LONGEVITY THROUGH ADAPTATION:
Finding the Ideal Recipe for Adaptive Reuse Opportunities in the City of Pittsburgh Based on Building Technology and Typology

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Subject

Despite the advances made in building technology and construction methods over the last few centuries, the construction industry in the United States has seldom put an emphasis on building longevity and design service life. Because of this, building systems begin to critically fail within a few decades because of decisions made at the time of original construction, often to save money. While heating and cooling systems may need to be updated, or eroding building materials replaced , there is another intangible but equally important system that will likely change: the program. The cost of updating these systems, especially in regards to repurposing the use of a building, will often be so prohibitive to property owners that tearing down a building and starting fresh seems to be the best solution. Unfortunately, if deconstruction is followed by construction without emphasis on longevity and reuse, the cycle is only bound to continue indefinitely.

These typical methods of construction, though sometimes flawed, are greatly dictated by regional factors. An architecture vernacular is determined by the regional climate, resources, construction trade, means of fabrication, and the era or styles of the time. These localized needs lead to similar methodologies in construction. By observing these similar methodologies, you will also begin to see similar vulnerabilities- things that will need to be fixed, things that work inefficiently. The potential solution to these vulnerabilities should be to fix the apparent problems and prevent new problems from developing.

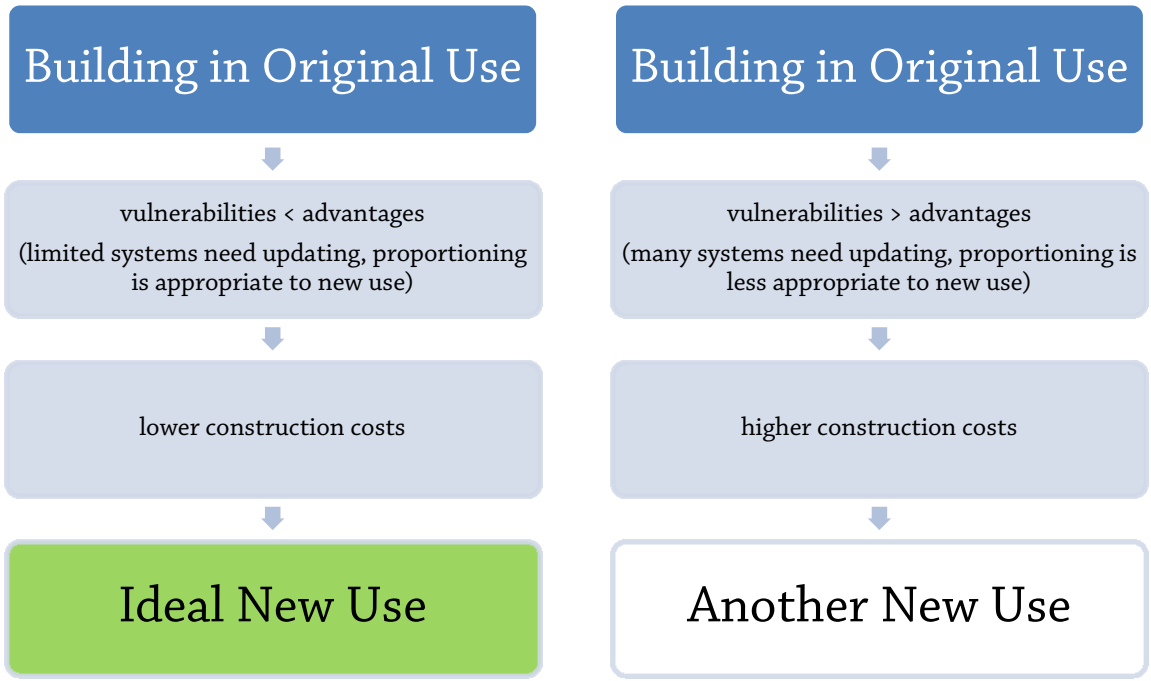
If we can have a better understanding of the vulnerabilities of the vernacular construction and the place-specific methods of combating those problems, can we establish a language for adaptive reuse solutions? How can we fix what we have already built, and repurpose the buildings that no longer serve their original purpose? Do certain building types within a regional fabric provide the foundation for certain types of adaptive reuse and a new programmatic identity?

This subject matter will draw from larger conversations about adaptive reuse, historic preservation (or rehabilitation), and sustainable practices. The scope of this thesis will be largely focused on the city of Pittsburgh.

Thesis

If a building is rendered vacant and underutilized, adaptive reuse can be a valuable alternative to demolition and reconstruction. And when adaptive reuse is the implicit choice, certain buildings are better suited for particular new purposes given its original program and resultant construction. Are warehouses particularly suited to be rehabilitated as cultural centers? Are banks most easily rehabilitated as commercial space?

I believe that buildings have embedded opportunities for adaptive reuse. And I also believe there are specific, quantifiable advantages to adapting particular buildings based on typology and program. My goal is to ultimately clarify the best type-to-type relationships, based on the cost of updating systems and spaces. By categorically laying out the advantages and disadvantages of converting types of buildings, we can determine how some building types are particularly suited to be reused as other building types.



Methods

My goal is to create a building matrix of construction methods for the city of Pittsburgh, in order to identify common vulnerabilities, common problems, and ultimately, efficient solutions to improve the longevity and continued use of existing architecture. My intention is to take this Pittsburgh building matrix, and use it as a roadmap for adaptive reuse opportunities within the city. In conjunction, I will use this research to identify how certain types of Pittsburgh buildings, if rendered no longer useful or vacated, are particularly suited for reuse as certain other building types. This will require research on the larger topics of adaptive reuse, in conjunction with the study of precedent rehabilitation projects. The building matrix will be a documentation balancing detail drawings, cost analysis, system diagrams, and potentially hand-made models.

The output of this compiled building matrix will also be a digital resource, potentially a website, which compiles the thesis research into a useful tool for Pittsburgh residents. The product should be able to show how key improvements or adaptations can affect the longevity of a building by giving it new purpose and improving its efficiency. It must also bring to light the economics and cost analysis of these conversions in the short term and long term. This digital resource must therefore have a strong emphasis on effective communication design.

Precedents

As part of my research, I will be examining precedent adaptive reuse projects to illuminate moments of success and failure when buildings are converted in particular ways (i.e. church to restaurant, school to apartment building).

Locomotive Lofts- Pittsburgh, PA
South Hills Retirement Residence- Pittsburgh, PA
Church Brew Works- Pittsburgh, PA
City of Pittsburgh Police Headquarters- Pittsburgh, PA
Century Building- Pittsburgh, PA
The Bruno Building- Pittsburgh, PA
Senator John Heinz Regional History Center- Pittsburgh, PA
The High Line- New York City, NY
Chelsea Market- New York City, NY
Selexyz Domintcanen (Bookstore)- Maastricht, Netherlands
*I mention this building because I was able to visit the site this past summer

Adaptive Reuse: Finding Opportunities for Vacant Structures. List of Projects.
http://adaptivereuse.info/case-studies/

Schedule

September:
Identify key Pittsburgh construction methods, eras, styles, etc.
October:
Identify major vulnerabilities through surveys and interviews, key solutions
November-December:
Illustrate construction methods, vulnerabilities, and solutions through annotated drawings, diagrams for comparative study
January-February-March:
Develop key building typologies' correlation with key adaptive reuse opportunities, in conjunction with the first semester's research into
construction methods, vulnerabilities, and solutions
April-May: Create digital resource

Annotated Bibliography

Books

Rabun, J. Stanley. *Building Evaluation for Adaptive Reuse and Preservation*. Wiley. 2009
"Professional guide to evaluating structural and material integrity of existing buildings"

Powell, Kenneth. *Architecture Reborn: Converting Old Buildings for New Uses*. Rizzoli. 1999
"A detailed investigation into the adaptation and conversion of existing buildings as a distinctive type of architectural design"

Brand, Stewart. *How Buildings Learn: What Happens After They're Built*. Penguin Books. 1995
"Synthesis that proposes that buildings adapt best when constantly refined and reshaped by their occupants, and that architects can mature from being artists of space to becoming artists of time"

Hamin, Elisabeth. *Preserving and Enhancing Communities: A Guide for Citizens, Planners, and Policymakers*. Univ. of Massachusetts Press. 2007
"This book starts from the premise that each community chooses its future every day, through the incremental decisions made by planning and zoning boards and other citizen volunteers, as well as professional staff. The challenge is to ensure that these decisions support the preservation of what is special about the community, while still fostering necessary and appropriate growth."

Bloszies, Charles. *Old Buildings, New Designs*. Princeton Architectural Press. 2011
"An Architecture Brief devoted to working within a given architectural fabric from the technical issues that arise from aging construction to the controversy generated by the various project stakeholders to the unique aesthetic possibilities created through the juxtaposition of old and new"

Feireiss & Klanten. *Build On: Converted Architecture and Transformed Buildings*. Gestalten. 2009
"Collection of phenomenal architectural transformations that bring new life and function to existing structures"

Uffelen, Van Chris. *Re-Use Architecture*. Braun Publish. 2010
"Buildings are therefore emerging with layers superimposed on top of one another: the original function usually still provides the scale and structure, into which a new matrix of utilization is installed"

Thiebaut, Pierre. *Old Buildings Looking for New Use: 64 Examples from Europe*. Edition Axel Menges. 2007
"The examples presented in this book all demonstrate a desire to be considered as local projects and to take their place in an evolutionary interpretation of history"

Online Resources

National Trust for Historic Preservation:
The Greenest Building: Quantifying the Environmental Value of Building Reuse
http://www.preservationnation.org/information-center/sustainable-communities/green-lab/valuing-building-reuse.html
"when comparing buildings of equivalent size and function, building reuse almost always offers environmental savings over demolition and new construction."

Building Green.com

1) Case studies of Pittsburgh adaptive reuse (including CCI Center, Glass Center)

http://www.buildinggreen.com/hpb/overview.cfm?projectId=240

2) Historic Preservation and Green Building: A Lasting Relationship http://www.buildinggreen.com/auth/article.cfm/2007/1/2/Historic-Preservation-and-Green-Building-A-Lasting-Relationship/
3) Future-Proofing Your Building: Designing for Flexibility and Adaptive Reuse http://www.buildinggreen.com/auth/article.cfm/2003/2/1/Future-Proofing-Your-Building-Designing-for-Flexibility-and-Adaptive-Reuse/
4) Retrofits (Usually) Greener Than New Construction, Study Says http://www.buildinggreen.com/auth/article.cfm/2012/1/24/Retrofit-Usually-Greener-Than-New-Construction-Study-Says/

National Trust for Historic Preservation

1) Deep Energy Retrofits for Existing Buildings: National Trust for Historic Preservation http://www.preservationnation.org/information-center/sustainable-communities/green-lab/getting-to-50.html#.UiaB7TZQHTo
2) Greening Older and Historic Buildings *http://www.preservationnation.org/information-center/sustainable-communities/buildings/#.UiaCWjZQHTo*

Articles: General Adaptive Reuse

Kirk, Patricia L. "Recycling old warehouses." Urban Land 68, no. 1 (January 2009): 54-61. Avery Index to Architectural Periodicals, EBSCOhost (accessed September 3, 2013).

> 'Old warehouse districts in the United States are returning to work in 21st-century roles that celebrate their past while embracing the future.' Examples from Minneapolis, Cleveland, St. Louis, San Francisco, Dallas, St. Paul, Los Angeles, Pittsburgh, and in Canada, Vancouver, B.C.

Articles: Specific Pittsburgh Projects

Stern, Michael. *Pittsburgh forges ahead: brownfields are becoming the economic drivers of a postindustrial landscape*. Urban land 64, no. 6 (June 01, 2005), (accessed September 03, 2013).

> 'Large-scale land parcels, previously industrial sites, are giving rise to commercial, residential, recreational, and retail uses along the Monongahela River in Pittsburgh.' Examples include the mixed-use project Waterfront (formerly U.S. Steel Homestead Works), Summerset at Frick Park, a neotraditional residential neighborhood (formerly a slag heap), and the mixed-use community SouthSide Works (formerly the LTV steel mill).

Raskin, Laura. 2012. "What lies behind: a 100-year-old office building's quiet exterior conceals a chic affordable housing and mixed-use development, a first for Pittsburgh's downtown core: Century Building, Pittsburgh, Pennsylvania." Greensource: The Magazine Of Sustainable Design 7, no. 1: 48-51. Avery Index to Architectural Periodicals, EBSCOhost (accessed September 3, 2013).

> Conversion of 104-year old Century Building, by architects Koning Eizenberg Architecture and Moshier Studio (architect of record and energy consultant)

Mendelson, Abby. "The Library Center [Pittsburgh]." Carnegie Magazine 63, no. 8 (March 1997): 20. Avery Index to Architectural Periodicals, EBSCOhost (accessed September 3, 2013).

> Adaptive reuse of bank building into a public library. Architect: Damianos & Associates. Includes sidebar on the Library & Archives of the Historical Society of Western Pennsylvania in its new home at the John Heinz Pittsburgh Regional History Center

Freeman, Allen. "Jailhouse conversion: [Allegheny County Jail, Pittsburgh]." Preservation: The Magazine Of The National Trust For Historic Preservation 53, no. 1 (January 2001): 44-49. Avery Index to Architectural Periodicals, EBSCOhost (accessed September 3, 2013).

> Conversion of H. H. Richardson's 1888 Romanesque revival jail into a county courthouse. Architects: IKM.

Nyren, Ron. "Recycled religious buildings: new uses - ranging from a climbing center to a bookstore - transform historic houses of worship." Urban Land 68, no. 10: 50-54. Avery Index to Architectural Periodicals, EBSCOhost. 2009 (accessed September 3, 2013).