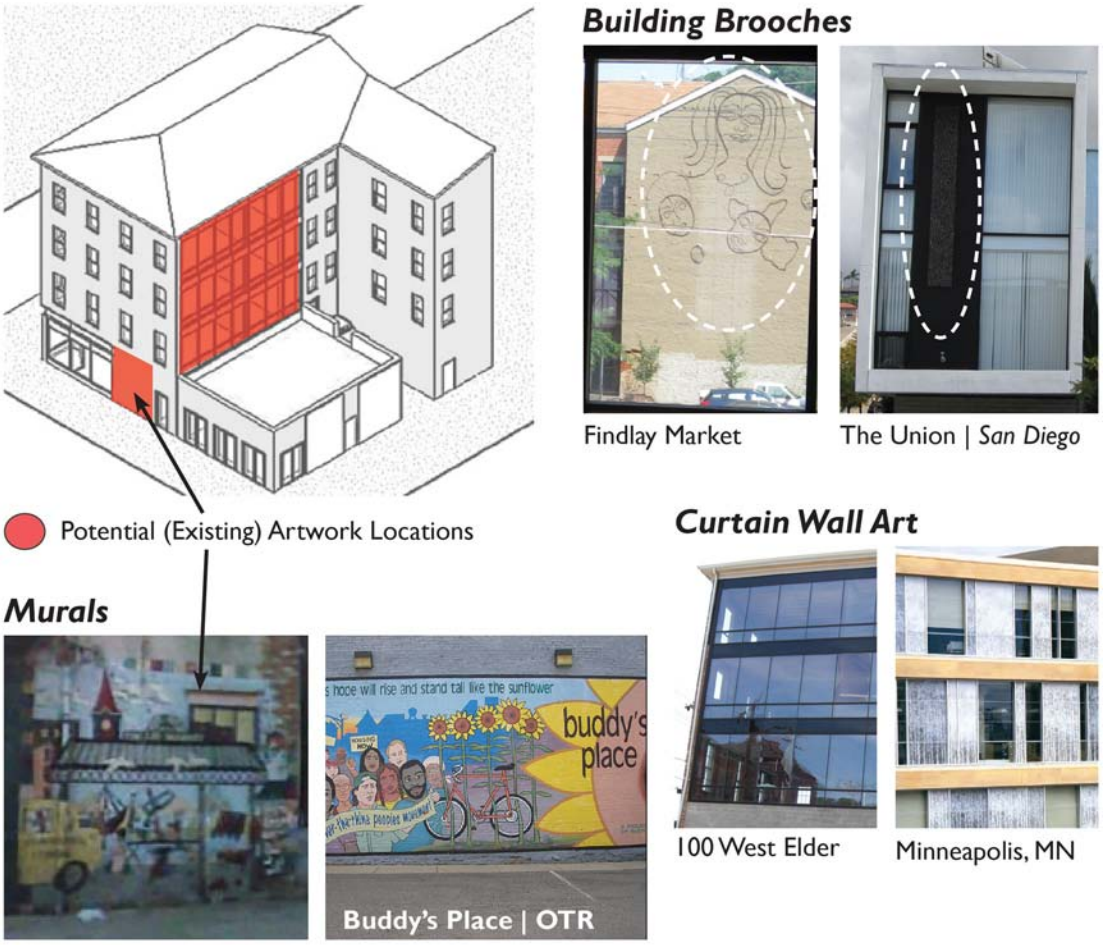


Figure 53 - 100 West Elder Art Opportunities

    - Social Space: A communal green roof atop the projects new office addition will facilitate social interaction amongst 100 West Elder residential tenants.

Figure 54 - 100 West Elder Roof Terrace Analysis

- Goal 2: Celebrate History
  - Historic Facade Preservation: The vibrant front face of the 100 West Elder building, which is a staple for properties lining the Market House, will be preserved to maintain the character of Findlay Market. However, the fact that many spaces beyond the vibrant facades are vacant and in disrepair suggests the face is more of a billboard for Findlay Market than anything else. This will be addressed in the treatment of elevations as the building turns the corner onto Race Street.
  - New Addition Design: New additions to historic buildings typically contrast or mimic the existing structure to which it is attaching itself. The approach for the 100 West Elder addition is more dynamic in that it will utilize materials that weather over time to express and chronicle its own history.

Figure 55 - New Addition Aging Study

- 'Derelicte' Aesthetic: Historic renovation, especially in Over-the-Rhine, tends to be very selective as to what is to be preserved and expressed, and what is to be concealed. As a result, renovation projects have been more about containing historic structures rather than complimenting and celebrating them. The 'Derelicte' aesthetic is based off of the 'Derelicte' fashion line promoted in the movie *Zoolander* where desolate wardrobes associated with the homeless and vagrants are re-contextualized and celebrated as high runway fashion. In applying the 'Derelicte' aesthetic to historic buildings, this means eliminating discriminatory attitudes towards aging and decay, by celebrating the entireties of assemblies rather than the novelty of a select few components.

Figure 56 - 'Derelicte' Fashion Images

A precedent for this unconventional type of adaptive reuse is the Capital Flats development in Northern Liberties, Philadelphia by designer-developer-builder, Onion Flats. In this meat packing plant turned apartments, detailing is not a product of designing, but rather of reading the existing context with interiors responding to present conditions and spontaneous dialogues over philosophical ideals (onionflats.com). Whereas conventional re-use projects often strip the rougher industrial features away, leaving minimal reminders of a building's history, Capital Flats' maintains many of the elements used by its butchers to turn sides of beef into dinner-size portions. Blood drains in the glazed-brick floors, metal appurtenances jutting from the walls and ceilings, and thick freezer doors enclosing bathrooms are a few of the holdovers which celebrate the building's unique history. The improvisational working style that drives the Capital Flats project is rare in modern practice because clients are simply unwilling to give the architects they hire the level of freedom this process requires. Tim McDonald, the lead architect-developer on the project says as much, admitting, "I was tired of hearing clients tell me I couldn't do certain stuff" (Saffron).

Figure 57 - Capital Flats 'Derelicte' Imagery

The 100 West Elder project will express the 'Derelicte' aesthetic by utilizing material contrasts and lighting to accentuate the dominance of the building's continuous vertical surfaces structurally, aesthetically, and historically. This will be carried out most directly in the connections of the new and old, and more specifically, where the contemporary flooring, ceilings and partitions meet the historic brick bearing walls.

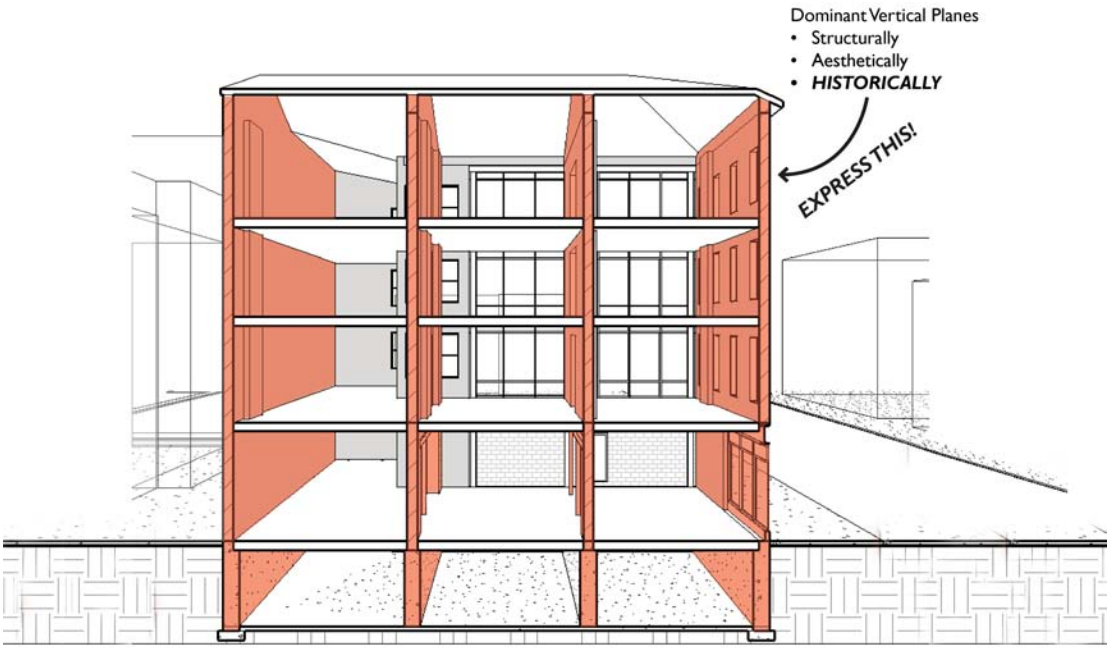


Figure 58 - 100 West Elder Section Perspective Diagram

Figure 59 - 100 West Elder 'Derelicte' Imagery

- Goal 3: Promote Sustainable Development
  - Storm Water Management: The 100 West Elder project will address Cincinnati's storm water runoff issues by retaining and treating all of its storm water on site, utilizing rain gardens, permeable surfaces, and a green roof to do so.

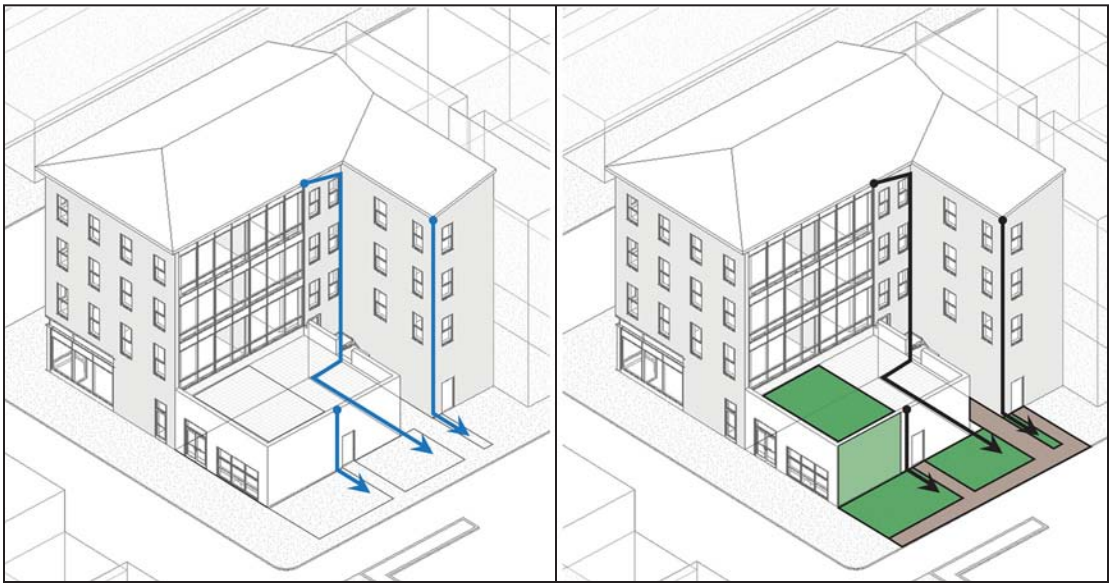


Figure 60 - Storm Water Management Diagrams

  - Passive Strategies: In obtaining LEED certification, the 100 West Elder project will leverage natural ventilation, solar shading, thermal mass, and daylighting to reduce energy consumption.

- Triple Top Line Considerations: Approaching this project as an architect-developer with the ultimate design authority, it became clear early on that every design decision made in the 100 West Elder development is an economic, ecological, and/or social consideration that will add or detract value from each concentration. The challenge, then is determining what design decisions will best meet the project's overall aims as a socially driven development. The most effective solutions are those that leverage economic, ecological, and/or social assets to create value in other areas of the fractal triangle, a scenario that is realized time and again in the 100 West Elder project, and what ultimately makes the development financially feasible.

  The spillover effect is evident in the project's historic preservation component in that while maintaining the distinctive Findlay Market character, the re-use also cuts down on material waste and economically provides the project with equity sources in the form of state and federal historic preservation tax credits. Likewise, the new commercial component, by adding local jobs and treating stormwater runoff on site, helps the property qualify for Community Development Block Grant (CDBG) monies and green building tax abatements that contribute additional equity to the project. Still, there are plenty of instances within the 100 West Elder project where economy, ecology, and equity considerations are unable to be harmonized requiring the development of a decision making hierarchy.

  This decision making hierarchy is effectively implemented in the interior treatment of the triple wythe brick walls and glass curtain wall that surround the perimeter of the project where what is socially and economically preferable, conflicts with what is environmentally desirable. While thermally inefficient, two key amenities for the apartments are the exposed brick interiors and the north facing wall of glazing framing gorgeous views of uptown. In the end, the decision making proceess resulted in the election to keep the curtain wall, as it transforms the character of the space and tells a compelling story about the building history with a minimal amount up front cost. In terms of the brick interior, the choice was made to leave the southern wall exposed to take advantage of its thermal mass properties, which was also the case for the western wall since it is a shared common wall with the building next door and of little environmental consequence. The treatment of the northern brick wall, on the other hand, is the addition of spray foam insulation to prevent excess heat loss, while the eastern walls are varied in terms of exposure to accomodate programmatic needs. Overall, 100 West Elder's leveraging of strengths, mitigation and transformation of weaknesses, and creative integration of economy, ecology, and equity make it an effective example of triple top line development, which is largely facilitated by the architect-developer structure.

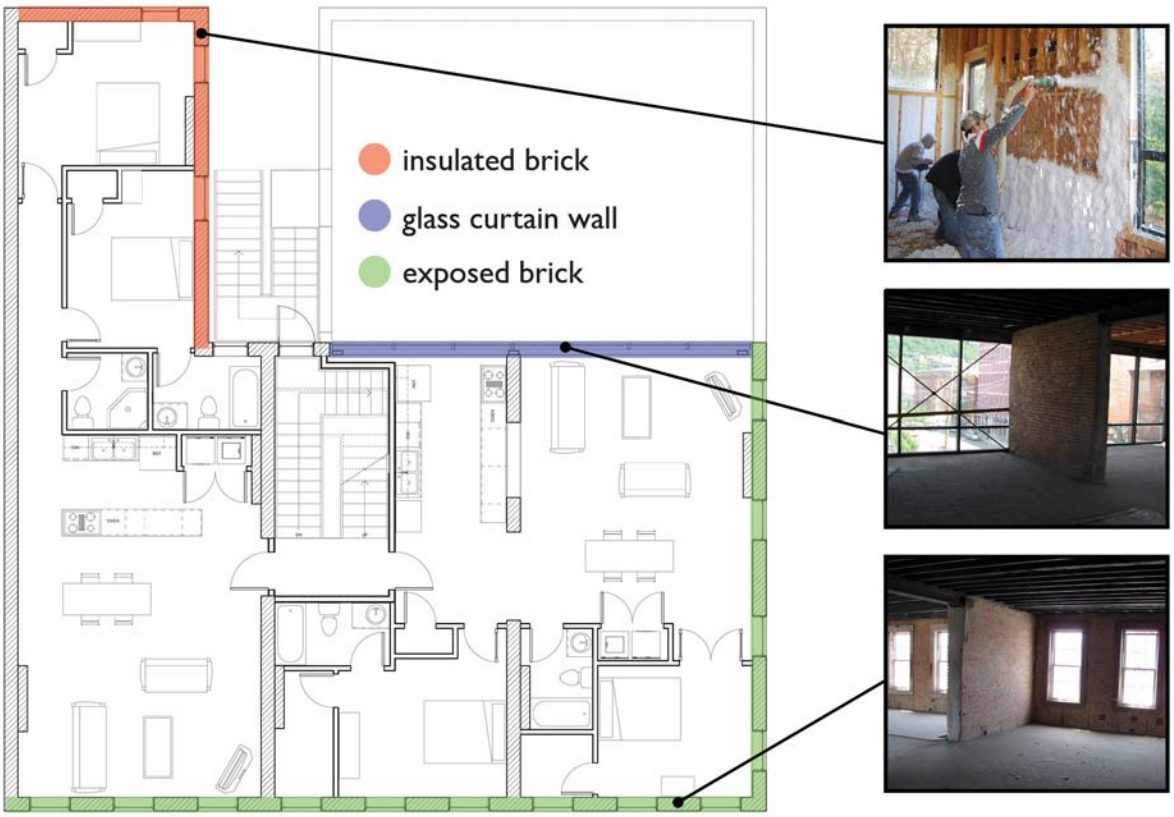


Figure 61 - Wall Treatment Diagram

Pro Forma

The *pro forma* is a financial operating statement that projects how a development will perform for a future period based on a set of specific assumptions. To create a *pro forma*, the architect-developer must first determine a project's expected income and expenses, costs, and sources of financing. The *pro forma* serves multiple functions at every stage of the development process organizing, selling, and evaluating performance, while accounting for individual player involvement along the way. The *pro forma* is the primary indicator of future project success and is required to obtain any type of construction loan or permanent financing. The 100 West Elder *pro forma* and design were developed alongside one another allowing for a complimentary dialogue among the disciplines in which design priorities inform financial decisions and financial priorities inform design decisions. This back-and-forth discussion is unique to the architect-developer model and facilitates a progressive project maturation through construction that is lacking under the traditional development structure. The following bullet points highlight a few of the key findings from the 100 West Elder *pro forma*, which can be found in its entirety in the appendix. Please note that the numbers below are rounded to the nearest $100 value for simplicity's sake.

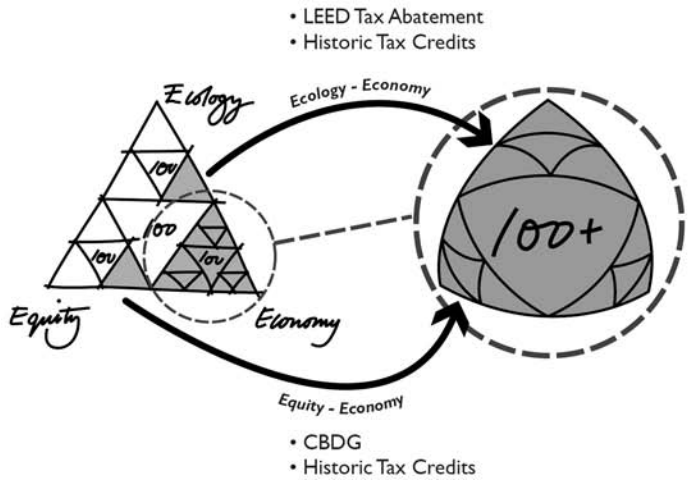
- Forecasted Operating Statement: The 100 West Elder operating statement makes use of the

market analysis, program, and design to determine the amount of income the project can be expected to generate from rents and other sources. Based on square footages, amenities, and comparables, all indications point to the six apartments generating an annual base rent of $81,000 and the two commercial spaces accruing $42,100. Together, these amounts total a potential gross income (PGI) for the project of $123,100 annually. However, this number fails to account for potential losses from vacancy and collection losses (assumed to be 10% of PGI) and operating expenses (assumed to be 20% of PGI) which must be paid. Once these elements are accounted for, the resulting net operating income (NOI) for the project turns out to be $88,600 per year. Once the NOI is calculated it can be divided by the cap rate, which in this case is assumed to be 8.5% to estimate the project's value, which will ultimately be used along with the total project cost to determine the financing structure and feasibility. The 100 West Elder project value based on an 8.5% cap rate is $1,042,800.

- Forecasted Project Costs: The 100 West Elder project costs consist of site acquisition costs (land costs), construction costs (or hard costs), and miscellaneous fees, contingencies, and payments known as soft costs. The land cost for the 100 West Elder site is assumed to be $26,100, with the hard costs (calculated based on an assemblies cost estimate) amounting to $978, 400, and soft costs coming in at $293,500 for a total project cost of $1,298,000. It is worth noting here that despite the relatively frugal design proposal of the architect-developer, the project costs at this point exceed the value of the completed development, indicating the project is not financially feasible unless some sort of subsidy is available to effectively lower project costs. Fortunately for the 100 West Elder project, the social and ecological value of adaptive re-use projects in Over-the-Rhine is recognized by federal, state, and local governments in the form of tax credits, tax abatements, and grants offered to developers to close such financing gaps.

- Forecasted Financing: Real estate development projects are typically financed utilizing a combination of debt (which are loans from a bank or other lender) and equity (which are funds invested by an 'owner' or other interested party) and the 100 West Elder project is no exception. What is somewhat unique about the project, though, is the way the debt and equity are structured to make the project feasible, with debt financing accounting for only 48% of the total development costs, tax credits, abatements, and grants making up a surprising 43% of total costs, deferred fees representing 4% of the amount, and developer equity covering the remaining 5% of project costs. Ultimately, the 43% of funding coming from discounted Federal and State Historic Tax Credits, Green Building Commercial Property Tax Exemptions, and a Community Development Block Grant (CDBG), is what makes the 100 West Elder project feasible, effectively lowering the total development cost by $558,100. As a result, the project instantly becomes profitable (with the

$1,042,800 value exceeding the 'revised' $739,900 cost), cash flows (with NOI exceeding debt service by $35,000+ a year), and provides the developer and his investors with an acceptable rate of return for the level of risk assumed. In summary, the leveraging of the 100 West Elder project as a social and ecological asset to create economic value in the form of historic tax credits, CDGBs, and green building tax abatements is what makes the project financially viable.



100 WEST ELDER FINANCIAL BREAKDOWN

48% Debt
- Bank loans (construction, permanent)

43% Tax Credits, Grants, Abatements
- Historic Tax Credit (federal, state)
- CDBG
- LEED Tax Abatement

4% Deferred Fees
- Developer Fee

5% Developer Equity
- Architect-Developer's own money

Figure 62 - 100 West Elder Financial Breakdown

Conclusion

The goal of triple top line development is the creation of buildings that are at the same time economic, ecological, and social assets that benefit both shareholders and stakeholders. The 100 West Elder project, while not perfect, is largely successful in achieving this mission. Economically, the project *pro forma* suggests the project will be profitable and thus financially feasible. Ecologically, the development eliminates the need for a car, salvages an existing building, and treats stormwater runoff on site. Finally, socially, the building project fights neighborhood blight, adds jobs, and provides outdoor communal spaces. In the end the project benefits the investor, the city, the patron, and the environment in a win-win-win scenario that embodies what the architect-developer model for triple top line development is all about.

Figure 63 - Findlay Market Storefronts

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Appendix A: 100 West Elder Pro Forma | *Operating Statement*

Residential Key Indicators		Sq. Ft. per Unit	Total Units	Total Sq. Ft.	Average Monthly Rent	Monthly Rent Per Square Foot	Monthly Figures	Annual Figures	Per Unit Figures
Project Configuration									
2 Bedroom / 2 Bath		1150	3	3450	$1,200.00	$1.04	$3,600.00	$43,200.00	
2 Bedroom / 2 Bath		1057	3	3171	$1,050.00	$0.99	$3,150.00	$37,800.00	
3 Bedroom / 2 Bath									
Total Base Rent			6	6621			$6,750.00	$81,000.00	$13,500.00
Other Income							$0.00	$0.00	
Potential Gross Income							$6,750.00	$81,000.00	$13,500.00
Vacancy/Collection Loss	10.0%						($675.00)	($8,100.00)	
Effective Gross Income							$6,075.00	$72,900.00	
Operating Expenses	20.0%						($1,215.00)	($14,580.00)	($2,430.00)
Net Operating Income							$4,860.00	$58,320.00	$9,720.00
Valuation Indicators	**Cap Rate**							**Total Valuation**	**Per Unit Value**
Value at cap rate of:	8.0%							$729,000.00	$121,500.00
Value at cap rate of:	8.5%							$686,117.65	$114,352.94
Value at cap rate of:	9.0%							$648,000.00	$108,000.00

Commercial Key Indicators		Total Sq. Ft.	Annual Rent Per Square Foot	Annual Rent
Tenant				
Tenant 1		2002	$15.00	$30,030.00
Tenant 2		863	$14.00	$12,082.00
Total Base Rent		2865		$42,112.00
Other Income				$0.00
Potential Gross Income				$42,112.00
Vacancy/Collection Loss	10.0%			($4,211.20)

Operating Statement *(Continued)*

Effective Gross Income				$37,900.80					
Operating Expenses	20.0%			($7,580.16)					
Net Operating Income				$30,320.64					
Net Operating Income Key Indicatiors									
NOI Apartments			$58,320.00	65.8%					
NOI Commercial Spaces			$30,320.64	34.2%					
Net Operating Income			$88,640.64	100.0%					
Debt Service			($53,531.78)						
Debt Service Coverage Ratio			1.30						
Pre-Tax Cash Flow			$35,108.86						
Valuation Indicators	**Cap Rate**		**Total Valuation**						
Value at cap rate of:	8.0%		$1,108,008.00						
Value at cap rate of:	8.5%		$1,042,831.06						
Value at cap rate of:	9.0%		$984,896.00						

Rehab Construction 'Systems' Costs

Assembly Number	Description	Qty.	Unit	Total Cost Unit	Total Cost Total	Cost Per S.F.
DIVISION A	**SUBSTRUCTURE**					
A10	**Foundations**					
	Existing					
A20	**Basement Construction**					
	Existing					
	Subtotal Division A				$0	$0.00
DIVISION B	**SHELL**					
B10	**Superstructure**					
B1010-261-3700	Floor Construction	880	S.F.	4.07	$3,582	
	Subtotal, Division B10, Superstructure				$3,582	$0.33
B20	**Exterior Closure**					
B2010-146-1400	Metal Siding Panel	92	S.F.	5.54	$510	
B2020-106-7500	Aluminum Windows	54	EA.	1,036.00	$55,944	
B2030-110-6300	Glazed Exterior Doors, w/ Transom	1	EA.	2,245.00	$2,245	
B2030-110-6900	Glazed Exterior Doors, w/ Transom	1	EA.	2,735.00	$2,735	
B2030-220-3450	Steel Exterior Doors	1	EA.	1,458.00	$1,458	
	Subtotal, Division B20, Exterior Closure				$62,892	$5.83
B30	**Roofing**					
B3010-620-2000	Downspouts	144	V.L.F.	4.64	$668	
	Subtotal, Division B30, Roofing				$668	$0.06
DIVISION C	**INTERIOR CONSTRUCTION**					
	Partitions					
C1010-126-5400	Drywall Partitions/Metal Stud Framing	16447	S.F.	3.70	$60,854	
C1010-126-6200	Drywall Partitions/Metal Stud Framing at Stair Core	11827	S.F.	5.46	$64,575	
	Exterior Wall					
C1010-128-0649	Furring, 1-1/2" Steel Channels @ 24" O.C.	1000	S.F.	1.56	$1,560	
C1010-128-0700	Insulation, Rigid 1" Thick	1000	S.F.	0.88	$880	
C1010-128-0920	Gypsum Board, 5/8" Fire Rated	1000	S.F.	1.00	$1,000	
C1010-128-0960	Tape and Finish	1000	S.F.	0.50	$500	

Rehab Construction 'Systems' Costs (Continued)

	Interior Doors & Hardware					
C1020-114-1000	Interior Metal Door / Metal Frame	10	EA.	760.00	$7,600	
C1020-120-2000	Interior Wood Door / Wood Frame	27	EA.	326.00	$8,802	
C1020-120-2160	Interior Wood Door / Wood Frame Double	6	EA.	690.00	$4,140	
	Fittings					
C1030-710	Bath and Toilet Accessories				$5,470	
C1030-830	Fabricated Kitchen Base Cabinets	60	L.F.	251.00	$15,060	
C1030-830	Fabricated Kitchen Wall Cabinets	48	L.F.	195.50	$9,384	
C1030-830	Fabricated Kitchen Countertops, Corian	72	L.F.	75.00	$5,400	
C1030-830	Fabricated Bathroom Vanity Casework, 36"	12	EA.	339.50	$4,074	
C1030-830	Fabricated Bathroom Vanity Counterops, 37"	12	EA.	344.00	$4,128	
	Stairs					
C2010-110-0660	Exterior Stairs, Steel, Grate Type	1	FLIGHT	9,100.00	$9,100	
C2010-110-0920	Interior Stairs, Steel, Pan Tread	4	FLIGHT	12,900.00	$51,600	
C2010-110-1120	Basement Stairs, Wood Prefab	2	FLIGHT	2,255.00	$4,510	
	Wall Finish					
C3010-230-0140	Wall Finish, Painted Drywall	60500	S.F.	0.71	$42,955	
	Floor Finish					
C3020-410	Linoleum Floors	1675	S.F.	5.50	$9,213	
C3020-410	Bamboo Floors	5575	S.F.	8.00	$44,600	
	Ceiling Finish					
C3030-110-5700	Ceiling Finishes, Drywall Ceilings	7085	S.F.	3.32	$23,522	
	Subtotal, Division C, Interior Construction				$378,927	$35.10

DIVISION D	**SERVICES**					
D20	**Plumbing**					
D2010-410-1800	Kitchen Sink System	7	EA.	1,285.00	$8,995	
D2010-922-2240	Two Fixture Bathroom, One Wall Plumbing	2	EA.	2,350.00	$4,700	
D2010-924-2240	Three Fixture Bathroom, One Wall Plumbing	6	EA.	3,200.00	$19,200	
D2010-926-2240	Three Fixture Bathroom, Two Wall Plumbing	6	EA.	3,450.00	$20,700	
D2020-240-1820	Electric Water Heater, Commercial	8	EA.	5,565.00	$44,520	
	Plumbing Subtotal				$98,115	
RD2010-031	Control (10%), Fittings (30%), Quality/Comp. (10%)				$49,058	
	Subtotal, Division D20 Plumbing				$147,173	
D30	**HVAC**					
D3030-214-1200	Heating/Cooling, Gas Fired Forced Air, 1200 SF	6	EA.	6,882.08	$41,292	
D3030-214-1200	Heating/Cooling, Gas Fired Forced Air, 2000 SF	1	EA.	10,069.96	$10,070	

Rehab Construction 'Systems' Costs (Continued)

	Subtotal, Division D30 HVAC				$51,362	
D40	**Fire Protection**					
D50	**Electrical**					
RD5010-117	Cost per S.F for Total Electirc Systems, Low Rise Apt.	7030	S.F.	7.12	$50,054	
RD5010-117	Cost per S.F for Total Electirc Systems, Donut Shop	2000	S.F.	20.62	$41,240	
	Subtotal, Division D50 Electrical				$91,294	
	Subtotal, Division D, Services				$289,829	$26.85

DIVISION E	**EQUIPMENT & FURNISHINGS**

E10	**Equipment**					
E1090-410-0110	Range, Cook Top, 4 Burner	6	EA.	324.00	$1,944	
E1090-410-0120	Built In, Single Oven, 30" Wide	6	EA.	602.00	$3,612	
E1090-410-0170	Dish Washer, Built In	6	EA.	561.00	$3,366	
E1090-410-0220	Refrigerator, 21 to 29 C.F.	6	EA.	1,250.00	$7,500	
E1090-410-0300	Stacked Washer and Dryer	6	EA.	1,250.00	$7,500	
	Subtotal, Division E10 Equipment				$23,922	
E20	**Furnishings**					
E2010-320-0130	Window Treatment, Vertical Blinds and Track	555	S.F.	8.89	$4,934	

DIVISION F	**SPECIAL CONSTRUCTION & DEMOLITION**

F20	Building Demolition	1		20,000.00	$20,000	

DIVISION G	**SITE WORK**

G10	**Site Preparation**					
G1020-200	Demolition of Site Components, Concrete	148	S.Y.	8.68	$1,285	
G1030-100	Site Grading, Excavation and Disposal	100	C.Y.	8.43	$843	
G20	**Site Improvements**					
G2030-120-1580	Concrete Sidewalks	100	L.F.	15.90	$1,590	
G2040-100	Fences and Gates	1		350.00	$350	
G2050	Landscaping	1		2,500.00	$2,500	
G30	**Site Mechanical Utilities**					

Rehab Construction 'Systems' Costs *(Continued)*

G3010-110-6090	Water Distribution Piping	50	L.F.	4.27	$214	
G3020-110-4150	Drainage and Sewage Piping	100	L.F.	14.85	$1,485	
G3060-110-2110	Gas Service Piping	50	L.F.	9.55	$478	
	Subtotal, Division G, Site Work				$8,744	
					$793,497	$73.51

New Construction 'Systems' Costs

Assembly Number	Description	Qty.	Unit	Total Cost Unit	Total Cost Total	Cost Per S.F.
DIVISION A	**SUBSTRUCTURE**					
A10	**Foundations**					
	Existing					
A20	**Basement Construction**					
	Existing					
	Subtotal Division A				$0	$0.00
DIVISION A	**SUBSTRUCTURE**					
DIVISION B	**SHELL**					
B10	**Superstructure**					
B1010-208-1600	Steel Columns (50K), 9 x 10'	90	V.L.F.	31.40	$2,826	
B1010-246-1250	Floor Construction	863	S.F.	9.61	$8,293	
B1020-112-2700	Roof Construction	863	S.F.	5.81	$5,014	
	Subtotal, Division B10, Superstructure				$16,133	$16.95
B20	**Exterior Closure**					
B2010-146-1400	Metal Siding Panel	980	S.F.	5.54	$5,429	
B2010-154-3000	Metal Siding Support	980	S.F.	5.23	$5,125	
B2020-210-1800	Tubular Aluminum Window Framing	84	S.F.	35.15	$2,953	
B2030-110-6950	Glazed Exterior Doors	1	EA.	4,525.00	$4,525	
B2030-220-3450	Steel Exterior Doors	1	EA.	1,458.00	$1,458	
	Subtotal, Division B20, Exterior Closure				$19,490	$20.47
B30	**Roofing**					
B3010	Extensive Green Roof Assembly	850	S.F.	10.00	$8,500	
B3010-410-1000	Base Flashing	120	L.F.	22.20	$2,664	
B3010-620-1400	Downspout	11	V.L.F.	4.54	$50	
	Subtotal, Division B30, Roofing				$11,214	$11.78
DIVISION C	**INTERIOR CONSTRUCTION**					

New Construction 'Systems' Costs (Continued)

	Partitions					
C1010-126-5400	Drywall Partitions/Metal Stud Framing	330	S.F.	3.70	$1,221	
	Exterior Wall					
C1010-128-0649	Furring, 1-1/2" Steel Channels @ 24" O.C.	658	S.F.	1.56	$1,026	
C1010-128-0700	Insulation, Rigid 1" Thick	658	S.F.	0.88	$579	
C1010-128-0920	Gypsum Board, 5/8" Fire Rated	658	S.F.	1.00	$658	
C1010-128-0960	Tape and Finish	658	S.F.	0.50	$329	
	Interior Doors & Hardware					
C1020	Interior Doors Sliding 4 Panel	1	EA.	2,200.00	$2,200	
C1020-114-1000	Metal Door/Metal Frame	2	EA.	760.00	$1,520	
	Fittings					
C1030-710	Bath and Toilet Accessories				$335	
	Wall Finish					
C3010-230-0140	Wall Finish, Painted Drywall	1250	S.F.	0.71	$888	
	Floor Finish					
C3020-410-0740	Floor Finish, Exposed Aggregate Finish	863	S.F.	0.87	$751	
	Ceiling Finish					
C3030-110-5700	Ceiling Finishes, Drywall Ceilings	195	S.F.	3.32	$647	
	Subtotal, Division C, Interior Construction				$10,154	$10.67

DIVISION D	**SERVICES**

D20	**Plumbing**					
D2010-922-2240	Two Fixture Bathroom, One Wall Plumbing	1	EA.	2,350.00	$2,350	
D2020-240-1820	Electric Water Heater, Commercial	1	EA.	5,565.00	$5,565	
D2040-210-1960	Roof Drain System	1	EA.	882.00	$882	
D2040-210-2000	Roof Drain, Additional Length	25	L.F.	22.06	$552	
	Plumbing Subtotal				$9,349	
RD2010-031	Control (10%), Fittings (30%), Quality/Comp. (10%)				$4,674	
	Subtotal, Division D20 Plumbing				$14,023	
D30	**HVAC**					
D3030-214-1200	Heating/Cooling, Gas Fired Forced Air	1	EA.	6,882.08	$6,882	
D40	**Fire Protection**					
D50	**Electrical**					

New Construction 'Systems' Costs (Continued)

D5010-120-0240	Service, 100 Amp	1	EA.	2,070.00	$2,070	
D5010-230-0240	Feeders, 100 Amp	50	L.F.	25.35	$1,268	
D5020-110-0640	Receptacles	863	S.F.	3.08	$2,658	
D5020-130-0360	Wall Switches 5/1000 S.F.	863	S.F.	1.08	$932	
D5020-210-0280	Lighting	644	S.F.	6.80	$4,379	
	Subtotal, Division D50 Electrical				$11,307	$11.88
	Subtotal, Division D, Services				$32,212	$33.84

DIVISION E	**EQUIPMENT & FURNISHINGS**

DIVISION F	**SPECIAL CONSTRUCTION & DEMOLITION**

DIVISION G	**SITE WORK**					
					$89,203	$93.70

Total Construction 'Systems' Cost Summary

Division		Description	Subtotal Cost	Cost/S.F.	Percentage
A		Substructure	$0	$0.00	0.0%
B10		Shell: Superstructure	$19,715	$1.68	2.2%
B20		Shell: Exterior Closure	$82,382	$7.02	9.3%
B30		Shell: Roofing	$11,882	$1.01	1.3%
C		Interior Construction	$389,081	$33.14	44.1%
D10		Services: Conveying	$0	$0.00	0.0%
D20		Services: Plumbing	$161,195	$13.73	18.3%
D30		Services: HVAC	$58,245	$4.96	6.6%
D40		Services: Fire Protection	$0	$0.00	0.0%
D50		Services: Electrical	$102,600	$8.74	11.6%
E		Equipment & Furnishings	$28,856	$2.46	3.3%
F		Special Construction	$20,000	$1.70	2.3%
G		Site Work	$8,744	$0.74	1.0%
		Building Subtotal	$882,700		
Sales Tax		__ % x Subtotal / 2			
General Conditions	5.0%	x Subtotal			$44,135.00
				Subtotal "A"	$926,835.03
Overhead	7.0%	x Subtotal "A"			$64,878.45
				Subtotal "B"	$991,713.48
Profit	7.0%	x Subtotal "B"			$69,419.94
				Subtotal "C"	$1,061,133.43
Location Factor	92.2%	x Subtotal "C"	Cincinnati	Localized Cost	$978,365.02
~~Architects Fee~~	~~8.5%~~	~~x Localized Cost =~~			
Contingency	2.0%	x Localized Cost =			$19,567.30
				Project Total Cost	$997,932.32
Square Foot Cost		$ / 11740 S.F. =		S.F. Cost	$85.00
Cubic Foot Cost		$ / 610480 C.F. =		C.F. Cost	$1.63

Total Project Cost Summary

Key Indicators				
HARD COSTS				
Rehab Costs			$784,753	
New Addition Costs			$89,203	
Site Work			$8,744	
General Conditions		5%	$44,135	
Overhead		7%	$64,878	
Profit		7%	$69,420	
Subtotal			$1,061,133	
Location Factor	Cincinnati	92.2%		
Hard Costs Total			**$978,365**	
~~*Contingency/Change Orders*~~		~~*2.0%*~~	~~*$19,567*~~	
LAND COSTS				
Land	Acres	0.113	**$26,100**	
HARD COSTS + LAND			**$1,004,465**	
SOFT COSTS				
Project Contingency		3.0%	$29,351	
Pre-Dev Consultants		1.0%	$9,784	
Architecture & Engineering		7.0%	$68,486	
Development Fees		5.0%	$48,918	
Permit Fees		2.0%	$19,567	
Legal & Accounting		4.0%	$39,135	
Construction Financing & Carrying		4.5%	$44,026	
Permanent Financing		2.0%	$19,567	
Leasing		1.5%	$14,675	
Total Soft Costs		30.0%	**$293,510**	
SUMMARY				
Hard Costs			$26,100	
Land			$978,365	
Soft Costs			$293,510	
Total Project Costs			**$1,297,975**	

Pro Forma 'Master Sheet'

PROJECT FACTS:				
Site Area				4,800
Number of stories				4
Gross Storefront Area			incl.	
Gross Office Area			incl.	
Gross Residential Area			incl.	
Net Leasable Storefront	Tentant 1			2,002
Net Leasable Office	Tentant 2			863
Net Rentable Residential				6,621
Number of Residential Units	6			
Number of tenants	8			
GROSS BUILDING AREA		per plans		11,747
TOTAL NET LEASABLE				9,486
Overall Efficiency				81%
Storefront Rent/ s.f.	**15.0**	**NNN**		**$2,503**
Office Rent/s.f.	**14.0**	**NNN**		**$1,007**
Apartment 1 Rent				**$1,200**
Apartment 2 Rent				**$1,050**
Apartment 3 Rent				**$1,200**
Apartment 4 Rent				**$1,050**
Apartment 5 Rent				**$1,200**
Apartment 6 Rent				**$1,050**
Misc Income				**$ -**
Floor Area Ratio				**2.45**
LAND COST				**$ 26,100.00**

OPERATING PRO FORMA (PER YEAR)		
Gross Retail Income	$ 15	$30,030
Gross Office Income	$ 14	$12,082
Gross Residential Income		$81,000
Misc. Income		
(-) Vacancy - Storefront	10%	($3,003)
(-) Vacancy - Office	10%	($1,208)
(-) Vacancy - Residential	10%	($8,100)
(-) Fire Insurance - Comm.	?	$0
(-) Fire Insurance - Other	?	$0
(-) Taxes - Commercial		$0
(-) Taxes - BETC & Fed Savings		$0
(-) Water		$0
(-) Utilities		$0
(-) Repairs & Maintenance	?	$0
(-) Replacement Reserves	?	$0
(-) Misc. Expenses		$0
(-) Commercial Management (In House)	?	$0
Total Expenses	20.0%	($22,160)
NET OPERATING INCOME		**$ 88,641**

CONSTRUCTION LOAN		
Interest Rate		8.50%
Term (Months)		18
Construction Loan		**625,699**
Loan-to-Cost		**48.21%**
Loan-to-Value		**60%**
Drawdown Factor	9 mo. X 0.6	45%
Annual Debt Service		**$23,933**

PROJECT COSTS				
Land Value	**$5.44**	**sq.ft.**	**$**	**26,100**
Building Hard Costs	**$83.29**	**sq.ft.**	**$**	**978,365**
Project Contingency	3.0%	of hd costs	**$**	**29,351**
Pre-Dev Consultants	1.0%	of hd costs	**$**	**9,784**
Architecture & Engineering	7.0%	of hd costs	**$**	**68,486**
Development Fees	5.0%	of hd costs	**$**	**48,918**
Permit Fees	2.0%	of hd costs	**$**	**19,567**
Legal & Accounting	4.0%	of hd costs	**$**	**39,135**
Construction Financing & Carrying	4.5%	of hd costs	**$**	**44,026**
Permanent Financing	2.0%	of hd costs	**$**	**19,567**
Leasing	1.5%	of hd costs	**$**	**14,675**
Total Soft Costs	**$ 24.99**	**sq. ft.**	**$**	**293,510**
Total Soft Costs	30.0%	of hd costs		
TOTAL PROJECT COST	**$113.71**	**sq.ft.**	**$**	**1,297,975**

Pro Forma 'Master Sheet' *(Continued)*

PERMANENT FINANCING ASSUMPTIONS		
	DCR	LTV
Loan Amount	**$796,972**	**$625,699**
Interest Rate	7.700%	7.700%
Term (Years)	30	30
Debt-Coverage Ratio	1.30	
Project Value		$1,042,831
Loan-to-Value		60%
Value per Net Square Foot		$110
Stabilized NOI	$88,641	$88,641
CAP Rate		8.500%
Supportable Mortgage	**$625,699**	
Supportable Debt Service	($53,532)	

CASH FLOW CALCULATION (PER YEAR)			
TOTAL DEVELOPMENT COST		$1,297,975	
(-) Permanent Financing		($625,699)	48.2%
(-) Equity in Land		$0	0.0%
(-) Development Fee		($48,918)	3.8%
(-) Architect Fee		$0	0.0%
(-) Federal Historic Tax Credit		($177,965)	13.7%
(-) State Historic Tax Credit		($157,028)	12.1%
(-) Community Development Block Grant		($120,000)	9.2%
(-) Low Income Housing Tax Credit		$0	0.0%
(-) Commercial Tax Abatement		($100,000)	7.7%
EQUITY REQUIRED		$68,365	5.3%
NET OPERATING INCOME		$88,641	
(-) MORTGAGE		($53,532)	($4,461)
NET CASH FLOW		**$35,109**	
Equity-to-Cost Ratio	**51.79%**		

	YR 1	YR 2	YR 3	YR 4	YR 5	YR 6	YR 7	YR 8	YR 9	YR 10
Revenue (3% escalator)	110,801	114,125	117,549	121,075	124,707	128,448	132,302	136,271	140,359	144,570
Expenses (3% escalator)	(22,160)	(22,825)	(23,510)	(24,215)	(24,941)	(25,690)	(26,460)	(27,254)	(28,072)	(28,914)
NOI	88,641	91,300	94,039	96,860	99,766	102,759	105,842	109,017	112,287	115,656
Debt Service	(53,532)	(53,532)	(53,532)	(53,532)	(53,532)	(53,532)	(53,532)	(53,532)	(53,532)	(53,532)
NET CASH FLOW	35,109	37,768	40,507	43,328	46,234	49,227	52,310	55,485	58,756	62,124
RETURN ON INVESTMENT	10.4%	11.2%	12.0%	12.8%	13.7%	14.6%	15.5%	16.5%	17.4%	18.4%
Combined DCR	**1.66**	1.71	1.76	1.81	1.86	1.92	1.98	2.04	2.10	2.16
PROJECT APPRECIATION (3%)	$1,042,831	$1,074,116	$1,106,339	$1,139,530	$1,173,716	$1,208,927	$1,245,195	$1,282,551	$1,321,027	**$1,360,658**
NET SALES PROCEEDS										**$1,265,412**
LOAN BALANCE										**$545,441**
TOTAL EQUITY										**$719,971**
10 yr IRR (on Developer Equity)	**62%**									
10 yr IRR (on Total Equity)	**7.4%**									
10 yr IRR (on Debt)	**8.4%**									

Appendix B: Glossary of Terms

- **Eco-efficiency:** strategy for "sustainability" that minimizes harm to natural systems by reducing the amount of waste and pollution generated by human activities.
- **Eco-effectiveness:** strategy for designing projects that are safe, profitable, and regenerative, producing economic, ecological, and social value.
- **Sierpinski Tile:** fractal triangle that embodies the concept of the triple top line by representing the ecology of human concerns, showing how ecology, economy and equity anchor a spectrum of value, and how, at any level of scrutiny, each design decision has an impact on all three. In planning triple top line developments, designers move around the fractal inquiring how a new design can generate value in each category. The goal is not to balance competing perspectives but to optimize and maximize value in all areas of the triangle through intelligent design.
- **Triple bottom line:** method of accounting that attempts to quantify the social and environmental impact of a building in a way comparable to its economic impact, to show improvements and permit more in-depth evaluations regarding building projects.
- **Triple top line:** moves accountability to the beginning of the design process, assigning value to a multiplicity of economic, ecological and social questions that enhance project value. Asked up-front, these questions can drive intelligent development and lead to design decisions that yield positive effects rather than limited liabilities.