Energy, Water, and Waste at the Building Scale

CONCEPTUAL STRATEGIES

While energy, water, and waste strategies at the district-scale often result in tremendous sustainability improvement, building scale strategies can be "low-hanging fruit." Often simple improvements to buildings can vastly improve energy, water, and waste performance without having to spend a lot of money. Other, more costly improvements can also be made, yielding even better performance.

Currently, existing federal buildings in the study area are not energy or water efficient due to their design and antiquated infrastructure systems. When possible, the federal government is making improvements such as installing low flow fixtures and energy efficient lighting. These measures save money and resources; however, to meet the energy, water, and waste targets (described in the following sections) greater improvements will need to be done in the future.

An important part of the development of the revitalization scenario was modeling individual buildings and sites. The conceptual modeling for the individual buildings identified a potential 47 percent reduction in energy use with a light rehabilitation (upgrading controls and lighting) of existing buildings. Fully rehabbed or new buildings can expect to see on average a 72 percent reduction in energy use from the existing buildings.

The modeling considered how much water, waste, and energy would be used in each building, street, or open space. The modeling also identified different sources of power, heating, and cooling to be supplied across the district. Through this we could estimate the cost of improvements and their value meeting the Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance The matrix on this page provides the guidelines for building improvements.

DESIGN STRATEGIES AT THE BUILDNG SCALE

	Building Strategy				
	Light Rehab	Full Rehab	Repurpose	Infill	Redevelop
Energy					
Tenant Improvement					
Lighting System Upgrade	X	X	X	X	X
Plug Load Reduction	X	X	X	X	X
Sustainable and Certified Materials	X	X	X	X	X
Radiant Heating and Cooling		X	X	X	X
Low Volume Air Distribution		X	X	X	X
Core and Shell					
Upgrades to building systems during natural cycle of obsolescence.	X				
New Mechanical and Electrical System - Hydronic thermal energy distribution.		X	X	X	X
High performance building envelope		X	X	X	X
Maximize the use of renewable energy resources (PV) and shared energy technology		X	X	X	X
Maximize building energy use efficiency		X	X	X	X
Capitalize on Ground Source Heat Below Building Site				X	X
Capitalize on Ground Source Heat Below Open Space and Streets					X
Water					
Replace plumbing existing fixtures with high efficiency fixtures	X	X	X		
Install high efficiency fixtures		X	X	X	X
Collect rainwater		X	X	X	X
Install non-potable water system		X	X	X	X
Waste					
Provide waste sorting stations at point of use locations.	X	X	X	X	X
Reclaim, recycle, and compost the majority of waste (solid and organic) generated within the area.		X	X	X	X
Minimize construction waste.		X	X	X	X