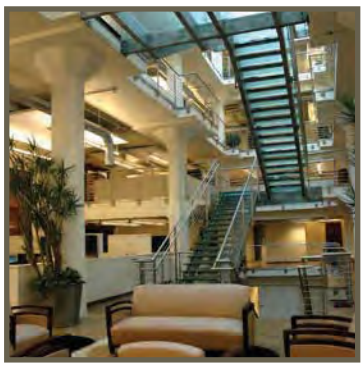
PROFITS THROUGH PRESERVATION

The Economic Impact of Historic Preservation in Utah

TECHNICAL REPORT

Jobs and Income
Heritage Tourism
Property Values
Sustainability
Downtown Revitalization
Fiscal Responsibility



UTAH HERITAGE FOUNDATION

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EXECUTIVE SUMMARY

Historic preservation in Utah is not about putting a fence around monuments. The historic resources of Utah are part of the daily lives of its citizens. However, the historic resources of Utah are also providing a broad, significant contribution to the economic health of this state.

JOBS AND INCOME

Rehabilitating a historic building in Utah reclaims an asset and is also a powerful act of economic development that creates jobs, household income, and property value.

Because of the labor intensity of rehabilitation and the relatively high wages for workers, very few industries create more jobs and household income for Utah workers per $1 million of economic activity than historic preservation.

$1,000,000 INVESTED IN REHABILITATING A HISTORIC BUILDING IN UTAH MEANS:	
Direct Jobs	10.2
Indirect Jobs	7.5
Direct Salary & Wages	$536,894
Indirect Salary & Wages	$310,660
Economic Activity Elsewhere in the Economy	$998,772
Indirect Business Tax	$12,127
State Sales Tax	$22,090

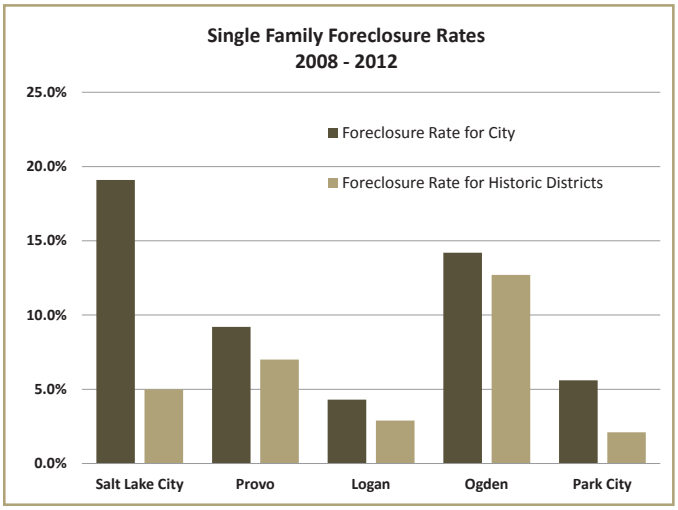
HERITAGE TOURISM

In some states, “heritage tourism” is a discrete set of activities. In Utah, heritage is incorporated in a wide range of visitor experiences. The 4 million people who visit Temple Square each year come for religious, business, or genealogical reasons, but they are visiting a National Historic Landmark. The 500,000 movie-goers who attend the Sundance Film Festival do so in one of the great historic towns in the West. Nearly 5.5 million visitors travel to Bryce Canyon and Zion national parks for their incredible scenery and unique geology, but they get there by traveling through the Mormon Pioneer Heritage Area, one of 49 National Heritage Areas in the country.

For this study, only the visitation to 62 heritage sites and events were measured. Even so, that represented over 7.2 million visitors with direct expenditures of nearly $400 million.

PROPERTY VALUES – IN GOOD TIMES AND BAD

Utah citizens appreciate their built heritage, and many of them choose to live in landmark buildings and historic districts. They choose these houses for many reasons — quality of construction, architectural character, convenience of the neighborhood, and others. And the admiration they hold for historic houses is repaid with higher rates of appreciation in value. National and local historic districts were analyzed in five cities: Logan, Ogden, Park City, Provo, and Salt Lake City. In every instance, the rates of appreciation of homes in historic districts were greater than those in the city as a whole.



When everyone’s property is going up in value, perhaps a percentage point or two in higher annual appreciation rates isn’t surprising. But what happens to historic houses in times of declining property values? Foreclosure rates over the last five years of real estate chaos were examined in those same five cities.

Both homeowners and their bankers should be happy the decision was made to live in a historic district. In each city, the rate of foreclosure of single family houses in historic districts was lower than that in the city as a whole.

SUSTAINABILITY

The 19th century pioneers who settled in Utah were good stewards because they had to be. Neither land nor resources could be wasted, so when they built buildings, those buildings were built to last. And many of them are still standing today. In the 21st century Utahns are good stewards because they have learned to be. From the restoration of the Tabernacle in Provo to a new roof on a bungalow in the Avenues to the pioneer courthouse in St. George, institutions, governments and individuals are reinvesting in the resources of yesterday for use tomorrow. They are doing so for economic reasons, but also for environmental reasons. In Utah, building an identical house in another location or demolishing and replicating a house on the existing site would mean 4 to 7 times more materials produced, transported and disposed of than rehabilitating an existing historic house in its current location. Historic preservation has appropriately been called the ultimate in recycling.

DOWNTOWN REVITALIZATION

Not so long ago, downtowns were written off as a relic of the past. But many Utah towns and cities decided that the historic built environment of the past could be brought back to life, and that downtown could reclaim its rightful place as the heart of the community. In almost every example of successful, sustained downtown revitalization in Utah, the rehabilitation and reuse of historic buildings has been a key component.

Historic downtowns provide a natural incubator for local entrepreneurs. These businesses are central to local economic stability. Historic downtowns communicate the identity of the community. Focusing on historic downtowns provides the means for effectively and efficiently managing growth in a fiscally responsible manner.

FISCAL RESPONSIBILITY

Fiscal responsibility means being prudent with taxpayers' dollars. That is exactly what the Utah State Historic Preservation Tax Credit program does. Since it was adopted by the Legislature in 1994, over 1,100 projects have used this credit as the catalyst for more than $119 million of private-sector investment. Every dollar of state tax credit generates a minimum of $4 of private investment. This has resulted in stabilized neighborhoods, revitalized downtowns, sales taxes, property taxes, income taxes, and infrastructure savings — not just restored historic buildings.

▲ *before*

▼ *after*

The Federal Historic Rehabilitation Tax Credit has also been used on projects throughout the state. Since 1990, this credit has kept more than $35 million in Utah, creating jobs and income here, instead of leaving the state for Washington to invest elsewhere.

BY THE NUMBERS

HISTORIC PRESERVATION IN UTAH

$717,811,000 Direct and indirect spending by visitors to Utah heritage sites and special events. *

$198,379,272 Salaries and wages paid as a result of historic preservation projects using Federal or State Historic Rehabilitation Tax Credits. ⊠

$177,276,340 Amount of private investment in historic buildings using the Federal Historic Rehabilitation Tax Credit. ⊠

$119,273,302 Amount of private investment in historic buildings using the Utah State Historic Preservation Tax Credit. #

$35,455,268 Investment that stayed in Utah rather than sent to Washington because of the Federal Historic Rehabilitation Tax Credit. ⊠

7,300,000 Number of visitors to Utah heritage sites and special events each year. *

$4,374,000 Additional statewide annual property tax revenues from investment in historic preservation projects. *

7,313 Direct and indirect jobs generated by the heritage portion of Utah's tourism industry. *

4,969 Jobs from historic preservation projects using Federal or State Historic Tax Credits. ⊠

2,470 Housing units rehabilitated using the State Historic Tax Credit. #

1,128 Number of projects using the State Historic Tax Credit. #

350 Tons of raw and waste materials generated when an older house is demolished and replaced with a new one. Rehabilitating the same older house generates *only 50 tons* of materials.

100% Cities where foreclosure rate was lower in historic districts than the rest of the city.

68 Average "Walk Score" for historic preservation projects in Salt Lake City, as compared to an overall city score of 58.

33% Increase in downtown sales volume in Mt. Pleasant in the decade after it became a Main Street community. ^

15% Tourists in Utah who visited a historic site during their stay. *

* Annual ⊠ Aggregate 1990-2012 # Aggregate 1993-2012 ^ Aggregate 1997-2012

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INTRODUCTION

Utah is well known for having one of the strongest, most stable economies in the country. There are multiple reasons for this: a well-educated workforce, economic diversity, fiscally responsible state and local governments, and substantial year-in, year-out production from the agriculture, natural resources, high-tech, and tourism sectors.

Utahns are rightfully proud of their state's economy.

They are also proud of the depth and breadth of the heritage resources found throughout the state's 29 counties. Temple Square in Salt Lake City, the vibrant business district on 25th Street in Ogden, the Stagecoach Inn at Camp Floyd, and the Jens Nielson House in Bluff may not seem to have much in common. Some are owned by an institution, some by the private sector, and some by government. Some are grand in scale; some are modest. But they have one thing in common: each is a physical representation of the history of Utah.

But "economy" and "historic preservation" do not often appear in the same sentence. The citizens of Utah have been good stewards of historic buildings for their cultural, aesthetic, social, symbolic, religious, and educational values. And that is as it should be. Those "values" of the built heritage may well be beyond measure.

However, some of the values of historic preservation can be measured, and those are the economic ones. This report looks at the quantitative impact of historic preservation in six areas: jobs and income, sustainability, downtown revitalization, heritage tourism, property values, and fiscal responsibility.

The results are clear: preservation creates jobs and income to support local communities and the state economy. It helps increase environmental sustainability by reducing waste, improving energy efficiency, and reducing development sprawl pressures. It brings new life to downtowns and attracts tourists from around the U.S. and the world to spend money in local communities. It boosts and stabilizes property values. And it is a key part of fiscal responsibility.

This study was commissioned by the Utah Heritage Foundation, which exists to preserve, protect, and promote Utah's historic built environment through public awareness, advocacy, and active preservation. This report is aligned with the organization's work across the board. It quantifies some of the impacts of active preservation efforts, and raises public awareness of preservation as an effective tool for economic growth. It provides substantial support for preservation advocacy. In short, it shows that preserving, protecting, and promoting Utah's built heritage all pay off richly in the state's economy, giving Utahns something else to be proud of.

JOBS AND INCOME

Ask anyone who is in the business of economic development what ultimately is the most important measure, and the answer will be the same—jobs. It is no accident that Utah gauges its economic success in part by having one of the lowest unemployment rates in the nation.

Every day, Utah citizens, governments, and institutions are assuring a future for their historic buildings by investing in, maintaining, and rehabilitating them. While not all of this economic activity can be reliably tracked, a sizable amount can be measured. Specifically, a substantial amount of data exists on the investment in historic buildings by property owners who use the Federal Historic Rehabilitation Tax Credit and the Utah Historic Preservation Tax Credit. Over the 23-year period between 1990 and 2012, nearly $300 million in private capital was invested in historic buildings using one of these two programs.

Table 1

PRIVATE INVESTMENT IN HISTORIC BUILDINGS USING TAX CREDITS 1990 – 2012			
	FEDERAL	STATE	TOTAL
Projects	109	1,128	1,237
Investment	$177,276,310	$119,273,302	$296,549,642

* A few projects used both credits

These two tax credit programs are explained below.

While a large number, the $300 million represents only a fraction of the historic preservation work that is taking place in Utah. Since the tax credits are only useful to taxpaying entities, investment made by state and local governments, as well as institutions such as The Church of Jesus Christ of Latter-day Saints (LDS Church) and the University of Utah, are not reflected in these expenditures. Nor are the millions spent annually by individual property owners who either cannot or do not choose to use the tax credits. Even so, the economic impact of tax credit investment is impressive.

PRESERVATION TAX INCENTIVES

Historic buildings are tangible links with the past. They help give a community a sense of identity, stability and orientation. Preservation tax credits recognize the benefits of historic buildings by providing incentives to rehabilitate them.

A tax credit differs from an income tax deduction. An income tax deduction lowers the amount of income subject to taxation. A tax credit, however, lowers the amount of tax owed. In general, a dollar of tax credit reduces the amount of income tax owed by one dollar.

Federal Historic Rehabilitation Tax Credit

The Federal government encourages the preservation of historic buildings through various means. One of these is the program of Federal tax incentives to support the rehabilitation of historic and older buildings. The Federal Historic Preservation Tax Incentives program is one of the Federal government's most successful and cost-effective community revitalization programs.

The National Park Service administers the program with the Internal Revenue Service in partnership with State Historic Preservation Offices. The tax incentives promote the rehabilitation of historic structures of every period, size, style and type.

The 20% Federal Historic Rehabilitation Tax Credit is jointly administered by the U.S. Department of the Interior and the Department of the Treasury. The National Park Service (NPS) acts on behalf of the Secretary of the Interior, in partnership with the State Historic Preservation Officer (SHPO) in each state. The Internal Revenue Service (IRS) acts on behalf of the Secretary of the Treasury. Certification requests (requests for approval for a taxpayer to receive these benefits) are made to the NPS through the appropriate SHPO. Comments by the SHPO on certification requests are fully considered by the NPS. However, approval of projects undertaken for the 20% tax credit is conveyed only in writing by duly authorized officials of the National Park Service.

The 20% tax credit applies to any project that the Secretary of the Interior designates a certified rehabilitation of a certified historic structure. The 20% credit is available for properties rehabilitated for commercial, industrial, agricultural, or rental residential purposes. It is not available for properties used exclusively as the owner's private residence.

What is a "certified historic structure?"

A certified historic structure is a building that is listed individually in the National Register of Historic Places — OR— a building that is located in a registered historic district and certified by the National Park Service as contributing to the historic significance of that district. The "structure" must be a building—not a bridge, ship, railroad car, or dam. A registered historic district is any district listed in the National Register of Historic Places.

A State or local historic district may also qualify as a registered historic district if the district and the enabling statute are certified by the Secretary of the Interior.

What is a "certified rehabilitation?"

The National Park Service must approve, or "certify," all rehabilitation projects seeking the 20% rehabilitation tax credit. A certified rehabilitation is a rehabilitation of a certified historic structure that is approved by the NPS as being consistent with the historic character of the property and, where applicable, the district in which it is located. The NPS assumes that some alteration of the historic building will occur to provide for an efficient use. However, the project must not damage, destroy, or cover materials or features, whether interior or exterior, that help define the building's historic character.

(Above information from the National Park Service, U.S. Department of the Interior)

Utah Historic Preservation Tax Credit

A 20% nonrefundable tax credit (not a deduction) for the rehabilitation of historic buildings occupied by owners or used as residential rentals is also available. Through the program, a property owner can deduct 20% of all qualified rehabilitation costs from personal Utah income or corporate franchise taxes.

As an example, $22,000 in qualified rehabilitation cost will yield a $4,400 state income tax credit.

Does my building qualify?

Any building listed in the National Register of Historic Places qualifies if it is used as a residence (owner-occupied or rental) after rehabilitation. The credit cannot be taken for any property used for commercial purposes, including hotels and bed-and-breakfasts. If the historic B&B is also owner-occupied, the owner-occupied portion of the rehabilitation may qualify.

The building does not need to be listed in the National Register at the beginning of the project, but a complete National Register nomination must be submitted when the project is finished. The property must be listed in the National Register within three years of the approval of the completed project.

Utah SHPO staff can evaluate the eligibility of a building and provide instructions on nomination requirements.

What rehabilitation work qualifies?

Interior and/or exterior repair, rehabilitation, and restoration all qualify for the state tax credits. Work may include historic, decorative, and structural elements, as well as mechanical systems. All proposed, ongoing, or completed work must meet the Secretary of the Interior's Standards for Rehabilitation and be approved by the SHPO.

Depending on the building conditions and the specifics of the proposed project, some examples of eligible work items include:

- Repairing/upgrading windows
- Plumbing repairs and fixtures
- Refinishing floors, handrails, etc.
- Repairing or replacing roofs
- Compatible new kitchens and baths
- Reversing incompatible remodels
- Painting walls, trim, etc.
- Repointing masonry
- Reconstructing historic porches
- New furnace, A/C, boiler, etc.
- New floor and wall coverings
- Electrical upgrades
- Architectural, engineering, and permit fees

The purchase price of the building, site work (such as landscaping, sidewalks, fences, and driveways), new additions, work on outbuildings, and the purchase and installation of moveable furnishings or equipment (such as window coverings and refrigerators) do not qualify for the credit.

All work must meet the Secretary of the Interior's Standards for Rehabilitation. The tax credit cannot be taken on any portion of the work.

(Above information from the Utah State Historic Preservation Office)

JOBS AND INCOME FROM HISTORIC TAX CREDIT INVESTMENT

As noted above, the investment in Utah's historic buildings through the Federal and State tax credits has been nearly $300 million dollars. But the benefit to the state's economy does not stop with investment in those buildings. Jobs are created, and those jobs generate paychecks.

It is possible to calculate the number of jobs and the amount of income that investment generates, using the IMPLAN1 economic modeling system. Both jobs and income are calculated on a direct, indirect, and induced basis. A simplified explanation of those terms is as follows:

- A direct effect is a result of activity within the industry itself. If a carpenter is working on the historic rehabilitation project, her job and her paycheck are direct effects.
- An indirect effect is economic activity generated because the direct activity is taking place. The salesman at the lumberyard selling two-by-fours to the project has an indirect job and his paycheck is indirect income.
- Both the carpenter and the lumberyard salesman ultimately spend their paychecks. This creates additional economic activity (jobs and income) in the community, which are called induced effects.

For simplicity's sake, indirect effects and induced effects have been combined for this report.

As can be seen in the table below, Federal and State historic tax credit projects have meant nearly 5,000 jobs and $200 million in income over the past 30 years.

Table 2

	Federal	State	Combined
JOBS			
Direct	2,114	737	2,851
Indirect/Induced	1,539	580	2,118
Total	3,653	1,317	4,969
INCOME			
Direct	$93,039,882	$32,303,365	$125,343,247
Indirect/Induced	$53,835,258	$19,200,767	$73,036,025
Total	$146,875,140	$51,504,132	$198,379,272

Nearly 5,000 jobs and $200 million in income sounds like a lot. Still, a skeptic might say, "Those are numbers over 23 years! On an annual basis, it's just not that much." It is true that, since 1990, these projects have generated an average of just over 200 jobs and $8,500,000 in paychecks each year. But if that were a single business, it would be larger than 98.9 percent of all Utah firms.

[1] See Appendix E for fuller explanation of IMPLAN.

The jobs and income each year as a result of the Federal Historic Rehabilitation Tax Credit are found in the table below:

Table 3

FEDERAL TAX CREDIT PROJECTS							
YEAR	INVESTMENT	JOBS - DIRECT	JOBS – INDIRECT/ INDUCED	JOBS - TOTAL	INCOME - DIRECT	INCOME – INDIRECT/ INDUCED	INCOME - TOTAL
1990	$7,000,000	110.1	80.1	190.3	$3,448,768	$1,995,546	$5,444,314
1992	$252,364	3.9	2.8	6.7	$124,922	$72,283	$197,205
1993	$2,799,889	42.5	30.9	73.4	$1,392,483	$805,727	$2,198,210
1994	$747,611	11.1	8.1	19.3	$373,553	$216,147	$589,700
1995	$297,378	4.4	3.2	7.5	$149,281	$86,378	$235,658
1996	$381,486	5.5	4.0	9.5	$192,390	$111,322	$303,711
1997	$4,165,126	58.6	42.7	101.3	$2,110,233	$1,221,035	$3,331,268
1998	$3,401,808	47.0	34.2	81.1	$1,731,419	$1,001,843	$2,733,263
1999	$1,516,662	20.5	14.9	35.4	$775,465	$448,704	$1,224,169
2000	$29,016,277	384.5	279.7	664.2	$14,903,464	$8,623,526	$23,526,990
2001	$648,563	8.4	6.1	14.5	$334,627	$193,624	$528,251
2002	$2,198,000	27.9	20.3	48.2	$1,139,176	$659,156	$1,798,332
2003	$5,792,735	72.0	52.3	124.3	$3,015,729	$1,744,978	$4,760,706
2004	$16,719,173	203.1	147.7	350.8	$8,742,996	$5,058,921	$13,801,917
2005	$15,330,618	182.0	132.4	314.4	$8,052,550	$4,659,412	$12,711,962
2006	$14,315,250	166.0	120.7	286.7	$7,552,530	$4,370,087	$11,922,618
2007	$5,892,663	66.7	48.5	115.2	$3,122,601	$1,806,817	$4,929,418
2008	$6,237,402	68.9	50.1	119.0	$3,319,797	$1,920,920	$5,240,717
2009	$17,226,775	185.5	134.9	320.4	$9,208,872	$5,328,489	$14,537,361
2010	$11,603,305	121.8	88.6	210.3	$6,229,749	$3,604,692	$9,834,442
2011	$28,283,255	288.2	211.0	499.1	$15,250,936	$8,824,582	$24,075,518
2012	$3,450,000	35.2	25.6	60.7	$1,868,342	$1,081,070	$2,949,412
TOTAL	$177,276,340	2113.8	1538.7	3652.5	$93,039,882	$53,835,258	$146,875,140

A close examination of the numbers above will reveal that the relationship between the total investment and the numbers of jobs and the respective income changes from year to year. That is due to generally increasing overall building costs and wages and some degree of greater labor efficiency. Thus, there is a pattern of fewer total jobs but slightly more income per million dollars of investment from year to year. In other words, in 1990 there were a larger number of jobs per million dollars of investment than there were in 2012.

The table on the following page enumerates the investment, jobs, and income resulting from the use of the Utah Historic Preservation Tax Credit. If one adds the total jobs (and income) from the Federal tax credit to the total jobs (and income) from the Utah tax credit the result will be greater than the numbers indicated in Table 2. That is because some projects used both tax credits. The combined totals in Table 2 reflect that adjustment to avoid double counting and overstating the number of jobs and income.

Table 4

STATE TAX CREDIT PROJECTS							
YEAR	INVESTMENT	JOBS - DIRECT	JOBS – INDIRECT/ INDUCED	JOBS - TOTAL	INCOME - DIRECT	INCOME - INDIRECT/ INDUCED	INCOME - TOTAL
1993	$3,145,875	15.2	12.0	27.2	$1,650,220	$980,873	$2,631,092
1994	$1,689,212	14.8	11.6	26.5	$876,419	$520,934	$1,397,353
1995	$1,384,917	14.4	11.3	25.7	$710,601	$422,373	$1,132,974
1996	$2,892,669	14.0	11.0	25.0	$1,467,645	$872,352	$2,339,998
1997	$2,867,442	13.6	10.7	24.3	$1,438,407	$854,973	$2,293,380
1998	$5,398,366	13.2	10.4	23.6	$2,677,056	$1,591,213	$4,268,268
1999	$4,142,946	12.8	10.1	22.9	$2,030,740	$1,207,050	$3,237,790
2000	$5,232,034	12.4	9.8	22.2	$2,534,581	$1,506,527	$4,041,108
2001	$3,370,047	12.0	9.5	21.5	$1,613,248	$958,897	$2,572,146
2002	$3,535,625	11.6	9.1	20.8	$1,672,241	$993,962	$2,666,203
2003	$4,600,455	11.2	8.8	20.1	$2,149,498	$1,277,638	$3,427,136
2004	$6,891,740	10.8	8.5	19.4	$3,180,559	$1,890,489	$5,071,048
2005	$6,032,560	10.4	8.2	18.6	$2,749,460	$1,634,249	$4,383,708
2006	$14,852,462	10.0	7.9	17.9	$6,684,156	$3,972,989	$10,657,146
2007	$3,615,642	9.6	7.6	17.2	$1,606,444	$954,853	$2,561,296
2008	$2,858,816	9.2	7.3	16.5	$1,253,793	$745,241	$1,999,035
2009	$20,770,659	8.8	7.0	15.8	$8,990,328	$5,343,752	$14,334,080
2010	$10,569,271	8.4	6.6	15.1	$4,635,375	$2,755,216	$7,390,591
2011	$7,564,456	8.1	6.3	14.4	$3,274,183	$1,946,138	$5,220,321
2012	$7,036,501	7.7	6.0	13.7	$3,005,324	$1,786,331	$4,791,655
TOTAL	$118,451,695	228.6	179.7	408.3	$54,200,277	$32,216,052	$86,416,328

Of course, no economy could exist where the only economic activity was fixing up old buildings. The strength of the Utah economy is the diversity of economic activities in the state. But it is useful to see the kind of impact historic rehabilitation has on the state's economy as compared with other sectors.

Table 5

INDUSTRY COMPARISONS IN UTAH JOBS AND INCOME PER $1,000,000 IN PRODUCTION			
INDUSTRY	JOBS	INCOME	INCOME PER JOB
Gas and Oil Extraction	7.5	$358,859	$47,956
Computer Manufacturing	3.4	$181,593	$54,157
Gasoline Station	16.7	$612,350	$36,752
Data Processing, Web Hosting	8.9	$435,748	$49,108
Legal Services	13.6	$731,663	$53,831
Home Health Care Services	26.3	$985,310	$37,451
Restaurants and Bars	25.6	$621,447	$24,300
New Construction	16.8	$809,808	$48,203
Historic Building Rehabilitation	17.6	$847,555	$48,026
Average of 434 industries	11.3	$456,804	$40,497

The table above demonstrates that historic rehabilitation is a relatively labor-intensive activity that provides good wages, particularly for those without advanced formal education. Historic preservation creates more jobs per $1 million of output than 84 percent of Utah industries and more income per $1 million of output than 90 percent of Utah industries.

Both the U.S. Congress and the Utah Legislature enacted historic tax credits to encourage the private sector to invest in historic buildings. But legislation that was intended to encourage good stewardship has turned out to be an effective economic development tool.

HERITAGE TOURISM

Utah is home to some of America's most highly visited parks, monuments, and nature areas; world-famous ski resorts; and the international headquarters of The Church of Jesus Christ of Latter-day Saints. These sites and activities drew more than 22 million visitors in 2011, generating nearly $6.9 billion in economic activity and creating 82,584 direct jobs and 41,475 indirect and induced jobs throughout the state.[2]

This section digs deeper to examine the economic impact of heritage sites and heritage-related events in Utah. Sixty-two sites and special events that fall within the definition of heritage attractions were studied. In total, these attractions recorded nearly 7.3 million visits and generated $384.6 million in direct visitor spending in 2012 (Table 6). These sites and events directly supported more than 200 direct jobs and thousands of labor hours donated by volunteers. (For information on sources and methodology, see Appendix C.) But that is only the beginning of the jobs generated from Utah's heritage tourism.

Table 6

OUTPUT			
	DIRECT	INDIRECT/INDUCED	TOTAL
Lodging	$97,120,475	$89,504,305	$186,624,780
Restaurants	$61,220,194	$54,257,058	$115,477,252
Groceries	$28,238,636	$24,865,682	$53,104,318
Shopping/Gifts/Souvenirs/Other	$33,930,143	$31,834,676	$65,764,820
Entertainment and Amenities	$28,968,316	$25,193,611	$54,161,927
Transportation-related	$135,122,236	$107,555,612	$242,677,848
TOTAL	$384,600,000	$333,210,944	$717,810,944

The direct expenditure of nearly $385 million of heritage visitor expenditure spurs an additional $333 million in indirect and induced economic activity. The combined amount of more than $700 million generates jobs in a number of economic sectors (Table 7).

Table 7

JOBS			
	DIRECT	INDIRECT/INDUCED	TOTAL
Lodging	967	735	1702
Restaurants	1155	411	1566
Groceries	486	205	691
Shopping/Gifts/Souvenirs/Other	657	262	919
Entertainment and Amenities	450	205	655
Transportation-related	892	888	1780
TOTAL	4607	2706	7313

As in the construction industry, those jobs translate into income for Utah citizens (Table 8).

[2] "Statewide Performance Indicators," Utah Office of Tourism (2011).

Table 8

INCOME			
	DIRECT	INDIRECT/INDUCED	TOTAL
Lodging	$51,468,754	$28,830,532	$80,299,286
Restaurants	$22,212,115	$15,832,992	$38,045,107
Groceries	$14,964,995	$7,697,254	$22,662,249
Shopping/Gifts/Souvenirs/Other	$15,578,873	$9,880,826	$25,459,698
Entertainment & Amenities	$10,450,972	$7,712,027	$18,162,999
Transportation Related	$84,497,189	$33,359,715	$117,856,904
TOTAL	$199,172,897	$103,313,345	$302,486,243

DEFINING HERITAGE TOURISM

Heritage tourism is a form of tourism oriented towards local history and cultural heritage. It involves travel to places and activities that represent and communicate the stories and people of the past. Some heritage sites can take several days to explore, while others take just a few hours. Heritage visitors are attracted to places that offer cultural learning experiences, such as:

- Historic sites, communities, neighborhoods, landmarks, and monuments
- Significant architectural and archaeological resources
- Parks that incorporate historic features and assets
- History and art museums that showcase artifacts or work of past generations
- Places of worship in historic locations
- Ethnic communities and neighborhoods that practice traditional ways of living
- Fairs, festivals, outdoor plays, pageants, and reenactments that represent local or state heritage

Some sites and special events are "destination attractions" that drive a visit to the state. "Signature attractions" are destinations or activities that have strong recognition and/or marketing that draws long-distance visitors. Signature attractions include the LDS Temple Square in Salt Lake City and a number of state and national parks. Historic towns such as Park City, St. George, and Ogden have heritage attractions that create unique identities and generate widespread recognition among visitors. Major annual events like festivals and pageants related to Utah's unique history and heritage can also be described as signature attractions.

Other attractions simply provide new experiences and added value during other travel. For example, visitation to heritage sites is often boosted by proximity to major attractions such as national and state parks, religious sites of significance to the LDS Church, and ski resorts.

Heritage attractions can be found in virtually every part of the state. Through various sites, visitors can learn about the way people lived and their achievements and struggles in the history of Utah's development, including:

- Native American cultures, from ancient Indian tribes to peoples encountered by early settlers to present-day communities
- Early explorers, trappers, and pioneers
- History and sites of the LDS Church
- Traditional industries such as ranching, farming, and mining
- Handicrafts and art
- The evolution of historic towns
- The construction and connection of the Transcontinental Railroad
- People of other cultures and nationalities who have settled in Utah

Heritage sites and events add value to Utah's identity and generate substantial economic benefits for their communities and regions. Significant periods in the state's history have been well memorialized, and continuing investments in historic preservation and interpretation create added value each year for the tourism economy.

UTAH'S HERITAGE VISITORS

Since the 1970s, the tourism industry has targeted travelers seeking authentic experiences. In Utah, as in many other parts of the world, heritage tourism is a growing niche in a broad market. Although it cannot easily be disaggregated from other forms of tourism for analysis, Utah is a natural destination for heritage visitors because of its wide range of sites and experiences.

Many visitors are likely members of the LDS Church who come to Temple Square and other sites as a religious pilgrimage, though no exact numbers are available. This has particular economic significance when considering the seasonality of tourism. In contrast with more seasonal festivals, people travel year-round to visit places of worship and places that they consider their homeland. Additionally, approximately 8.2 million of the LDS Church's 14 million members live outside of the U.S.[3] This represents substantial visitor potential, though only 3.6 percent of recent visitors to Utah were from other countries.[4]

Among the larger pool of tourists, heritage visitors have certain things in common. Research suggests that they are typically:

- High-spending. These visitor parties tend to spend more than average travelers on accommodations, food, outdoor recreation, art, and handicrafts. A 2008 study in Colorado found that heritage tourists spent $114 more per trip than other tourists, $62 of which was on recreational activities.[5]
- Well-educated. Education is the single most important factor that influences heritage travel.
- Older. Between the ages of 45 and 65, people have more time, are typically at the height of their careers, and have more discretionary income to engage in heritage activities.
- Well-traveled. Heritage tourists not only travel to more places, but they travel more often.
- Longer-staying than other visitors. On average, heritage tourists stay 5.8 nights, whereas other tourists stay 5.2 nights.[6]

Interviews conducted for this study with operators of heritage attractions suggest that these patterns hold true in Utah. Heritage tourists take more time to visit and spend more on hotels, historic B&Bs, restaurants, museum shops, art galleries, antique stores, Indian jewelry, and handicrafts.

[3] "Facts and Statistics," The Church of Jesus Christ of Latter-day Saints, last modified December 31, 2012, www.mormonnewsroom.org/facts-and-stats.
[4] "Economic Report to the Governor," Utah Governor's Office of Planning and Budget (November 2011), http://travel.utah.gov/research_and_planning/documents/2011ERG.pdf
[5] "Colorado Travel Year 2008: Final Report," Longwoods International (August 2009), www.colorado.com/ai/Final20Report20200820Online.pdf.
[6] "Colorado Travel Year 2008: Final Report."

"Many tourists are more interested in recreation and sightseeing, but the tourist that is interested in heritage tourism typically spends more money in the local community. They tend to stay longer to explore every aspect of the culture and history. They invest in art from the area and spend more generously because they want to keep the history alive. These individuals also tend to feel more invested in a community when connecting through heritage tourism."

- Travis Schenck, Director, Museum of Moab

TOURISTS' ECONOMIC IMPACT IN UTAH

With the exception of the ski visitor market, there has never been a survey of Utah's visitors that would allow for the development of niche market profiles. However, certain studies and surveys provide useful information about visitors on both leisure and business trips that can be used to better understand heritage visitors.

First, visitation levels for certain types of heritage attractions in the Mountain Division—which includes Utah, Colorado, Wyoming, Idaho, Montana, Nevada, Arizona, and New Mexico—are considerably higher than for the U.S. as a whole (Table 9). A notable portion of visitors to the region visit heritage-related attractions: state and national parks, historic sites and churches, museums, and special events and festivals. This is likely because the region is well known for its unusual geological features and beautiful scenery, state and national parks, and many significant historic sites. In addition, Utah has unique international recognition for its identification with the headquarters and other heritage sites of the LDS Church.

Table 9

COMPARISON OF VISITATION LEVELS FOR SELECTED VISITOR SITES

	MOUNTAIN DIVISION	U.S.
State and national parks	16%	8%
Historic sites and churches	12%	8%
Museums	10%	8%
Special events and festivals	5%	4%

Source: "U.S. Domestic Travel Market Report," U.S. Travel Association and TNS TravelsAmerica (2011).

With this in mind, information on general visitors can be extended to apply to heritage visitors. According to surveys of domestic travelers:

- Visitor parties to Utah spent an average of $420.29 per trip, excluding airfares.[7]
- On average, visitors to the region around Utah, the Mountain Division, traveled in groups of 2.1 persons for about 3.78 days.[8]
- In 2012, each visitor spent an average of $52.95 per day. This includes both leisure and business travelers.

Only 51 percent of overnight travelers in Utah stayed in paid accommodations in 2012.[9] In contrast, 42 percent stayed in private homes. This affected the direct economic impact of tourism since these travelers did not pay

[7] "Overview of U.S. Domestic Travel," TNS TravelsAmerica (2012). This figure is the weighted average of leisure and business travelers.

[8] "Domestic Travel Market Report," U.S. Travel Association and TNS TravelsAmerica (2011).

[9] "Overview of U.S. Domestic Travel" (2012).

lodging fees and taxes. Though foreign visitors typically spend more money, the low number of foreign visitors to Utah (3.6 percent) is not enough to significantly skew accommodations or other spending data.[10]

A different set of data is available for convention and business travelers. This information is highly relevant for Utah, as a high volume of travelers visits the Salt Palace Convention Center and LDS Convention Center each year in connection with religious training and missions.[11] According to a recent study:[12]

- Convention visitors to Utah take greater advantage of available activities than general business visitors: 8 percent visit historic sites and churches, 8 percent visit museums, and 5 percent visit state and national parks.
- General business visitors on overnight stays occasionally visit heritage attractions: 5 percent visit museums, 4 percent visit churches, and 3 percent visit state and national parks.
- Convention visitors stay overnight 91 percent of the time, while general business visitors stay overnight 76 percent of the time.

(See Appendix D for additional relevant data.)

Utah travel guides show 19 tourism regions across 29 counties. Most visitors who are traveling for three to four days stay within one region during their visit. This probably holds true for visitors wishing to maximize their slope time on ski trips and people who are traveling to Salt Lake City for religious activities. Trips via motorcoach tours are also common. These tours typically make stops at multiple parks and heritage sites on established routes to Yellowstone National Park, Las Vegas, or the Grand Canyon.

Park City offers one example of the symbiotic relationship between heritage tourism and other tourism markets. Each year, nearly 100,000 visitors to the Canyons, Deer Valley, and Park City resorts take the time to visit the Park City Museum. This museum, which makes creative use of a former mining shaft and city jail, provides a memorable experience that adds value to ski vacations. It also helps direct business to dozens of locally owned restaurants and stores.

WHAT ECONOMIC IMPACT DO HERITAGE VISITORS HAVE IN UTAH?

The total value of direct heritage tourism in Utah in 2012 was $384.6 million, according to visitor spending data and other information (Appendix F). This portion takes a detailed look at different types of heritage attractions, their visitation levels, and the number of direct and indirect jobs they generate.

Like many other tourist attractions, the economic impact of heritage attractions is affected by traveling periods and weather. Visitation levels and tourism dollars generated also vary according to location and ease of access.

National and State Parks

Utah's national and state parks are highly visited attractions for out-of-state visitors and state residents alike. Five national parks are located in Utah, as well as the Golden Spike National Historic Site that marks the completion of the first transcontinental railroad in 1869. Utah also has 41 state parks that collectively receive more than five million visitors annually.

Significant heritage sites were identified in nine state parks and the National Historic Site (Table 10). These parks attracted nearly 1 million visitors, employed 77 people, and created an additional 372 jobs in local

[10] "Economic Report to the Governor."
[11] The LDS Church has a policy of not publicly releasing visitation figures. Data was provided by the church for this study and was aggregated with other sites for purposes of projecting overall economic impact of heritage sites.
[12] "Domestic Travel Market Report" (2011).

communities in fiscal year 2012. Their overall impact from visitor spending was $13.1 million.[13] Utah's public lands also include national monuments, and lands managed by the Bureau of Land Management and the Forest Service.

Table 10

SIGNIFICANT HERITAGE SITES IN STATE AND NATIONAL PARKS	
NATIONAL PARKS	
Location	*Site Name*
Corinne	Golden Spike National Historic Site
STATE PARKS	
Location	*Site Name*
Blanding	Edge of the Cedars State Park Museum
Boulder	Anasazi State Park Museum
Cedar City	Frontier Homestead State Park Museum
Fairfield	Camp Floyd-Stagecoach Inn State Park and Museum
Fillmore	Territorial Statehouse State Park Museum
Midway	Wasatch Mountain State Park, John Huber House and Creamery
Sevier	Fremont Indian State Park and Museum
Syracuse	Antelope Island State Park, Fielding Garr Ranch
Vernal	Utah Field House of Natural History State Park Museum
Total Employees	77
Total 2012 Visitation	953,181
Overall Direct Impact	$13,100,000

Sites of Historical interest

Utah contains many sites of historical interest outside parks, including historic sites, landmarks and monuments, architectural and archaeological treasures, places of worship in historic locations, and other places where visitors can learn about traditional ways of living. In 2012, these sites employed 60 people and attracted more than 5.7 million visitors in total (Table 11).

Table 11

SITES OF HISTORICAL INTEREST	
LOCATION	NAME
Bluff	Bluff Fort Historic Site
Brown's Park	John Jarvie Ranch
Cove Fort	Cove Fort Historic Site
Fairview to Page	Mormon Pioneer National Heritage Area
Hanksville	Wolverton Mill
Logan	Logan Utah Temple
Logan	Logan Tabernacle, Family History Center
Logan	Historic Downtown Logan
Manila	Swett Ranch
Mount Carmel	Maynard Dixon Living History Museum
Parowan	Parowan Historic Cemetery
Parowan	Dr. Meeks Pioneer Farmstead and Urban Fishery
Salt Lake City	Historic Temple Square, location of the Salt Lake City Tabernacle, the Beehive House, Church History Museum, Family History Museum, and other historic buildings established by the LDS Church

[13] "Economic Impact of Park Visitor Spending FY2012," Utah State Parks Division of Parks and Recreation.

St. George	Brigham Young Winter Home, St. George LDS Tabernacle, and Jacob Hamblin Home
Stansbury Park	Historic Benson Grist Mill
Total Employees	60
Total 2012 Visitation	5,753,372

Museums

Utah contains approximately 260 museums operated by public and private organizations throughout the state. These museums provide extensive learning opportunities for visitors and residents alike. Nearly 7 million people visited Utah's museums in 2012—a significant increase from the 4.4 million visitors reported in 2011.[14]

Most museums are operated by volunteers who donate tens of thousands of hours annually to care for museum collections and keep facilities open for visitors. However, 15 of the largest museums employ nearly 40 professional curators and full-time administrative staff and attract close to 350,000 visitors each year (Table 12).

Table 12

MUSEUMS WITH PAID STAFF	
LOCATION	NAME
Cedar City	Cedar City Daughters of the Utah Pioneers Museum
Delta	Great Basin Museum
Hyrum	Hyrum City Museum
Logan	Museum of Anthropology
Moab	Museum of Moab
Monument Valley	Goulding's Museum and Trading Post
Ogden	Union Station
Paradise	Paradise Daughters of Utah Pioneers Museum
Park City	Park City Museum
Parowan	Parowan Historic Cemetery
Parowan	Rock Church Museum
Richmond	Richmond Daughters of Utah Pioneers Museum
Roy	Roy Historical Museum
Springdale	Zion Human History Museum
Wellsville	American West Heritage Center and Festivals
Total Employees	39
Total 2012 Visitation	346,268

Heritage Events

Special events help convince people to travel and spend money in other local economies. In Utah, thousands of visitors—both state residents and out-of-state visitors—participate in heritage events each year. Some of the largest annual events keep records of their visitors, but many public events do not. A look at 11 of the most well known heritage events in Utah shows that they generate about 30 jobs and attract more than 200,000 visitors each year (Table 13).[15]

[14] "2013 Museum Survey," Office of Museum Services, Utah Division of Arts & Museums, http://arts.utah.gov/resources/publications_surveys/documents/museum_survey_report_13.pdf; "2012 Museum Survey," Office of Museum Services, Utah Division of Arts & Museums, http://arts.utah.gov/resources/publications_surveys/documents/museum_survey_report_12.pdf.

[15] For event listings, see Now Playing Utah (www.nowplayingutah.com) and the Utah Office of Tourism (http://www.travel.utah.gov/events_calendar/index.html).

Table 13

HERITAGE EVENTS	
LOCATION	NAME
Blacksmith Fork Canyon	Old Ephraim's Mountain Man Rendezvous
Boulder	Boulder Heritage Festival
Brigham City	Brigham City Heritage Arts Festival
Clarkston	Clarkston Pony Express Days
Corinne	Golden Spike National Historic Site Railroaders' Festival
Logan	Echoing Traditional Ways Pow Wow
Logan	Logan Pioneer Day Celebration
Manti	Mormon Miracle Pageant at the Manti Utah Temple
Ogden	Pioneer Days
Salt Lake City	Living Traditions Festival
Spring City	Heritage Day
Total Employees	31
Total 2012 Visitation	209,917

Listed sites were identified by the State Tourism Office and other stakeholders.

CONCLUSIONS

- In Utah, tourism is a major contributor to the state's economy. The wide variety of Utah's heritage attractions makes the state an ideal destination for heritage tourism.
- Utah's heritage sites counted 7,262,738 visits and provided a direct economic impact of $384.6 million in 2012.
- Heritage sites draw tourists, businesspeople, and volunteers who spend money in local businesses.
- Heritage tourism is difficult to separate and quantify from other market sectors because visitors typically patronize more than one type of activity while traveling. However, it is evident that heritage attractions add value to visits for other purposes, such as religious pilgrimages and seasonal attractions like skiing.
- At this time, there is insufficient data to separate the missionaries, skiers, business travelers, and outdoor recreational tourists from heritage tourists. The necessary data can be obtained through a visitor survey that asks Utah travelers questions about their motivations in visiting, their demographics, what they did during their trips, how long they stayed, how many people were in their travel parties, and how much money they spent.

CASE STUDY: THE MORMON PIONEER HERITAGE TRAIL, A NATIONAL HERITAGE AREA

The Mormon Pioneer National Heritage Area (MPNHA) runs through 400 miles of scenic landscapes and small towns in central and southern Utah. It is the first and only Congressionally designated heritage area in the state. More than six million visitors come to the trail each year to learn about the Mormon colonization experience.[16] Since its establishment, the MPNHA has generated more than $24 million toward the area's economy through increased tourism and business.[17]

The original enabling legislation in 2006 authorized a budget of $1 million per year for the first five years from the National Park Service. These funds are required to be matched by receiving entities, chiefly the cities, small towns, nonprofit organizations, and other partners within the area. One hundred community partners have united in efforts coordinated by the Highway 89 Alliance, a nonprofit organization that manages competitive grant funding and marketing and measures economic progress.

The Alliance has used federal funding to pursue the development of a $4 million interpretive center that will preserve Utah Pioneer heritage arts and other artifacts. Community partners have contributed matching funds and leveraged other resources to encourage economic progress that is vital to communities within the area. In 2012 alone, partners invested over 39,000 volunteer hours of labor worth more than $705,000. They have also contributed more than $1 million towards heritage projects and historic building preservation, interpretation, and wayfinding signage.

According to Monte Bona, the executive director of the Alliance, next steps are to increase marketing and promotion to build the MPNHA's awareness and visitation. The Alliance has produced a map to guide visitors through the area, as well as two feature-length videos that share the stories, struggles, and successes of the pioneers who established small towns every 50 miles—the maximum distance a telegraph could carry messages in the 19th century.

The experience doesn't stop with the pioneer era. Visitors travel to the area via the Utah Heritage Highway 89 and Scenic Byway 12, also known as Utah's first "All-American Road." For those who appreciate traditional farms, parks, monuments, memorials, replicas, churches, and cultural events, driving on Highway 89 is a trip through time. Old-fashioned drive-in ice cream shops, family-owned motels, and B&Bs along the route offer the distinctive ambiance of the 1950s and 1960s.

[16] This figure includes nearly 5.4 million in visitation to Bryce Canyon and Zion National Parks, two of America's most visited parks that are internationally known for their unique geology. While they are significant draws for tourism, these parks are not heritage sites within the definition of this study. Subtracting their visitation, the MPNHA received an estimated 621,130 visitors in 2012.

[17] "Mormon Pioneer National Heritage Area," prepared by the Utah Heritage Highway 89 Alliance for the Alliance of National Heritage Areas (2009-2012), http://history.utah.gov/events_and_news/press_room/documents/PRESS%20RELEASE%20-%202012%20MPNHA%20Annual%20Report.pdf.

PROPERTY VALUES

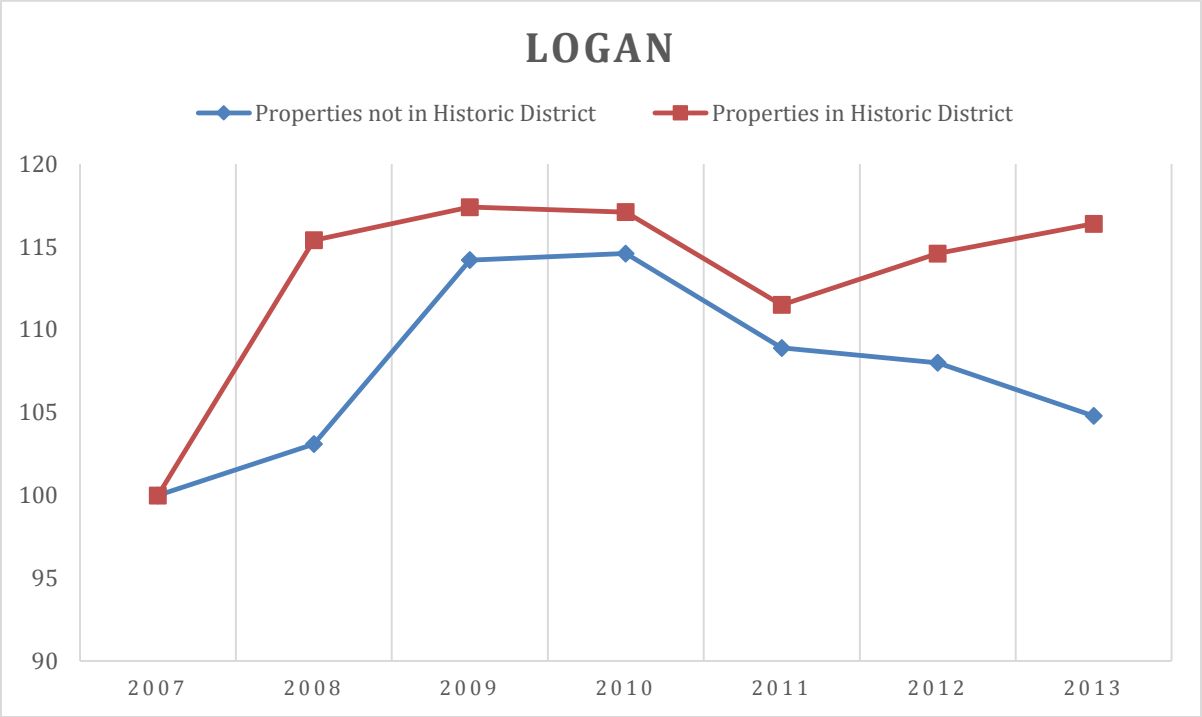
In Utah, 70 percent of households own their homes. For most of those families, their largest asset is their house. Some see the value of that house as the source of funds for a comfortable retirement. For others, it will be the biggest legacy they leave to their children. And that building is not just a financial asset: It is also the family home.

For these reasons, Utah citizens are rightly concerned if there is a proposed set of restrictions that might reduce the value of their property. Homeowners sometimes oppose historic districts with the belief that another layer of regulations will diminish the value of their primary asset. Because of this concern, it is essential to understand the relationship between historic districts and property values.

To understand historic districts' impact on property values, multiple years of assessment data in five Utah cities were evaluated. Average values were calculated for single-family houses within historic districts. Those values were compared with the average values of single-family homes not in historic districts. The average value in each category was assigned an index number of 100. Then, annual changes in value were measured against the base year of available data. The results were clear.

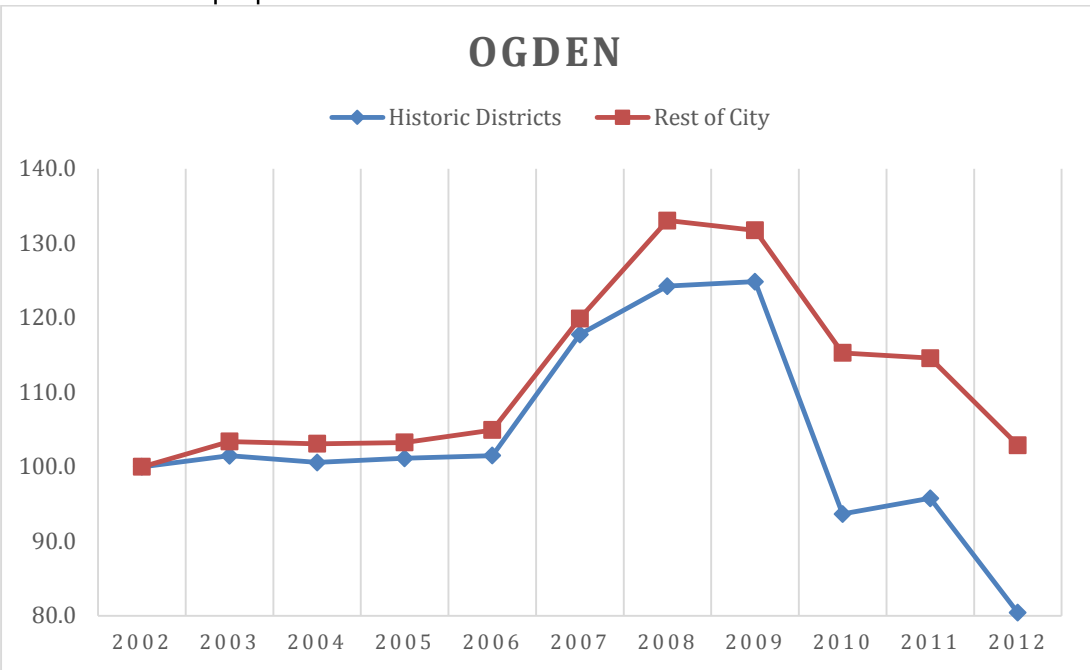
Logan

Using 2007 as base, properties in Logan's historic district appreciated at a faster rate than the rest of the city. Like properties all over Utah, the second half of the decade saw a decline in values, a pattern that has continued for most houses in Logan. Beginning in 2011, however, property values in the historic district began to recover. By 2013, the average values had nearly reached their pre-crash peak.



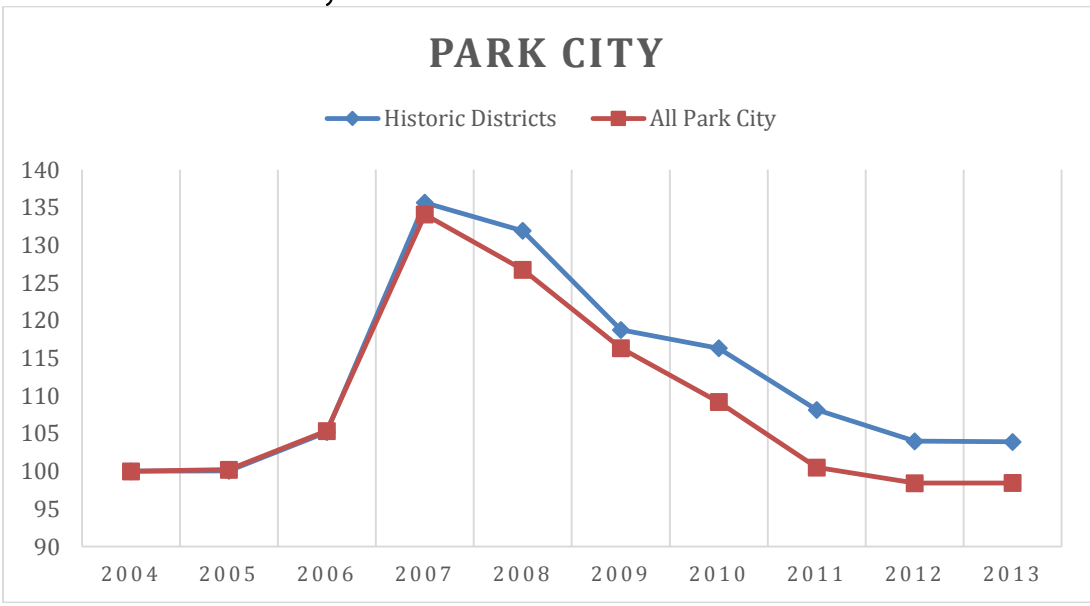
Ogden

Ogden was the one city that did not follow the pattern of the other four. For the first six years of available data (2002-2007), the value change of properties within historic districts paralleled the rest of the city. However, when the real estate crisis hit, the decline in the assessed value of homes in historic districts was steeper than other houses. Local experts named several possible reasons for this: 1) the very large size of the historic district, 2) a much lower rate of homeownership than in other parts of the city, and 3) undervaluation of historic houses for taxation purposes.



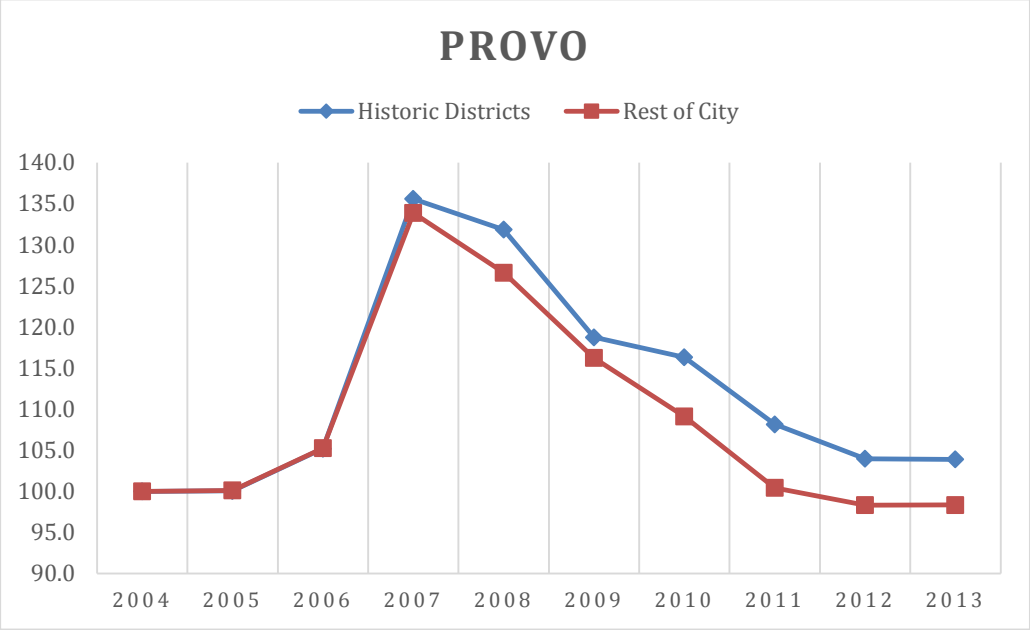
Park City

Park City includes some of the state's most expensive real estate. During the boom years between 2004 and 2007, property values rose rapidly, with the rate of appreciation of houses in historic districts slightly greater than other housing stock. Both historic and non-historic houses have declined significantly from the peak, but houses in historic districts measurably less so.



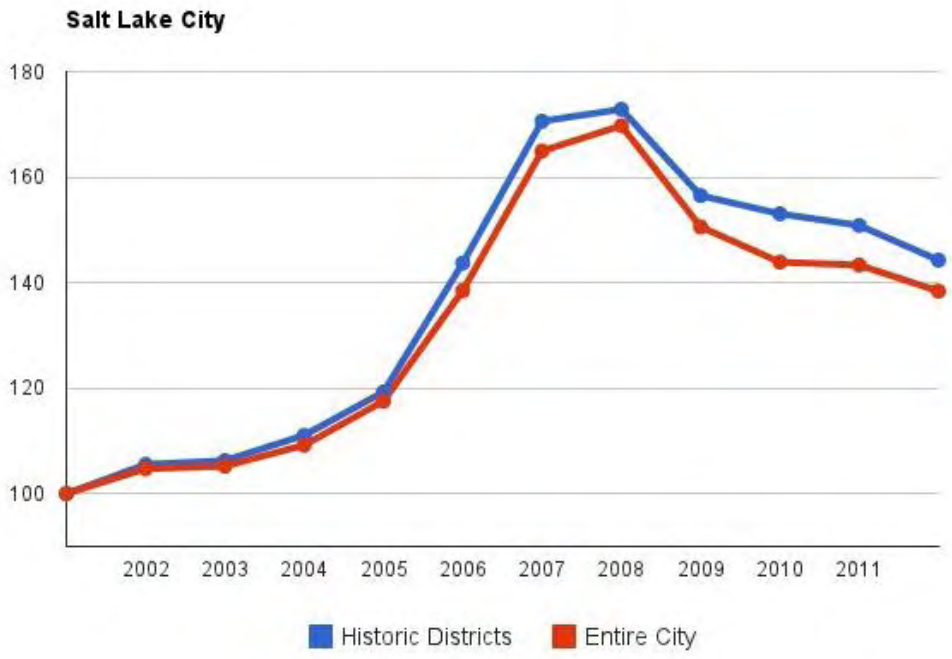
Provo

In a pattern strikingly similar to Park City, houses in Provo's historic districts slightly outpaced the rest of the city in appreciation between 2004 and 2007. In the decline of values from their peak, houses in historic districts have fared better. The average value today of a house in a historic district is about 4 percent greater than it was a decade ago, while the other houses are still below their 2004 values.



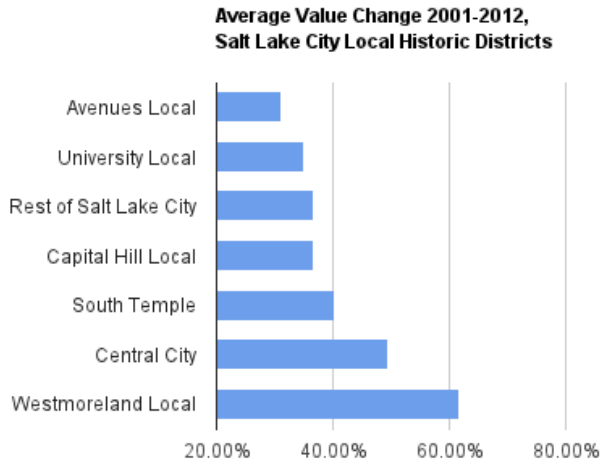
Salt Lake City

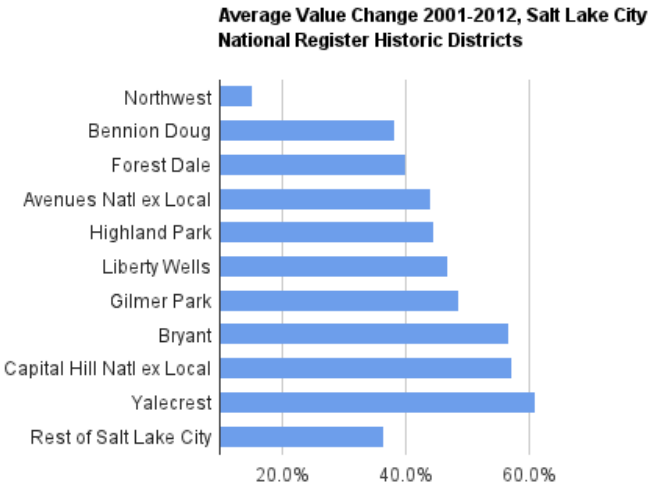
Again, in a pattern strikingly similar to Park City and Provo, houses in Salt Lake City's historic districts slightly outpaced the rest of the city in appreciation between 2004 and 2007. In the decline of values from their peak, houses in historic districts have fared better. The average value today of a house in a historic district is about 4 percent greater than it was a decade ago, while the other houses are still below their 2004 values.



Salt Lake City has a number of both National Register historic districts and locally designated historic districts. The change in value from 2001 to 2012 was calculated for each of these districts and compared to the average change in value for all single-family houses in Salt Lake City not located in any historic district. In that decade, the average value of a single-family house in Salt Lake City increased 36.6 percent. Four of the six local historic districts and nine of the ten National Register districts had rates of appreciation greater than that of the city as a whole. There was no evidence that being in either type of historic district negatively impacted the value.

National Register calculations exclude properties in local districts.

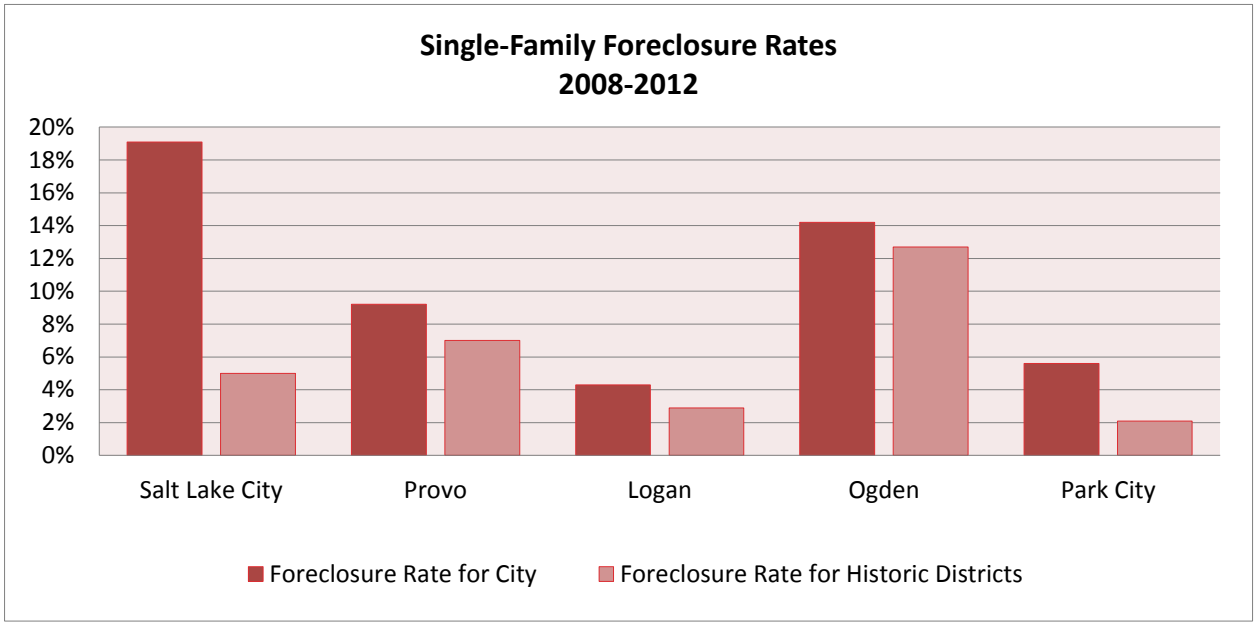




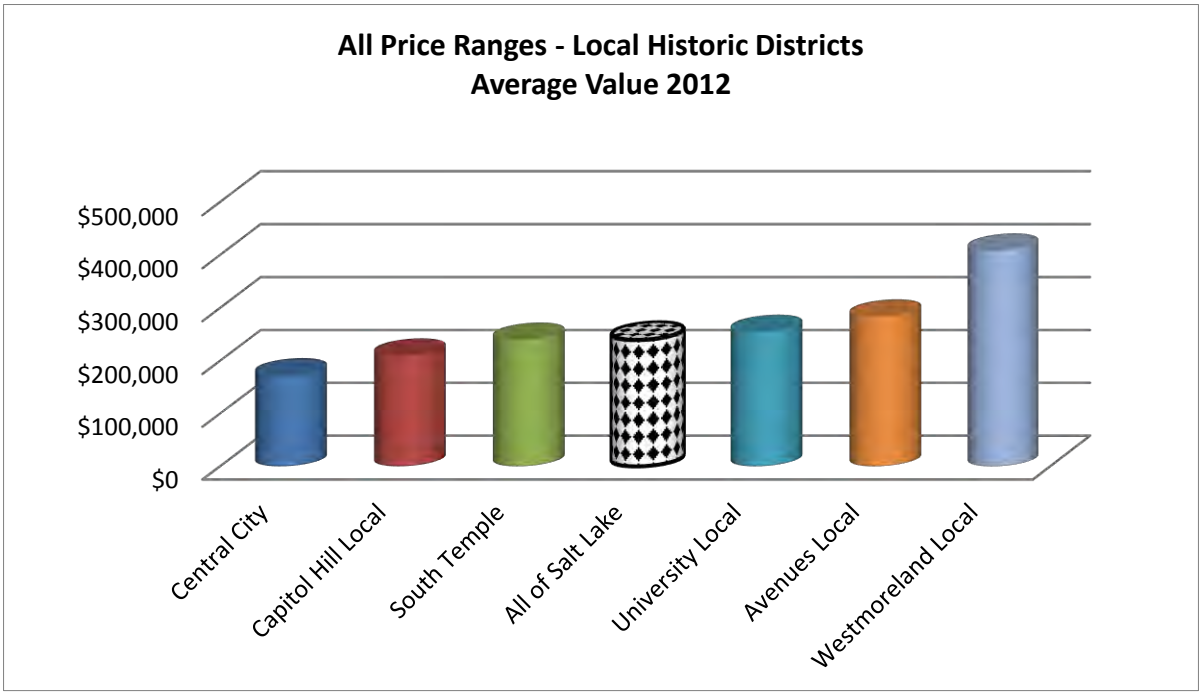
PROPERTY VALUES IN A DECLINING MARKET

For a decade or more, bankers, real estate brokers, and homeowners were focused on—sometimes obsessed with—the annual appreciation rates of houses. The data on the previous pages demonstrates that houses in historic districts were a good bet for higher than average rates of appreciation. But then came the nationwide real estate crash and subsequent foreclosure crisis in 2007, from which the country is still recovering. How have houses in Utah historic districts weathered that storm?

Over the last five years, in every one of the five cities studied, the rate of foreclosure of single-family homes in historic districts was less than the rate in the rest of the community—often substantially so. The fundamental value of historic houses and the greater stability of historic district properties meant that fewer homeowners lost their houses and fewer banks were saddled with foreclosed properties than elsewhere in the same city.



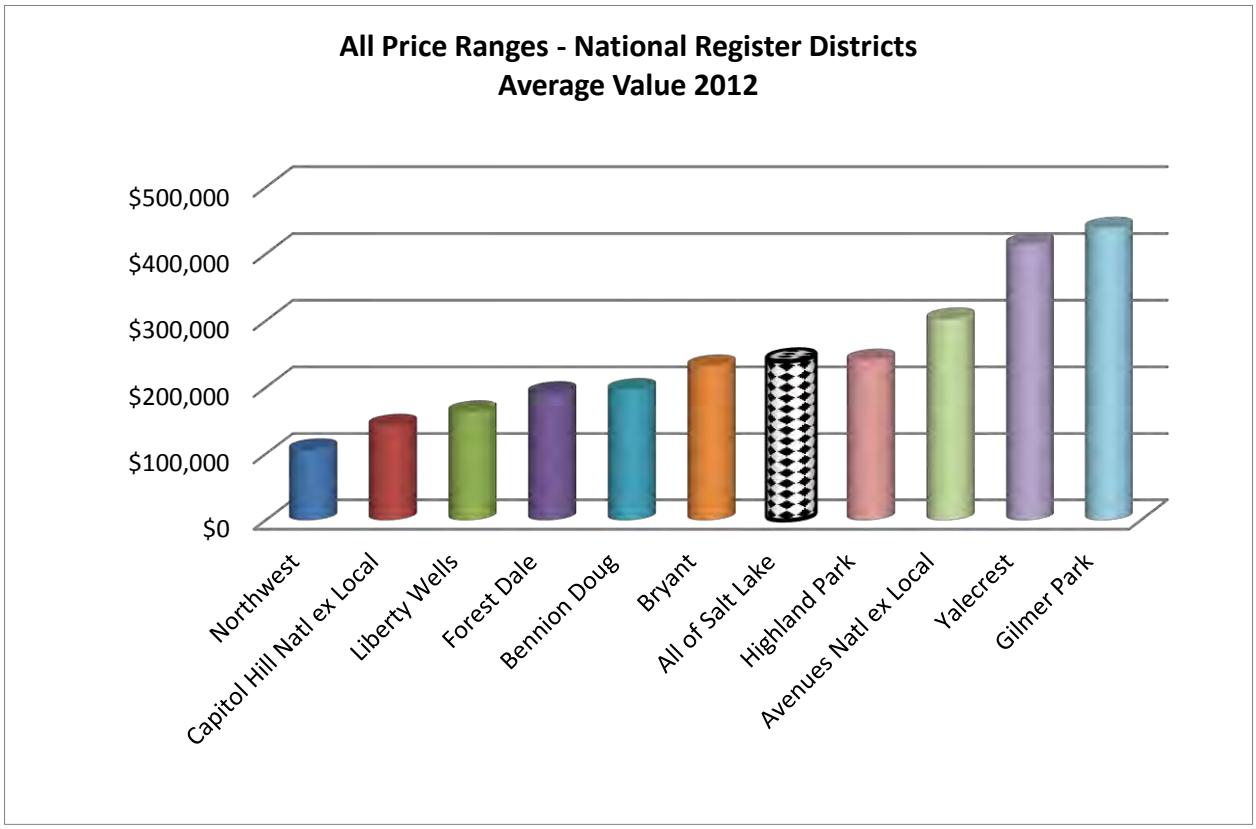
A skeptic might say, "OK, but that's just because those historic districts are where rich people live and the houses all have high property values—of course there were fewer foreclosures." That simply is not the case in Salt Lake City. While some historic districts certainly have very expensive homes, home values in historic districts actually provide a wide range of price options.



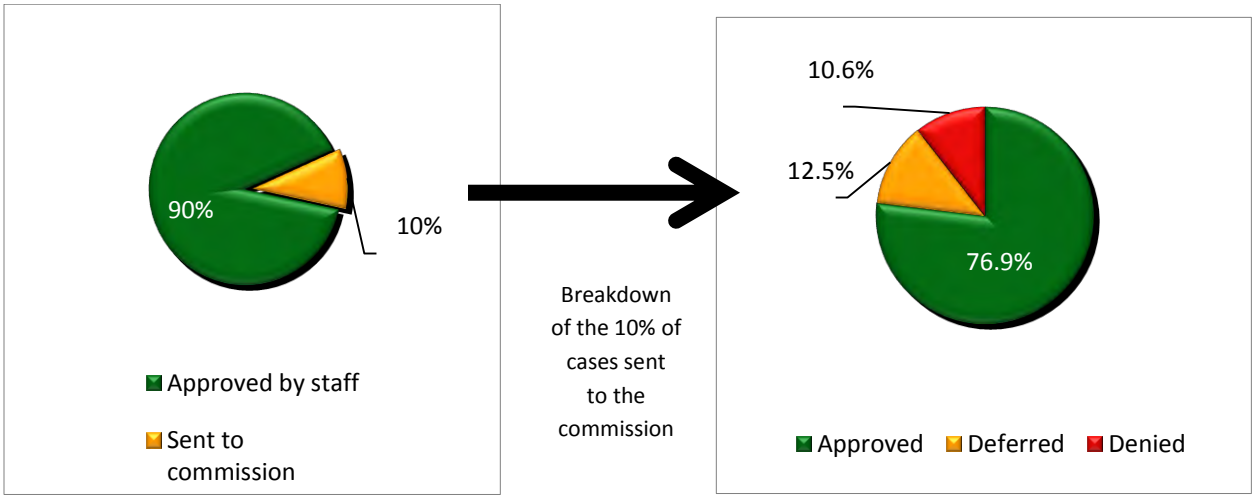
In 2012, the average value for a single-family house in Salt Lake City that was not located in a historic district was $239,257. Of Salt Lake City's six local historic districts, the average home value was higher than the citywide average in three and lower in three.

For properties located within National Register historic districts but not in a local district, the same pattern holds true. Of the ten National Register districts in Salt Lake City, four have average values greater than the

citywide average, and six have averages below that of the city. This is solid evidence that historic districts are providing quality housing for Utah households at nearly every income level.



Then what of the claim that local preservation commissions make it exceedingly difficult to make changes to one's home? Again, the reality and the claim are far apart. For this study, the records of the Salt Lake City Historic Preservation Commission from 2004 through 2012 were examined. Of the applications that were presented, over 90 percent were approved at the staff level with no need for the applicant to appear before the commission at all. Of the ten percent forwarded to the commission, nearly 77 percent were approved and another 12 percent deferred, most of which were ultimately approved when requested modifications in the plans were made. Only 10 percent of all cases heard by the commission – roughly only 1 percent of all applications – were denied. This is hardly a pattern that supports a "they're just in business to say no" claim.



CONCLUSIONS

- In good times, properties in most historic districts outperform the rest of the market.
- In tough times, the decline in value is usually less.
- The quality and relative value stability of homes in historic districts reduces the likelihood of foreclosure.
- There are homes in historic districts that are affordable for households across a wide range of income brackets.
- The overwhelming percentage of proposed changes to houses in local historic districts are quickly approved.

SUSTAINABILITY

Preservation in Utah demonstrates how responsible stewardship of the built environment can ensure the long-term availability of the natural environment for cultural, recreational, and economic uses.

Early preservation advocates focused narrowly on cultural values. However, after the National Historic Preservation Act passed in 1966, many preservationists expanded their perception of the field and its role. They recognized preservation's ability to save energy and material resources, and they noted the economic revitalization stimulated by the preservation and adaptive reuse of historic buildings.[18] This expanded view is echoed in the current definition of sustainability as a practice with social, environmental, and economic elements.

A number of iconic buildings in Utah have gained national attention for using historic preservation as a sustainability strategy. For example, the designers of the Utah State Capitol seismic upgrade incorporated fly ash concrete in its foundations, beams, and shear walls, which reduced the amount of concrete used.[19] In turn, this lowered carbon emissions. Fort Douglas was repurposed as a Community of Scholars for the University of Utah instead of razing and replacing buildings. Historic warehouse buildings such as the Fuller Paint Company Warehouse in Salt Lake City and the Scowcroft Warehouse in Ogden have been successfully adapted for reuse. And commercial buildings like the First Security Bank Building have been rehabilitated using both Historic Rehabilitation and New Markets Tax Credits.

These diverse projects have social and economic benefits, but they don't stop there. They also foster environmental sustainability by avoiding demolition, concentrating development in established areas, and preserving open land.

This chapter focuses on the significant intersections of historic preservation and environmental sustainability. It begins with a brief discussion of the inherently sustainable elements in historic buildings. It then explains the indicators used to gauge building performance, with particular attention to the preservation and reuse of historic buildings. Finally, it discusses how current tools and retrofit technologies are making historic buildings even more energy-efficient.

HISTORIC BUILDINGS: INHERENTLY SUSTAINABLE

Older buildings were constructed with heavier masonry materials for thermal mass, natural ventilation strategies for cooling, and strategically placed openings for daylighting. These passive approaches provided basic thermal and lighting comfort.

Yet these elements disappeared from commercial buildings with the advent of new technologies. Fluorescent lamps and double-paned windows were introduced in the 1930s, and air conditioning became widely used after World War II. Aluminum curtain walls became a common element in commercial buildings beginning in the 1950s.
These products transformed commercial buildings. Problems created by thermal deficiencies in newer building designs were "solved" by increasingly larger and more complex heating, ventilating, and air conditioning systems powered by cheap electricity. However, greater environmental awareness in the 1960s

[18] Diane Maddex, ed., *New Energy from Old Buildings* (Washington, DC: National Trust for Historic Preservation/Preservation Press, 1981); Advisory Council on Historic Preservation, *The Contribution of Historic Preservation to Urban Revitalization* (Washington, DC: U.S. Government Printing Office, 1979).
[19] P. Kumar Mehta and Helena Meryman, "Tools for Reducing Carbon Emissions Due to Cement Consumption," *STRUCTURE* (January 2009), 11-12, 14-15.

and the energy crises of the 1970s prompted a review of how buildings directly and indirectly impacted the environment. By the 1990s, energy-sensitive designs had become popular, and the concept of sustainability continues to evolve in the commercial building industry today.

Older houses also incorporate natural ventilation and daylighting into their designs, but they have more issues with energy efficiency. These stem from little or no insulation, inefficient performance of existing windows, poorly controlled air infiltration, and inefficiencies in mechanical and electrical systems. However, building envelopes and mechanical, electrical, and plumbing (MEP) systems can be upgraded to improve residential energy performance. (See Making Historic Buildings More Energy Efficient section.)

ENVIRONMENTAL INDICATORS

A range of indicators helps to quantify the energy consumption of new and historic buildings. The LEED rating system is the primary contemporary indicator used to comprehensively assess building sustainability. Other environmental indicators allow designers and analysts to compare the potential performance of particular design options in future building performance. These indicators include the energy utilization index (EUI), embodied energy, material flows, life cycle assessment, and public health costs.

LEED

The United States Green Building Council, a private nonprofit organization, developed the first LEED (Leadership in Energy and Environmental Design) rating system in 1993. Originally focused on new construction, the LEED now includes nine rating systems for different building types and project scales:

- New Construction and Major Renovations
- Existing Buildings Operations and Management
- Commercial Interiors
- Core and Shell Development
- Retail
- Schools
- Homes
- Neighborhood Development
- Healthcare

The rating systems include five primary credit categories that award points when specific criteria are met. These main categories are sustainable sites, water efficiency, energy and atmosphere, materials and resources, and indoor environmental quality. Additional credit categories exist for aspects found within a particular building type (e.g., location and linkage credits for Homes or Neighborhood Development). The point total determines the level of success, from Certified (lowest) to Silver, Gold, and Platinum (highest).[20]

While the original LEED for New Construction rating system was not intended to be applied to the rehabilitation of existing buildings, it was the only rating system available. As a result, many early rehabilitation and reuse projects were evaluated under the New Construction rating system. It was not impossible for rehabilitation projects to score well, but the rating system's focus could be insensitive to the construction technologies and historic character-defining features found in historic buildings. Despite this, projects like the Fuller Paint Company Building and the Scowcroft Warehouse were able to successfully respectively achieve LEED Gold and Silver ratings and still qualify for Historic Rehabilitation Tax Credits. Subsequent review and reallocation of credits in the ranking system now provide an enhanced opportunity for even further success in applying LEED to historic buildings. As a result, there have been more and more buildings that have qualified for both LEED Platinum and Historic Rehabilitation Tax Credits, including the

[20] United States Green Building Council. *LEED*. accessed June 23, 2013. http://www.usgbc.org/leed/rating-systems

Christman Construction Company in Lansing, Michigan, which became the first historic building to earn triple platinum status.[21]

Energy Utilization Index

The Energy Utilization Index (EUI) measures energy consumption per square foot per year. This provides a way to compare the energy performance of buildings that are similar types but different sizes or ages. In a study released in 2008, the U.S. Department of Energy found that commercial buildings constructed in the 1960s, 1970s, and 1980s are poor energy performers with high EUIs (Table 14). Most surprising to many, however, was that buildings constructed before 1920 and after 2000 have very similar low EUIs. In fact, buildings built after 2000 have an EUI only 0.6 percent better than that of commercial buildings built prior to 1920.

Residential buildings are a different story. Recently constructed residential buildings have the lowest (best) EUIs, while houses built in the early 20th century consume the most energy (Table 15). Older houses' low energy performance has prompted calls for upgrades (See Making Historic Buildings More Energy Efficient section).

Table 14

ENERGY UTILIZATION INDEX FOR NON-MALL COMMERCIAL BUILDINGS[22] Average energy consumption in kBtu/sf	
Before 1920	80.2
1920 – 1945	90.3
1946 – 1959	80.3
1960 – 1969	90.9
1970 – 1979	95.0
1980 – 1989	100.1
1990 – 1999	88.8
2000 – 2003	79.7

Table 15

ENERGY UTILIZATION INDEX FOR RESIDENTIAL BUILDINGS[23] Average energy consumption in kBtu/sf	
Before 1939	56
1940 – 1949	54
1950 – 1959	49
1960 – 1969	47
1970 – 1979	46
1980 – 1989	41
1990 – 1999	39
2000 – 2001	37

Embodied Energy

The next performance metric is embodied energy, which the Advisory Council on Historic Preservation (ACHP) defined in 1979 as "the energy used to process the materials required to construct the building and that [energy] needed to put them into place."[24] The idea found limited acceptance at the time, and modern arguments around embodied energy are still met with doubt. However, a new idea has emerged in the past two decades: the concept of "avoided impacts," or minimizing (if not eliminating) energy use for demolition and new construction.

The concept of avoided impacts recognizes that the energy used to construct a new building must be "recovered" before the new building saves net energy. Building construction involves manufacturing and transporting new building materials to the job site, as well as fabricating the building. Even a new energy-efficient house can take 12 to 15 years to recover that energy. Razing a house to replace it with a similar but more energy-efficient house will nearly double the recovery period.[25] This is due to the energy involved in demolition and transportation of waste materials, as well as the embodied energy of the original house. For a

[21] Robert A. Young. *Stewardship of the Built Environment*. Washington, DC: Island Press, 2012, 176-182.
[22] U.S. Energy Information Administration, "Residential Energy Consumption Survey" (2010).
[23] U.S. Department of Energy, "Commercial Building Energy Consumption Survey, 2003" (2006).
[24] Advisory Council on Historic Preservation, *Preservation and Energy Conservation* (Washington, DC: Advisory Council on Historic Preservation, 1979).
[25] Wayne Curtis, "A Cautionary Tale: Amid Our Green Building Boom: Why Neglecting the Old in Favor of the New Just Might Cost Us Dearly," *Preservation* (January/February 2008).

new office building, the recovery period for construction is 40 years, while it is closer to 65 years if demolition of an existing building is involved.

Many sustainability proponents talk of creating a sustainable environment by tearing down old buildings and replacing them with buildings that are more energy efficient. They typically justify the benefits based on the new building's lower operational energy usage. However, this view does not account for the energy needed to construct the new building or the demolition energy needed to remove the existing building. It also disregards the inherent embodied energy within the existing building itself.

As shown in Table 16, the recovery period for a new building is excessive even if it is constructed on undeveloped land. In fact, the full recovery period exceeds the expected useful life of buildings being constructed today. There is no full recovery of energy, since the building will most likely be demolished before the recovery period ends.

Table 16

CALCULATING ENERGY RECOVERY RATE[26]

The time needed to recover the energy used to construct a new energy-efficient building can be calculated by comparing the energy performances of new and existing buildings.

Embodied energy for new building: 1,200 kBTU/sf
Existing building annual operating energy: 70 kBTU/sf
New building annual operating energy: 35 kBTU/sf

The energy recovery rate is the consumption difference between the new and existing buildings:

Energy Recovery Rate = $\text{Energy Rate}_{\text{existing}} - \text{Energy Rate}_{\text{new}}$
= 70 kBTU/sf – 35 kBTU/sf
= 35 kBTU/sf

The recovery period is calculated by dividing the embodied energy expended to construct the new building by the energy recovery rate:

Energy Recovery Period = Initial Embodied Energy ÷ Energy Recovery Rate
= 1,200 kBTU/sf ÷ 35 kBTU/sf
= 34.2 years

It will take 34.2 years to recover the energy used to construct the building before any energy is actually saved.

[26] Mike Jackson, "Embodied Energy and Historic Preservation: A Needed Reassessment," APT Bulletin 38, no. 4 (2005).

Material Flows

Material flows are the volume of construction and demolition materials that flow into and out of the site. Quantifying material flows offers a relative indicator of the impacts of converting raw materials into new building material, as well as the impacts of demolition and construction waste on landfills. In many cities nationwide, deconstruction and salvage companies remove materials from the construction and demolition waste stream: bricks, concrete, masonry, lumber, paving materials, shingles, glass, plastics, aluminum, steel, drywall, insulation, roofing materials, plumbing fixtures, electrical materials, and siding. In many cases, these materials provide replacement components for preservation or adaptive use projects. While deconstructing buildings and recycling the materials is an increasingly common demolition practice, the potential extent of this activity has yet to be reached. The Environmental Protection Agency reports that much of the estimated 170 million tons generated from building, renovation, and demolition projects across the United States can be reused.[27] A number of communities have passed local ordinances requiring recovery of construction and demolition materials.[28]

"Reduce, reuse, and recycle" is often cited to keep recyclable materials out of the landfill. This concept has public support when it comes to aluminum, glass, and plastic containers, but falls short of the same public application when it comes to buildings. This is despite the fact that building construction uses 40 percent of the world's resources and generates 40 percent of the material going into landfills.[29]

One alternative to razing a building is to move it. Older buildings have been moved despite the potential obstructions posed by overhead telephone and power lines. Moving masonry buildings is more difficult due to the building weight and the need to stabilize unreinforced masonry. Still, a recent example in Salt Lake City demonstrates in rather spectacular fashion that relocation is possible. The Odd Fellows Hall in Salt Lake City was constructed in 1891 of unreinforced masonry. When a planned addition to the Frank Moss U.S. Federal Courthouse threatened the building, it was moved across the street. This move prevented six million pounds of building material from going to a landfill—a significant environmental win.

An investigation of the 1904 G. H. Schettler House in Salt Lake City compared the flow of new material used in construction with the flow of demolition materials in three scenarios. Each scenario reflected a national trend: retention and rehabilitation of the existing house (#1), construction of a similar house in the suburbs (#2), and the demolition and duplication of the existing house (#3).[30] In Scenario #3, the replacement house was calculated to be identical to the original two-story brick house, though replacement houses are typically much larger.

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[27] U.S. Environmental Protection Agency, "Reducing Waste," accessed June 23, 2013, http://www.epa.gov/greenhomes/ReduceWaste.htm.

[28] Institute for Local Self-Reliance, "The New Rules Project: Recycling and Solid Waste," accessed June 23, 2013, http://www.ilsr.org/rule/recycling-and-solid-waste.

[29] "Green Builders" (Trenton, NJ: NJN Public Television and Radio, 2009), DVD.

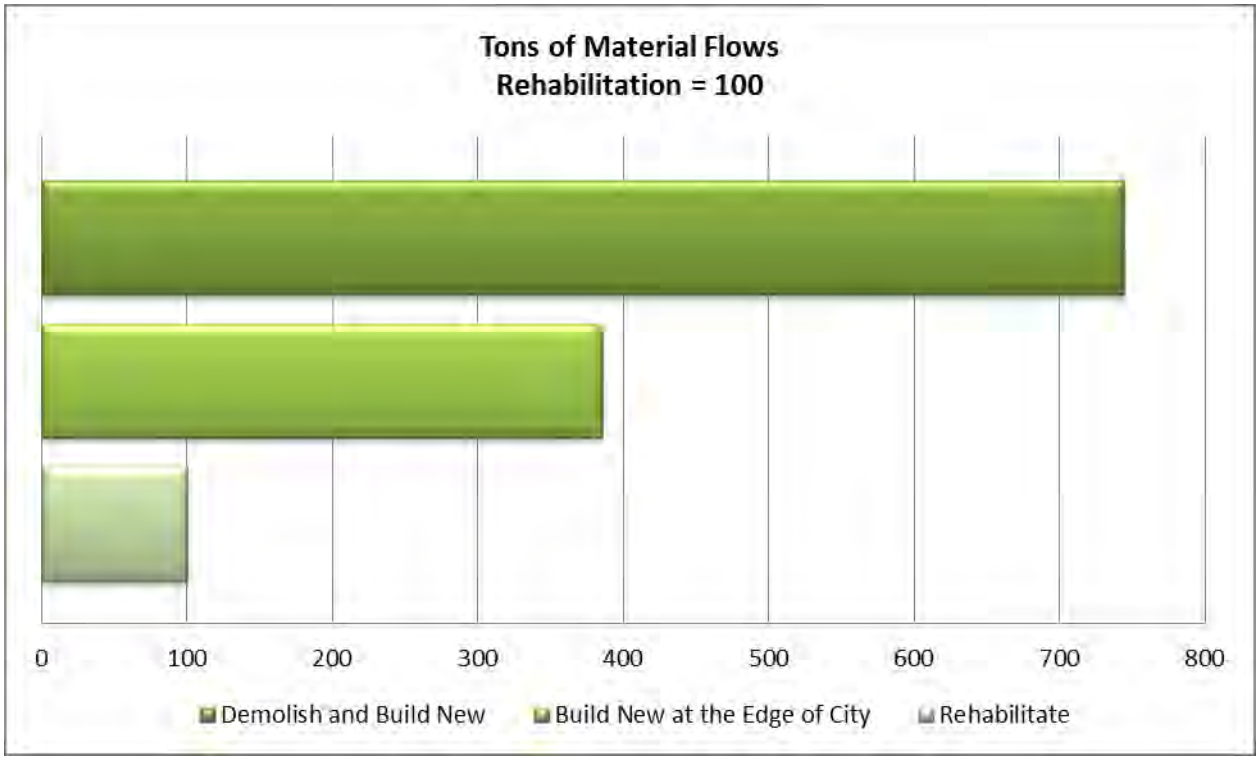
[30] Robert A. Young, "Stewardship of the Built Environment: The Emerging Synergies from Sustainability and Historic Preservation," in *Archipelagoes: Outposts of the Americas: Enclaves amidst Technology*, eds. Robert Alexander Gonzales and Marilys Rebecca Nepomechie (Washington, DC: Association of Schools and Colleges of Architecture, 2004), 35-50.

The study analyzed the material flows for each scenario, including the extraction of new raw materials and the impacts of construction and demolition wastes on the landfill (Table 17). The rehabilitation of the existing house had the lowest cumulative amount of material flows by far. New suburban construction generated a material stream 4 times greater than rehabilitation, while the material stream of demolition and duplication was 7.4 times greater.

Table 17

MATERIAL FLOW COMPARISON	
SCENARIO	TOTAL MATERIAL STREAM
#1 Rehabilitation	47.3 tons
#2 New suburban construction	182.4 tons
#3 Demolition and duplication	351.8 tons

When considered on an indexed basis, the Materials Flow calculations can be represented as in this chart:



Life Cycle Assessment

Life Cycle Assessment (LCA) assesses a product's environmental performance over its full life cycle. Environmental performance is measured in terms of avoided impacts, or minimizing energy and resource use.[31] Some examples of avoided impacts include:

- Fossil fuel depletion
- Other non-renewable resource use
- Water use
- Global warming potential
- Stratospheric ozone depletion

[31] Wayne Trusty, "Renovating vs. Building New: The Environmental Merits" (Merrickville, Ontario, Canada: Athena Sustainable Materials Institute, 2003), accessed June 23, 2013, http://nshistoricplaces.ca/conservation_resources/documents/RenovsBuildNewTrusty.pdf.

- Ground-level ozone (smog) creation
- Nutrification/eutrophication of water bodies
- Acidification and acid deposition (dry and wet)
- Toxic releases (e.g., harmful pollutants and carcinogens) to air, water, and land

The LCA of a building would be calculated using an EcoCalculator® or similar software system to determine what the overall avoided environmental impacts would be for a number of design alternatives.[32] The Athena Sustainable Materials Institute conducted an investigation on the reuse potential of four separate buildings.[33] In all four instances, the strategy to reuse and rehabilitate the buildings proved to be more environmentally advantageous than the raze-and-replace alternative.

Applying LCA to a building is difficult due to the many components involved in construction. Still, the Preservation Green Lab of the National Trust for Historic Preservation noted: "It takes 10 to 80 years for a new building that is 30 percent more efficient than an average-performing existing building to overcome, through efficient operations, the negative climate change impacts related to the construction process."[34]

Preservation of Open Space

Through the preservation and reuse of buildings, communities can offset growth pressures on open lands. Similarly, vacant urban lands or underutilized parcels such as parking lots could hold new construction that takes advantage of existing infrastructure. A study funded by the EPA estimated that redeveloping one acre of brownfields is equivalent in environmental impact to preserving 4.5 acres of open space.[35] Brownfields redevelopment is particularly relevant to urban areas, but it can also be applied in smaller communities and rural towns. In fact, it helps ease growth pressures so that open lands in rural areas can be preserved for agricultural and recreational uses.

Public Health Impacts

In helping to preserve open lands, preservation of buildings also brings a public health benefit. Preventing suburban sprawl helps reduce driving, along with its associated environmental and health costs. Conversely, creating an urban environment in which walking is a pleasant experience has significant public health benefits.

In urban areas, building preservation and brownfields redevelopment can help avoid further increases in vehicle miles traveled (VMT). More intensive use of existing built areas leads to a greater concentration of activities. This encourages both residents and visitors to get out of their vehicles and walk to multiple destinations. National research has correlated walkable communities with higher levels of exercise and lower levels of obesity and body mass index.[36]

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[32] EcoCalculator is a free software system developed by the Athena Sustainable Materials Institute. Additional information is available at http://www.athenasmi.org/our-software-data/ecocalculator.

[33] Athena Sustainable Materials Institute, *A Life Cycle Assessment Study of Embodied Effects for Existing Historic Buildings* (2009), accessed June 24, 2013. http://www.athenasmi.org/wp-content/uploads/2012/01/Athena_LCA_for_Existing_Historic_Buildings.pdf.

[34] Preservation Green Lab, "The Greenest Building: Quantifying the Environmental Value of Building Reuse" (National Trust for Historic Preservation, 2012), 76f.

[35] Jonathan P. Deason, George William Sherk, and Gary Carroll, *Public Policies and Private Decisions Affecting the Redevelopment of Brownfields: An Analysis of Critical Factors, Relative Weights and Areal Differentials* (U.S. Environmental Protection Agency, 2001), accessed June 23, 2013, http://www.gwu.edu/~eem/Brownfields/.

[36] Lawrence Frank et al., "Linking Objectively Measured Physical Activity with Objectively Measured Urban Form: Findings from SMARTRAQ," *American Journal of Preventative Medicine* 28, no. 2S2 (2005), 117-125; R. Ewing et al., "Relationship between Urban Sprawl and Physical Activity, Obesity and Morbidity," *American Journal of Health Promotion* 18, no. 1 (2003), 464-474; Lawrence Frank, Martin Andresen, and Tom Schmid, "Obesity Relationships With Community Design, Physical Activity, and Time Spent in Cars," *American Journal of Preventive Medicine* 27, no. 2 (2004), 87-96.

A reduction in VMT also has public health impacts at the community scale. The Utah Department of Environmental Quality estimates that 57 percent of greenhouse gas emissions in the state come from mobile sources such as automobiles and trucks, so reducing VMT can have a direct positive impact on public health conditions.[37] For example, in early 2013, prolonged thermal inversions in Utah's northern valley posed a threat to public health due to reduced air quality. Reducing VMT—and the pollutants that make up the smog associated with these inversions—can reduce the occurrences of asthma and other respiratory problems.

MAKING HISTORIC BUILDINGS MORE ENERGY EFFICIENT

The building envelope and mechanical, electrical, and plumbing systems are the elements most often targeted for energy efficiency upgrades. This section compares options for retrofitting and replacing building elements and systems.

Building Envelope

The energy performance of the building envelope (windows, doors, walls, ceilings and roofs, and floors) can be improved through weatherization and increasing or controlling the admission of natural light. Replacement windows and insulation are two common modifications to the building envelope.

Replacement windows

Since heated air naturally rises, the amount of conductive energy lost through windows is lower than heat lost through other parts of the building envelope, such as under-insulated attics and roofs. Consequently, many building scientists and energy auditors recommend installing storm windows and weatherstripping, caulking around openings in the building envelope, and sealing openings leading to or from unheated spaces like attics, basements, and stairwells.

In economic terms, one-for-one replacement of wood windows with more efficient vinyl units is not cost-effective. In terms of simple payback—the period of time it takes for energy savings to recover the additional cost incurred when choosing a more expensive alternative—the most cost-effective solution is to add a storm window to an existing single-pane window unit (Table 5). This modification costs $50 and takes less than 4 years to pay back via energy savings. New double-pane windows, the often-advertised alternative, take 34 to 40 years—or more—to pay back. And because the average American family moves roughly every five years, the original purchaser may not realize any cost savings at all.

Table 18

PAYBACK ANALYSIS FOR WINDOW UPGRADE OPTIONS[38]

OPTIONS	COST ($)	R-VALUE	ANNUAL BTUS SAVED	ANNUAL COST SAVINGS ($)	PAYBACK PERIOD (YRS)
Original Window (OW)	------	0.9	0	0	0
OW + storm window	$50	2.0	722,218	13.20	3.8
Double pane	$450	1.7	625,922	11.07	40.5
Low-e double pane	$550	2.9	902,722	16.10	34.0
Low-e double pane for OW + storm window	$550	2.9	132,407	2.29	240.0

SOURCE Keith Haberern, Collingswood (NJ) Historic District Commission. Cited in Noelle Lord, "Embracing Efficiency," Old House Journal 35, no. 5 (September/October 2007), 43.

[37] Utah Department of Environmental Quality, "Emission Sources of Winter PM 2.5," last modified February 27, 2013, accessed February 28, 2013, http://www.deq.utah.gov/FactSheets/sources.htm.

[38] The R-value refers to the ability of a material to resist heat flow. Materials with higher R-values resist heat flow better than materials with lower R-values. A BTU (British thermal unit) is a measure of heat energy. The BTU is used to define a common basis for all heat lost or gained in a building regardless of the fuel source used to overcome the heat loss or gain. One BTU is the amount of energy needed to raise one pound of water 1° F.

Furthermore, recent research indicates that the useful life of vinyl windows is lower than manufacturers' claims. Thirty percent of vinyl replacement windows are replaced within just ten years.[39] Unlike wood windows, individual components of vinyl windows cannot be repaired when damaged and must be completely replaced. And despite the 15- to 20-year warranties offered by manufacturers, some manufacturers may be out of business before the life of the warranty ends.

With any of the vinyl replacement window options, the payback period exceeds the expected life of the window. In contrast, repairing wood-frame windows has been shown as cost-effective both in terms of initial costs (material and labor) and the ability to replace broken or damaged parts.

Window replacements also raise preservation concerns about how envelope modifications impact historic integrity. When a building is located in a local historic district, the local historic landmarks commission may have requirements for preserving original windows and/or selecting new windows. Similarly, if the project is seeking federal historic rehabilitation tax credits, the state historic preservation office (SHPO) will scrutinize the proposed window treatment for compliance with the Secretary of the Interior's Standards. Installation of inappropriate windows may result in the denial of a proposed project or tax credits.

Insulation

The thermal efficiency of the building envelope is a major concern for many building owners. Sealing air infiltration paths—e.g., putting weatherstripping and gaskets around doors and windows—can reduce infiltration and heat exchange significantly. Likewise, insulating the attic will suppress the natural upward flow of heat.

Walls are the final opportunity for insulation upgrades. However, adding insulation to the interior face, the exterior face, and within the interior cavity presents various problems. Insulating the interior face reduces occupied space and can compromise original surface details such as woodwork, ornamental plaster, and paint finishes. Insulating the exterior face can significantly alter the exterior appearance, which may be historically significant. And adding insulation to the wall cavity can create moisture problems. In fact, in all three instances, adding insulation can lead to condensation inside the wall and freeze-thaw related problems toward the exterior of the wall. Consultation with an insulation specialist is advised before starting any insulation upgrades to ensure that potential moisture issues are addressed as part of the upgrade.

Mechanical, Electrical and Plumbing (MEP) Systems

Many MEP upgrade projects involve replacing less efficient components (e.g., burners, motors, pumps, incandescent lamps) with more efficient replacements. Additional strategies to improve sustainability performance include:

- Digital controls: These include programmable thermostats for residential buildings and energy management systems for commercial, retail, institutional, and industrial buildings.
- Enhanced air circulation and free cooling: Nighttime free cooling can flush heat out of a building during the evening when outdoor temperatures are cooler. That outdoor air is used to cool the building.
- Heat pumps: Geothermal heat pumps enhance thermal comfort without creating a significant visual or spatial disruption to the building or its surroundings.[40]

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[39] National Trust for Historic Preservation, "Historic Wood Windows: A Tip Sheet from the National Trust for Historic Preservation" (Washington, DC: 2009), 2.

[40] At approximately 12 feet below ground, the soil temperature is relatively constant year-round and is approximately the average annual air temperature. A ground-coupled heat pump is a mechanically based system that rejects heat into the ground when cooling is needed and absorbs heat from the ground when heat is needed. For more information on this technology, see http://energy.gov/energysaver/articles/geothermal-heat-pumps.

- Raised floor air supply: This technology has been successfully used nationwide to integrate new HVAC systems into industrial and warehouse facilities being repurposed for office and residential uses.[41] One example is the IRS Operations Center in Ogden.
- Photovoltaic panels: These panels transform solar energy into electricity, but they can be visually obtrusive. The former Stratford Hotel in Salt Lake City provides a good example of how to successfully conceal them.
- Low-flow plumbing fixtures: A wide variety of products has been introduced to reduce water demand, including low-flow faucets and showerheads, low-flow and dual-flush toilets, and waterless urinals.

Daylighting interior spaces with skylights, clerestories, and transom windows was a common design strategy before the advent of modern lighting technology such as the fluorescent light. Modern projects are now revisiting the use of natural light as a significant contributor to saving energy and enhancing occupants' emotional wellbeing and productivity. Digital technology can be used to reduce or turn off electric lighting when daylight meets occupant needs.

The broader preservation concern with MEP-related energy upgrades stems from the physical disruption and visual impact of piping and ductwork, especially on the interior finishes and spatial qualities of historically significant spaces. These elements must be routed to avoid compromising the visual and physical qualities of the spaces involved. Historic rehabilitation tax credit projects strongly discourage the installation of mechanical equipment, solar panels, and photovoltaic panels in locations visible from a public right-of-way.

RETROFIT EXAMPLE: G. H. SCHETTLER HOUSE

The G. H. Schettler House in Salt Lake City—discussed earlier as the subject of a material flows study—was rehabilitated in 2000. Constructed in 1904, the two-story single-family brick house is located in locally and nationally designated historic districts. In the recent rehabilitation, mechanical, electrical, and plumbing systems were completely replaced; deteriorated plaster on the interior walls was replaced; and all interior finishes were restored or upgraded. Other improvements included:

- Weatherizing windows and doors,
- Adding attic insulation,
- Replacing the roof,
- Upgrading bedroom windows to meet fire and life safety codes, and
- Installing high-efficiency appliances, low-flow plumbing fixtures, and programmable controls for the HVAC system and exterior lighting.

These enhancements reduced heating loads by 37 percent and cooling loads by 22 percent. The project was a Utah Historic Preservation Tax Credit project that was reviewed by the local Historic Landmark Commission, the State Historic Preservation Office, and the National Park Service for adherence to local design guidelines and the Secretary of the Interior's Standards for Rehabilitation. The total rehabilitation costs were $215,000 ($84/sf); the Utah Historic Preservation Tax Credit reduced the cost to $173,200 ($68/sf). As this was an owner-occupied property, the Federal Historic Rehabilitation Tax Credits were not available.

[41] A raised floor system is one where the walking surface is constructed several inches or more above the floor slab. In the space between the floor and the slab, wiring, communication cabling, and heating and cooling distribution networks are installed to provide service to individual workstations and cubicles. This process allows flexibility in arranging workspaces without the visual and physical clutter that occurs when these services are provided from the ceiling. For more information on this technology, see www.ufad.net/GSAGuideonRaisedFloor2_1.pdf.

WALKABILITY

Recent urban research has demonstrated the importance of "walkability" for quality communities and for public health, transportation, and other reasons. In 2008, a group of Seattle software developers created an online system that measures the "walkability" of neighborhoods and addresses. They make the case for walkable neighborhoods as follows.[42]

Walkable neighborhoods offer surprising benefits to the environment, health and finances, and communities:

- Environment: Cars are a leading cause of climate change. Your feet are zero-pollution transportation machines.
- Health: The average resident of a walkable neighborhood weighs 7 pounds less than someone who lives in a sprawling neighborhood.
- Finances: One point of Walk Score is worth up to $3,000 of value for your property.
- Communities: Studies show that for every 10 minutes a person spends in a daily car commute, time spent in community activities falls by 10%.

They define a walkable community as having:

- A center: Walkable neighborhoods have a center, whether it's a main street or a public space.
- People: Enough people for businesses to flourish and for public transit to run frequently.
- Mixed income, mixed use: Affordable housing located near businesses.
- Parks and public space: Plenty of public places to gather and play.
- Pedestrian design: Buildings are close to the street, parking lots are relegated to the back.
- Schools and workplaces: Close enough that most residents can walk from their homes.
- Complete streets: Streets designed for bicyclists, pedestrians, and transit.

WALK SCORE RATING DESCRIPTION
90–100 Walker's Paradise — Daily errands do not require a car.
70–89 Very Walkable — Most errands can be accomplished on foot.
50–69 Somewhat Walkable — Some amenities within walking distance.
25–49 Car-Dependent — A few amenities within walking distance.
0–24 Car-Dependent — Almost all errands require a car.

As part of the analysis for this study a Walk Score was calculated for every Salt Lake City property that utilized the Utah Historic Preservation Tax Credit, over 900 addresses, and compared those scores with the Walk Scores for Salt Lake as a whole. The comparison can be seen in Table 19.

[42] Walk Score, http://www.walkscore.com/walkable-neighborhoods.shtml.

Table 19

WALKABILITY IN SALT LAKE CITY			
SCORE	CATEGORY	TAX CREDIT PROJECTS IN HISTORIC DISTRICTS	CITY OF SALT LAKE (OVERALL)
90-100	Walker's Paradise	3.1%	
70-89	Very Walkable	41.6%	21.4%
50-69	Somewhat Walkable	51.4%	48.6%
25-49	Car Dependent	3.9%	30.0%
0-24	Car Dependent	0.0%	

Walkability is important on the regional environmental level by reducing vehicle miles traveled and the corresponding effect on air quality. It also has direct benefits for individuals. The American Journal of Preventive Medicine reported, "Neighborhoods built a half-century or more ago were designed with 'walkability' in mind. And living in them reduces an individual's risk of becoming overweight or obese."

The LDS Doctrine and Covenants directs church members to "be diligent in preserving what thou hast, that thou mayest be a wise steward" (D&C 136:27). "And the benefits shall be consecrated unto the inhabitants of Zion and unto their generations" (D&C 70:8).

When written, that stewardship probably referred to the land and water and the production of the early pioneers. But today Utahns are being wise stewards of their historic built environment, preserving those benefits for future generations and practicing sustainable development at the same time.

CONCLUSIONS

Sustainable design is typically measured by how a building is sited or how a community is designed to mitigate sprawl and its attendant environmental degradation. Overall, however, consideration should be given to the relationships between LEED ratings, the energy utilization index, embodied energy, material flows, life cycle assessment, public health impacts, the preservation of open lands, and walkability. As discussed in this section, many older buildings and neighborhoods already have characteristics that are highly valued in contemporary design for their contributions to sustainability. These design elements are being rediscovered by architects for both new construction and reuse projects. Society needs to recognize that preservation and reuse is an effective sustainable design strategy that should be considered at the start of each discussion about future building plans.

Beyond residential and commercial buildings, many of the older buildings being rehabilitated today are industrial and warehouse buildings with large open floor plans. The openness of these spaces meets the needs of large open office plans or can be easily subdivided into smaller retail or residential units. At the scale of multifamily housing, buildings can be repurposed to accommodate a variety of market sectors ranging from affordable to high-end. All these project types have proven to be successful nationwide and are gaining in popularity. As architects, developers, and building managers become more familiar with the processes, the social, environmental, and economic opportunities presented through the preservation and reuse of buildings will become even more attractive to a larger market.