

Historic Preservation and Sustainability: A Wyoming Case Study of Lyle Murtha, A.I.A. and the
T-Square Building

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Sustainability is a buzz word in today's society, but its connection with historic preservation is too often overlooked or simply missed entirely. However, the two are inherently linked in numerous ways, as both sustainability and historic preservation work to create dynamic communities with a lasting harmony among people and the environment. To make the connection, it may be more helpful to think of preservation as *conservation*. Sustainable development, according to The United Nation's Brundtland Report of 1987, is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."¹ With the building and construction industry creating the largest force in environmental degradation in terms of land use and material extraction, historic preservation and reusing our existing buildings is becoming ever more important in our world for both current and future generations.

The sustainability movement employs a concept referred to as the *triple bottom line*, coined by John Elkington in 1998, which essentially focuses on three interrelated groups: people, environment, and economy.² When developing a sustainable plan for any type of entity, the well-being of these groups must be taken into consideration. In a variety of ways, historic preservation works toward the desired social equity, financial prosperity, and environmental sensibility that characterize the ideal, vibrant sustainable community. Preservationists have long been left out of the sustainability discussion, but in recent years, increasing attention has been given to the positive outcomes stemming from preserving the existing built environment.

Repurposing older buildings helps create greener, more livable, and healthier urban spaces—in other words, *sustainable* neighborhoods and communities. Exactly *how* does historic

¹ Jean Carroon, *Sustainable Preservation: Greening Existing Buildings* (Hoboken, NJ: John Wiley & Sons, Inc., 2010), 48.

² Carroon, *Sustainable Preservation*, 45.

preservation do this? Certain characteristics in the design of historic buildings play a large role in sustainability: proper siting of the building to allow for solar gain and natural lighting, operable windows for natural ventilation, thermal mass, smaller spaces (use of less energy), and adaptability. Buildings with these features were likely built before modern conveniences like electricity and air conditioning. However, reports from the Preservation Green Lab, a research lab founded by National Trust for Historic Preservation, show that even repurposing a building with an average energy performance (i.e. constructed mid-20th-century), in most cases, proves a healthier option both for the environment and the human population.³ In addition, older buildings are often located within neighborhoods, as opposed to a strip mall on the edge of town. Reusing these existing buildings rather than razing and building new contributes to the diversity as well as the “walkability” of that community, reducing carbon emissions due to fewer vehicles on the road. Sustainability refers not only to the ability of our environment to last but for our communities as well.

In addition to its environmental benefits, historic preservation serves as a vital component of social equity and the well-being of citizens in a community. Preservation develops a unique sense of place and continuity, whether in a dense urban neighborhood or a small town in rural America. It fosters a deeper connection to the culture and generations of the past as well as an appreciation and desire to care for one’s surroundings, specifically the built environment. Dwight Young describes preservation as a “perpetual partnership, which, if maintained unbroken, makes for orderly growth in life and appearance of our communities: the perpetual partnership among the past, present, and future.”⁴ The diversity and aesthetic provided and

³ Patrice Frey et al., *The Greenest Building: Quantifying the Environmental Value of Building Reuse* (Washington, D.C.: The National Trust for Historic Preservation, 2011), 72.

⁴ Dwight Young, “Why Preserve?” *The National Trust for Historic Preservation Information Series* No. 48 (1991): 3.

inspired by this partnership add to the quality of life for current citizens and for those to come. At the same time, it respects the craftsmanship and values of past generations.

Conservation and preservation efforts can only be maintained if economically viable and beneficial, which brings us to the third element of the triple bottom line. In his article, “Historic Preservation IS Smart Growth,” Donovan Rypkema argues twenty points for preservation as Smart Growth, a principle for development that is sensitive to the three categories of the triple bottom line: people, environment, and economy. Many of Rypkema’s arguments are specific to economic perks of reusing and reinvesting in older buildings. For example, an existing building has no need for new infrastructure (water lines, sewer lines, streets, curbs, gutters, etc.) and therefore cuts significant costs in comparison to new construction.⁵ Additionally, reinvesting in historic buildings revitalizes and increases the value of not only the immediate property but the nearby properties and investments as well.⁶ Other economic benefits of preservation include, but are not limited to, low rent for start-up small businesses (leading to job creation within the community), diversity in businesses and uses, rehabilitation costs largely staying local, as well as tax-generating assets for the community.⁷

The trend of adapting existing buildings for new uses is catching on with the people of Wyoming, especially small business owners, main street developers, entrepreneurs, property investors, and architects, to name a few. Lyle Murtha, A.I.A., principal architect at Stateline No. 7 Architects in Casper, WY, is an example of one of these forward-thinking Wyomingites. Throughout his career as an architect, Murtha has been working with historic buildings, designing renovation and rehabilitation projects that respect historic character but allow for

⁵ Donovan Rypkema, “Historic Preservation IS Smart Growth,” *The Quarterly Newsletter of Connecticut Main Street Center* 2, no. 3, (2002): 1.

⁶ *Ibid.*, 2.

⁷ *Ibid.*, 2-3.

modern updates and uses. Now, he is renovating a historic building for Stateline No. 7 Architect's office space and his own personal loft space.

T-Square Case Study

T-Square Building, Casper, WY⁸

Current Owner: T Square Land Company, Lyle Murtha

Building Type: Professional Office/ Loft

Original Building Construction: 1917 with later additions

Restoration/Renovation: Underway-Summer 2013 predicted completion of first phase

Square Footage: 18,000

Percentage Renovated: 100 percent

Cost: \$0.5 Million



Figure 1. Façade of T-Square Building. Stateline No.7 Architects, 2012.

⁸

See Figure 1.

Project Description

The current renovation of the T-Square Building in downtown Casper at 444 S. Center Street and 120 W. Collins has revitalized a large building that stood unused for nearly ten years. Lyle Murtha, A.I.A., principal architect at Stateline No. 7 Architects, and owner of T Square Land Company bought the old Casper Supply warehouse in the spring of 2011, and the Stateline crew has gradually restored the exterior and renovated the interior space, completing much of the work themselves. The exterior rehabilitation required tedious work of removing of layers of paint as well as window replacement and re-roofing. The interior also required removing paint layers, taking the wall surfaces back to the exposed brick, as well as a gut-and-remodel to create an open floor plan reception and office in addition to loft space in the back half of the building. Murtha kept to the warehouse theme throughout the entire building, paying homage to its original use as a warehouse along the railroad. Phase I of this project is focused on completing the office space and one loft unit, which Murtha himself will occupy. The next phases will include further renovation, creating more residential units as well as retail or office spaces for lease.

Exterior Envelope/Historic Preservation

The renovation included a careful and tedious process of removing layers of paint to restore the exterior brick of the building. Murtha consulted a historic preservationist prior to applying any treatments to the exterior. A special application was used to remove the paint, which slowly peeled off the pink and green layers to reveal the original red brick of the warehouse. In addition to the layers of paint, multiple awnings and signs, added years after the building's construction, were removed. The removal further restored and brought back to view

the 1930s art deco characteristics, specifically the fluted concrete molding of the entryway on the façade with the original Casper Supply engraving.

Energy

The firm's mechanical engineer ran the energy loads prior to the project, and the team discussed different ways to increase the energy efficiency of the building through roof insulation, window shading, and more efficient windows. According to Murtha, the key factor in the energy load of the building was the minimal or nearly non-existent roof insulation, which is rarely the governing factor in most buildings. They decided to replace the roofing membrane with a material called Fibertite, opting for the gray color, which boasts a solar reflectance index above 90%. The old furnaces were replaced with new, high efficiency residential furnaces, which operate at 90% efficiency compared to the 80% efficiency of standard residential furnaces. Prior to the project, all of the windows were single-pane with no thermal break. The firm chose to replace the old windows with new, double pane windows with thermal breaks that closely resemble the look of the steel frame windows of the building's time period. The glass in the high efficiency windows has a U-factor of 0.27 with a solar heat gain coefficient of 0.4, which puts them well below the prescriptive values of 0.36 and 0.43, respectively.⁹

Materials: Reduced/Re-Used/Recycled

In keeping with the warehouse style, the renovation draws much of its sustainable practice from its significant reduction in materials used. Electrical and mechanical systems are exposed throughout the interior of the building as well as the structural elements, including original heavy timber posts in the reception area, beams, roof trusses, and the load-bearing masonry walls. In addition, the open plan of the renovation called for few materials for new walls, and the design incorporated much of the existing structure, reducing the need for materials

⁹ Lyle Murtha, e-mail message to author, April 19, 2013.

even further.¹⁰ A lofted space in the front of the building has been re-used for new work space for the designers, retaining the staircase and original wood flooring found underneath more modern layers.¹¹ Plywood used on the exterior of the building to cover the windows during the early stages of the project was re-used for the walls and divisions that were implemented in the design, creating individual spaces for employees of Stateline No. 7 Architects. One of the new materials used in the project is a recycled and compressed paper product made into countertop, which will be installed in the restrooms. Additionally, of the materials removed in the interior demolition, approximately 60%-70% were salvaged rather than discarded. Lastly, one cannot overlook the re-use of an existing building, avoiding vast economic and environmental costs of new construction.



¹⁰ See Figure 2.

¹¹ See Figure 3.

Figure 2. Front reception area for Stateline No. 7 Architects near the end of renovation. Schmidt, March 2013.



Figure 3. Lofted workspace for Stateline No. 7 Architects with original wood flooring. Schmidt, March 2013.

Passive Survivability Features

Many passive survivability designs, meaning the ability to function if modern conveniences like electricity were to become unavailable, throughout the building contribute to its sustainability and energy use reduction as well. The large windows on the façade and side elevations of the building and numerous clerestory windows allow for an abundance of natural light throughout the building. Additionally, the open floor plan and borrowed lighting techniques multiply the benefits of incoming natural light. All of the new windows are operable, including those on the façade, providing natural ventilation to improve the interior air quality. Lastly, the thermal mass of the exterior brick walls contributes to the even temperature of the building throughout the day as well as reducing energy costs in heating and cooling.

Sustainability

The project has incorporated many green elements of the triple bottom line (people, environment, economy), simply starting with the use of an existing building in a dense, downtown location of Casper. The site location offers employees, tenants, and patrons alike the opportunity to walk to and from the building within the business district as well as from nearby neighborhoods. This contributes to all three elements of sustainability by providing accessibility for people, attracting more people (and money) to downtown businesses, and reducing the need to drive to the site. Another aspect of social sustainability, stemming from the re-use of the building, is the fact that there is no longer an empty building in the heart of the city, which more than likely had an effect on the atmosphere and the aesthetic appeal of downtown Casper. For the employees of Stateline No. 7, the building offers them not only more room but creative space for their work, being surrounded by a meshing of historic and innovative designs. Murtha, who will take up residence in the loft space of the building, no longer needs to drive to work or to other downtown businesses, contributing to his quality of life in addition to the well-being of the environment.

Many other factors contribute to the environmental sustainability aspect of this project. The reuse of an existing building as well as the reduced amount of materials in the design avoid the environmental impacts that new construction causes in both the production and transportation phases. The reuse and recycling of the materials taken out of the building also reduced the amount of waste going to the landfill. The central location of the building allows for less driving for employees and clients who choose to walk, ride bike, or use another form of alternative transportation, lowering carbon emissions in the process.

From an economic standpoint, the T-Square project was an affordable investment for Murtha and his architectural firm, costing around \$500,000. In return, the firm can anticipate

increased profits with its prime location and a building that portrays the talents of its designers, engineers, and other staff members. As the next phases of the project are completed, the building will provide more mixed-use space—residential lofts, small-businesses, and/or non-profits. This will contribute economically to Murtha’s T Square Land Company as well as small start-up businesses or organizations in Casper. Additionally, the revitalized building will stand as an example for other property owners, or those looking into buying property in downtown Casper, of what can be done to the existing building stock. A domino effect could increase the economic status of the whole business district by attracting more people to the downtown for shopping, living, eating, etc. One example of this is found in the County Annex building, which has been purchased and will be turned into lofts for downtown residential space.

An Architect’s Career

Lyle Murtha, the youngest of twelve children, grew up on a farm a few miles west of Parkston, South Dakota, a small agricultural community in the southeastern region of the state. Historic buildings, although not registered on any official lists, were part of everyday life for Murtha. The family farmhouse, the same in which his grandparents raised their own twelve children, including his father Bill, was an early twentieth-century, two-and-a-half story, red-brick home. Even today, little has changed about the house aside from repairs from a fire and a few minor updates over the years. It, along with the other buildings of the farmstead—barns and sheds dating back to before his father’s childhood years, played a role in shaping Murtha’s interests and character.

From his earliest days on the farm, Murtha eventually transitioned into his school days spent in buildings from the first decades of the twentieth century, a time when architects designed schools to portray the importance of education in the community. The three different school buildings in which Murtha received his primary and secondary education (Sacred Heart

parochial school in Parkston built in 1914, an elementary school in Dimock built in 1913, and the Parkston High School built in 1923) surrounded him with an environment that sparked a deep sense of appreciation for such historic buildings as well as for the generations that crafted them.¹² In regard to this element of his upbringing and its influence, Murtha modestly remarked, “I guess you’re just born into something like that.”¹³ While fate may have played a role, his own keen awareness of his surroundings likely fostered what became a lifelong passion as well.

After graduating from Parkston High School in 1987, Murtha went on to South Dakota State University (SDSU) in Brookings for a year before transferring to the University of Nebraska-Lincoln (UNL) to study architecture, a program of study not yet offered at SDSU. At both campuses, Murtha observed the built environment and its mix of buildings, both historic and modern, as a coexistence that simply made sense. The new and old worked together as the campuses continually evolved and expanded, maintaining the diversity that remains a key component of successful, sustainable spaces today. The meshing of new and old buildings was, for Murtha, the way built environments should be, reflecting a natural growth that still respects older generations.

Upon graduating from UNL in 1992 with a B.S. in Architectural Studies, Murtha started working for Ohnstad Architects in Sioux Falls, SD as a designer. After gaining experience there, he spent a two years working in Rapid City, SD for Lund Associates as a designer and illustrator before moving to Casper, WY in 1995. Here he took on more responsibility as designer, project manager, and construction administrator for Gorder-South Group and later for Amundsen Associates, adding office managing, illustration, and marketing to his professional roles. While

¹² Parkston Area Historical Society, *Pictorial History of Parkston* (Parkston, SD: Parkston Area Historical Society, 2006), 102-136.

¹³ Lyle Murtha, interview with author, March 19, 2013.

at Amundsen Associates, Murtha designed what he considers his first “green” project for Mobile Concrete in Casper.

The USGBC (U.S. Green Building Council) was just launching its LEED program when the Mobile Concrete project reached completion in 2000. Nonetheless, Art Boatright, owner of Mobile Concrete, desired to incorporate certain “green” features even though the green building movement had not yet risen to its current status as a widespread, popular concept. The project included a ground-source geothermal HVAC system, high volume fly ash concrete, and the re-use of historic lattice columns and trusses salvaged from a warehouse building demolished near the Casper airport years prior. In addition to these features, the site, large windows, and open floor plan allow for an abundance of natural daylight throughout the building. Working with Boatright for the Mobile Concrete building was Murtha’s first experience with a client interested in re-using materials and energy efficiency, and still today, these are not common interests in Casper, a city whose economy has long depended on oil booms and energy development.

A move back to the Black Hills to join Williams and Associates Architecture, Inc. in Spearfish, SD marked the beginning of Murtha’s extensive experience in working with historic buildings. His first historic projects included studies of two ranches near Spearfish in 2002, the Anderson Dairy Ranch and the Frawley Ranch. For the Anderson Dairy Ranch, a National Historic Landmark, Murtha managed a team of architects and engineers in compiling a National Historic Landmark Condition Assessment. This assessment reported the existing condition of the ranch, which included several buildings, and also gave recommendations and cost estimates for repairs needed to preserve the site. The study of the ranch required Murtha to work closely with the Secretary of the Interior’s Standards for the Treatment of Historic Properties, giving him

valuable experience that would benefit him in future historic projects. The recommendations for preservation are still being carried out today.¹⁴

The Frawley Ranch, also listed on the National Register of Historic Landmarks, is a working ranch outside of Spearfish that sought Murtha's expertise to evaluate and make recommendations for the buildings on the property. The owner desired to make repairs and convert some portions of the building into living museum spaces where visitors could watch hand-crafted works in the making. Like the Anderson Dairy Ranch, the results of Murtha's study of Frawley Ranch continue to be implemented today. On this same property, Murtha, working with civil engineers and landscape architects, designed the Elkhorn Ridge Campground buildings, all which met the South Dakota State Historic Preservation Office's guidelines for new construction on a listed property. Using appropriate forms, materials, and layouts, the designs of the new buildings draw harmonious connections to the historic ranch.¹⁵

While still in Spearfish, Murtha headed up another notable historic project, this time for the Adams Museum, a building listed on the National Register of Historic Places in downtown Deadwood, the town itself being a National Historic Landmark. The project included renovations for ADA accommodations (elevator and ramp), a basement egress stair, a fire protection system, thermal/energy efficiency, historic exterior concrete repairs, exterior tuckpointing, subgrade waterproofing, rooftop speakers/public address system, and a below grade basement addition among other smaller projects. Murtha's designs met the requirements of the three entities involved in the renovation—the City of Deadwood (building owner), the Deadwood Historic Preservation Commission (funding), and the Adams Museum Board (facility

¹⁴ Stateline No. 7 Architects. <http://stateline7.com/Staff/Lyle's%20Resume/AndersonDairy2.html>.

¹⁵ Stateline No. 7 Architects. <http://stateline7.com/Staff/Lyle's%20Resume/ElkhornRidge.html>.

operator)—as well as those of the South Dakota State Historic Preservation Office. This project, carried out in phases around the historic artifacts of the museum, was completed in 2005.¹⁶

That same year, Murtha made the decision to start his own firm, Stateline No. 7 Architects, in Casper, WY, turning down a partnership offer at Williams and Associates Architecture, Inc. to do so. Eight years later, the firm is making a move into its own building, the T Square Building, a sign of its success in the community and region. Murtha, having built up a following while working in the Black Hills, continues to receive requests from clients in the Black Hills who seek out his talents and the talents of his staff. Many of the historic renovation projects Murtha has designed since moving back to Casper have been in the Black Hills: the Windsor Block Lofts in downtown Rapid City, the Homestake Adams Research and Cultural Center (HARCC) in Deadwood, various rehabilitation projects at the South Dakota Veterans Home in Hot Springs, the Knights of Columbus building remodel in Rapid City, and the Elks Lodge remodel, also in Rapid City. Other historic projects across Wyoming Murtha and his team have been a part of include the construction of new buildings at the Ten Sleep Fish Hatchery (working with the Wyoming Game and Fish, the National Forest Service, and the Wyoming State Historic Preservation Office) in Ten Sleep, repurposing a 1930s farm implement repair shop for the Pine Bluffs Day Care, JS Brown Lofts in Casper, the firm's own T-Square project in Casper, and the County Annex Lofts in Casper, a new project currently underway.

With each historic renovation or rehabilitation, Murtha hopes to contribute a small piece of education and inspiration for the people of Wyoming and/or South Dakota. For him, these projects not only save a physical structure and prevent negative environmental impacts, but they work to preserve an intangible element as well. “There’s value beyond money in these

¹⁶ Stateline No. 7 Architects. <http://stateline7.com/Staff/Lyle's%20Resume/Adams.html>.

buildings. There is character that you cannot build in new construction,” Murtha remarked.¹⁷ While Stateline No. 7 continues to take on a variety of projects, including many with new construction, he hopes to reverse a trend he has witnessed too often in Casper. When first moving to the small city in 1999, Murtha made note of his ten favorite buildings, and today, every one of those has been torn down. Conveying the cultural importance or character of these buildings can be difficult in a society that is constantly upgrading. However, with more examples of affordable, eco- and human-friendly adaptive re-use projects, the campaign for preservation as sustainable in all three aspects of the concept will spread to conservationists, investors, and community-minded people alike. Growing this type of mindset and awareness, as Murtha aims to do, will result in the diverse neighborhoods and cities needed for creating a harmony among the human population, our built environment, and the earth.

¹⁷ Lyle Murtha, interview with author, March 19, 2013.

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