Community Planning and Development
Planning Services

201 W Colfax Ave, Dept 205
Denver, CO 80202
p: 720-865-2940
f: 720-865-3056
www.denvergov.org/planning

To: Zoning Code Task Force
From: Zoning Code Technical Review Team, Community Planning and Development
Date: November 12, 2008 (Updated January 8, 2009)
Subject: Denver Staff Evaluation of Farr Associates Sustainability Audit

Introduction

This memo summarizes Staff's evaluation of the Sustainability Audit prepared by Farr Associates. The audit compared sustainable development best practices with Denver's zoning code and made recommendations for potential additions to the zoning code. An overview of Farr Associates' Sustainability Audit was presented to the Zoning Code Task Force on September 25, 2008. Staff evaluated the various recommendations in the Sustainability Audit with respect to other Zoning Code Update objectives to provide the Task Force with a more balanced framework from which to confirm drafting direction.

Relevant Problem Statement

The framework for evaluating all elements of the Zoning Code Update is the Problem Statements established by the Zoning Code Task Force. The following problem statement was the impetus for the Sustainability Audit:

- Current land use codes and regulations do not advance the proactive implementation of Blueprint Denver and other adopted City plans…. Regulation changes to consider addressing this problem statement…[include regulations that would] remove barriers to sustainable development practices and create standards that protect public health and the environment and that implement Greenprint Denver.

How the Zoning Code Update Supports Denver's Sustainability Goals

Greenprint Denver recognizes three components of "sustainability" that must be balanced to achieve a healthy and vibrant Denver: (1) Economic; (2) Social; and (3) Environmental. All three components must be addressed and balanced to achieve a more sustainable Denver.

With its primary objective to align Denver's land development regulations with the adopted Blueprint Denver land use and transportation vision, the Zoning Code Update inherently is a major sustainability initiative. To this end, the code update will direct the bulk of future population density and economic growth to "areas of change," where Denver's leaders – after significant public participation during the adoption of Blueprint Denver – determined made the most sense economically, socially, and environmentally.

In addition, and more specifically, the form-based and context-sensitive approach to the Zoning Code Update will advance sustainability goals by:

311 for City Services
Denver gets it done!

- Advancing efficient land consumption and the leveraging of public investment by enabling population densities in Denver's core and central neighborhoods, as well as in "areas of change" such as major transit corridors.

- Encouraging the reuse of and reinvestment in existing buildings by prescribing more context-specific parameters to allowable building form and intensity, and proactively remapping to implement Blueprint Denver and other adopted plan visions. The combination of context-based standards and alignment of zone district mapping with adopted plans would temper the tendency of zoning in some stable Denver neighborhoods to encourage demolition of existing building stock to construct bigger buildings that maximize the allowed building envelope.

Specific Strategy Recommendations to Further Support Denver's Sustainability Goals
While Farr Associate's Sustainability Audit recognized the "big picture" sustainability gains to be made through a form-based and context-sensitive zoning code, the Audit primarily focuses on more specific sustainability measures Denver might consider folding into its various land development regulations.

The table on the following pages organizes the Sustainability Audit's specific regulatory recommendations into the following five categories. The Zoning Code Task Force should review the table and confirm staff's recommended action at its December 10, 2008, meeting:

(1) Sustainability measures already found in Chapter 59 (Zoning) that will be carried forward into the new code, either "as is" or with modifications as recommended in the Sustainability Audit.

(2) New sustainability measures that will be incorporated into the updated code. This category of measures has no apparent conflict with other code objectives or the form- or context-based code approach.

(3) New sustainability measures that staff will study further and will incorporate into the updated code if CPD finds the new measures do not conflict with other code objectives or with the form-based and context-sensitive approach.

(4) Proposed sustainability measures that staff recommends not be included in the updated code because such measures are contrary to past policy decisions or raise significant zoning administration and/or enforcement challenges that outweigh the relative benefits.

(5) Proposed sustainability measures that must be implemented through the lead of a city agency other than CPD. These recommendations provide CPD with future partnership opportunities to advance sustainability objectives outside the zoning code update project.

Staff Recommendations for Incorporating Sustainability Audit Measures Into Zoning Code Update

Category	Description	CPD Comments
Buildings, Land Use & Neighborhoods – Create and preserve walkable, complete neighborhoods	**Strategies Existing In Current Code That Continue**	
	▪ Detached and attached Accessory Dwelling Units (ADUs) allowed in Mixed Use Zone Districts ▪ Inclusionary Housing Ordinance ▪ Variety of home occupations allowed ▪ Minimum building height required in MS-3 zone ▪ Variety of "light" industrial uses allowed in same district as residential uses	
	New Strategies To Include In Zoning Code Update	
	Density – Transit Oriented Development	▪ When adopted plans support ▪ Residential development on lots smaller than 6,000 s.f. allowed
	Housing – Diversity, accessory units, private outdoor space	▪ ADUs when consistent with established or desired neighborhood character; maximum 1 detached ADU for each primary single-family house.
	Commercial – mixed uses, walkable, community spaces	▪ Consistent with ZCU approach
	Mix of uses – daily retail, services, civic convenient to most households	▪ Consistent with ZCU approach and mapping to implement Blueprint Denver
	Jobs – variety within close proximity to residential, home occupations, eco-industrial	▪ Small-scale, low-impact industrial uses already mixed with residential in C-MU-30 zoning – will be part of revised industrial districts
	Walkability – creation of walkable blocks during site planning, connections, building orientation	▪ Good recommendations for PBGs ▪ Street-closing prohibition to Public Works
	New Strategies That Will Be Incorporated If Confirmed By Further Study	
	Minimum densities within a walkable neighborhood to support neighborhood commercial and transit	▪ Consistent with Blueprint Denver growth management objectives to concentrate growth and mix uses to improve quality of life.
	Adaptable – accessible (universal) housing	▪ Mayor's Task Force on Aging is investigating housing needs for an aging population, including accessible housing. ▪ Some universal design provisions, such as no-step home entries, may conflict with context sensitive building form standards.
	Continuous backyard space	▪ Consider when review context and building form standards; incorporate when consistent with established or desired neighborhood character.

Staff Recommendations for Incorporating Sustainability Audit Measures Into Zoning Code Update		
Category	**Description**	**CPD Comments**
Buildings, Land Use & Neighborhoods (Cont'd)	**Strategies CPD Recommends Not Be Included In Zoning Code Update**	
	Encourage locally based commercial development	▪ Not recognized as priority issue for ZCU; no policy direction at this time. Big-box and national chain retail will be allowed subject to compliance with building form standards to conform to desired built character (e.g., Main Street).
	Require appropriate % of office for jobs in mixed use areas to balance residential levels	
Lighting – Reduce light pollution, enhance enjoyment of night sky, lower amount of wasted energy	**New Strategies That Will Be Incorporated If Confirmed By Further Study**	
	Lighting zones, efficient lighting standards, height limits, pedestrian lighting, nighttime dimming	▪ Need to research past efforts and determine appropriate measures for Denver
	Strategies CPD Recommends Not Be Included In Zoning Code Update	
	Non-residential lighting curfew	▪ Raises significant administration and enforcement challenges
Energy – Facilitate renewable, efficient, and diverse sources of energy to enhance the reliability and power quality of the power grid and reduce peak power demand.	**Strategies Existing In Current Code That Continue**	
	▪ Wind turbines in residential districts – modify as recommended ▪ Wind turbines in commercial districts and multi-family lots – modify as recommended ▪ Solar panels in residential districts – modify as recommended ▪ Solar panels in commercial districts – make clear permitted in all districts	
	New Strategies To Include In Zoning Code Update	
	Allow district generation facilities – geothermal	▪ Define use and expressly permit
	Allow district generation facilities (above-ground structure), with conditions	▪ Define use and expressly allow as conditional use
	New Strategies That Will Be Incorporated If Confirmed By Further Study	
	Renewable district energy facilities incentive = increase densities in areas served by district generation facilities integrated with power grid.	▪ Density bonus through zoning may be at odds with form-based approach, which typically does not rely on maximum FAR or maximum density standards to control intensity of development. ▪ May be more appropriate to address this recommendation through a planning exercise that leads to a change in recommended land use/intensity (e.g., from "single family" to "single family/duplex") based on this investment in capacity-building infrastructure, after which zoning may be updated to implement such plan directive.
	Building Elements– mandates for glazing, shading, and operable windows	▪ May conflict with some context-based zoning, such as minimum

Staff Recommendations for Incorporating Sustainability Audit Measures Into Zoning Code Update		
Category	**Description**	**CPD Comments**
Energy (Cont'd)		requirements for ground-floor transparency ▪ May need to be addressed through Building Code amendments or updates
Solar Access – Provide a reasonable level of solar access to sunlight in order to protect the economic value of solar energy systems and provide for future use of solar energy.	**New Strategies That Will Be Incorporated If Confirmed By Further Study**	
	Solar Readiness -- maximizing solar access to the roofs of primary house and accessory garage to facilitate investment in active solar energy systems	▪ Audit found that in most residential AOS where the variability of building height is not more than 1½ stories, form-based approach results in generally good solar access to the primary house rooftops. ▪ Whenever a 2 or 2 ½ story building is adjacent to a 1 or 1½ story building, solar access will not be guaranteed under the form-based approach (or current bulk plane approach). ▪ The audit recommendations for solar fences, increased side yard setbacks, prohibitions on certain street-facing roof forms, zoning in 2-story increments, and minimum south-facing roof exposure must be considered in light of code goal to be context sensitive. Confirmed by ZCTF @ 12/18/09 special meeting. ▪ Some of these recommendations for the primary structure, such as solar fences or increased side setbacks, may be appropriate in some contexts, such as the suburban and other lower intensity contexts and zone districts, but not in others, such as residential districts in the general urban context. ▪ There may be more flexibility to incorporate the audit recommendations for detached accessory structures, where those structures are not highly visible from the primary street frontage and would not greatly impact established character in AOS.
	Solar Shading – solar access protection from shading by trees	▪ Raises administration and enforcement concerns – will require further research. General consensus by ZCTF at 12/10/08 meeting to NOT incorporate solar shading standards at this time.

Staff Recommendations for Incorporating Sustainability Audit Measures Into Zoning Code Update		
Category	**Description**	**CPD Comments**
Solar Access (Cont'd)	Passive Solar Access Protection – orient buildings built on ends of new N/S blocks within 30 degrees of true E/W	▪ May be appropriate for large-scale greenfield or infill development (e.g., Gateway, Stapleton, Gates), but may conflict with established block/lot/building orientation patterns in many existing contexts, especially in the more dense urban contexts; in addition, ~~and~~ may conflict with citywide goals to connect new streets with the existing Denver grid. ▪ ZCTF members at 12/18/08 special meeting directed that more effort be devoted to addressing passive solar access (access to natural light) to a greater degree than suggested in above bullet. ▪ Be prepared to answer, with code draft, how does form-based approach improve passive solar access? (E.g., the code should prevent barriers to daylight caused by "too close" homes when greater side setbacks, or buildings pushed to north side of lot, are consistent with predominant character/patterns of neighborhood.)
Parking – Reduce excessive parking to maximize land use and promote a pedestrian-friendly and vibrant urban landscape. In dense areas, reduced parking alleviates issues of congestion and air quality caused by excess cars and promotes alternative transportation choices where appropriate	**Strategies Existing In Current Code That Continue**	
	Limit requirements for off-street parking: ▪ Lower requirements for TOD parking in MU zones ▪ Shared parking in MU and other nonresidential zones ▪ Tandem parking in MU ▪ Exemptions or lower requirements in the MS zones for variety of uses and conditions (e.g., pre-1967 existing structures, small lots, affordable housing, SROs, small dwelling units)	▪ Existing provisions provide platform for expanding allowances for reduced, shared, and cooperative parking when consistent with context-based approach
	New Strategies To Include In Zoning Code Update	
	Limit requirements for off-street parking: ▪ Counting of on-street parking toward minimum parking requirements ▪ Cooperative parking ▪ Lower parking requirement with provision of shared car program	▪ Consistent with Blueprint and TOD plans/strategies
	Reduce footprint aspects of off-street parking: ▪ Maximum limits for parking ▪ Bicycle parking spaces for businesses ▪ Bicycle parking spaces for multifamily ▪ Dual use for all surface parking lots	▪ Dual use of lots – some allowances exist already in some zones; look to build/expand off those

Staff Recommendations for Incorporating Sustainability Audit Measures Into Zoning Code Update

Category	Description	CPD Comments
Parking (Cont'd)	▪	
	New Strategies That Will Be Incorporated If Confirmed By Further Study	
	Reduce footprint aspects of off-street parking: ▪ Maximum limits for parking ▪ Reduced size of parking spaces	▪ Apply maximums in contexts/districts where strong policy support: Downtown, TOD station areas, other?
Heat Island – Reduce the urban heat island effect to reduce demands on energy for cooling during hottest months; facilitate more comfortable walking and biking	**Strategies Existing In Current Code That Continue**	
	▪ Tree Canopy: permit for removal of front yard trees ▪ Tree Canopy: protection of front yard trees ▪ Street Trees: Mile High Million campaign ▪ Street Trees: Recommend no evergreens as street trees	
	New Strategies That Will Be Incorporated If Confirmed By Further Study	
	▪ Tree canopy – parking lot tree coverage for shade ▪ Surfaces – require reflective pavement surface on driveways and parking lots ▪ Roof surfaces – require reflective roof surfaces on all buildings with lower allowed on sloped roofs	
	Strategies CPD Recommends Not Be Included In Zoning Code Update	
	Tree canopy: ▪ Existing tree demolition/replacement permit on any part of private property ▪ Tree protection beyond front yard ▪ Tree survival measures ▪ Specimen tree preservation	
Food Production – Provide for the production of fresh healthy food within the city	**Strategies Existing In Current Code That Continue**	
	▪ Raising small farm animals – limited use in residential zones (rabbits, pigeons, doves) – ▪ Beekeeping ▪ Farmers markets ▪ Seasonal retail sales as accessory use to church or religious institution ▪ Temporary farm stands in residential areas ▪ Community gardens ▪ Allow residential vegetable gardens in side yards	▪ Existing provisions will be further refined and may be extended to additional zone districts when consistent with context-based approach
	New Strategies That Will Be Incorporated If Confirmed By Further Study	
	Solar access to backyard gardens	▪ See comments under "Solar Access" above
	Raising female chickens, other fowl, rabbits; raising goats; raising cows, sheep, pigs;	▪ Expansion beyond already-permitted farm animals requires further discussion
	Strategies CPD Recommends Not Be Included In Zoning Code Update	
	Fruit trees in lieu of shade tree requirements	

Staff Recommendations for Incorporating Sustainability Audit Measures Into Zoning Code Update

Category	Description	CPD Comments
Waste Reduction – Reduce the amount of construction waste headed to landfills by recycling and reusing materials and whole buildings	**Strategies Existing In Current Code That Continue**	
	▪ De-couple demolition and building permits ▪ Parking of existing buildings – exemption of existing structures when parking area does not exist; historic structure exceptions; Main Street parking exceptions	▪
	New Strategies To Include In Zoning Code Update	
	Re-use of existing buildings – avoid over-zoning existing buildings with character to retain, which raises property values and encourages demolition of existing building stock for bigger buildings.	▪ The context-based approach and remapping will address this
Water Conservation – Address issues of inefficient, wasteful water use; encourage multiple uses of water prior to release from site via runoff or wastewater systems	**Strategies Existing In Current Code That Continue**	
	Landscape – Xeriscape planting	▪ No barriers exist incurrent code to installation of xeriscape
	New Strategies That Will Be Incorporated If Confirmed By Further Study	
	Landscape – Drip/subsurface irrigation systems only	▪ Apply mandate in new development only
Stormwater – Manage rainwater on-site to extent possible; limit stormwater facilities that do not double-duty as integrated landscaped/open space features	**New Strategies That Will Be Incorporated If Confirmed By Further Study**	
	Limit impervious areas of zone lots – ▪ Landscape all unused parking lot areas; ▪ Limit dimensions of parking spaces/lots; ▪ Reduce driveway paved surfaces; ▪ Limit impervious surfaces in required open areas of lot ▪ Bioswales in parking areas ▪ Zoning incentives for green roof (increased building coverage)	▪ Consider in updated parking lot landscaping standards ▪ Permeable materials for drives – work with Public Works to see if could implement quickly without further study ▪ Recommendations must be considered in light of code goal to be context sensitive; requiring wider parking lot islands to incorporate bioswales may conflict with goals to reduce total land area of surface parking lots – especially in more urban contexts. ▪ Form-based approach disfavors “bonuses” in dimensions or building coverage of allowed building types. May conflict with character preservation goals in some contexts/districts.

Staff Recommendations for Incorporating Sustainability Audit Measures Into Zoning Code Update

Category	Description	CPD Comments

Future Partnership Opportunities

Proposed sustainability measures that are not implemented through zoning, and which CPD finds requires the lead of a different city agency. These recommendations provide CPD with future partnership opportunities to advance sustainability objectives outside the zoning code update project

Department	Recommended Action
Public Works Department	▪ Stormwater – Reduce impervious surfaces – Streets and on-street parking surfacing ▪ Stormwater – Rainwater management ▪ Stormwater -- Green roofs ▪ Vehicle Connectivity – Prohibit cul-de-sacs with exceptions ▪ Water Conservation – Reuse – gray water systems ▪ Waste Reduction – Reuse/Recycling of Demolition Waste
Parks Department	Address Heat Island Effect: ▪ Tree canopy and street tree requirements in ROW ▪ Tree preservation and requirements on private property

CDFM Architectural *165 Madison Street Denver, Colorado 303 355-2302*

Date: 29 Dec 2008

To: Denver Zoning Code Task Force

Re: The Planning Staff Memo on the Farr Audit presented at the ZCTF meeting on Dec 10, 2008.

Under the portion labeled "Solar Readiness" in the staff memo the following comments are offered:

1) Solar access is not exclusively a rooftop issue. There are passive solar gains, day-lighting strategies and quality of life issues to consider as well. Solar access can be protected without negative effects on contextural goals. The comment that solar access recommendations are not appropriate for residential in the general urban context is specious. In most existing Denver neighborhoods, height, setback or bulk restrictions for solar access will actually help achieve better context.
2) Protecting solar access for detached accessory structures is at best a partial solution. Solar access is much more important for occupied structures and more easily accomplished due to the front and rear setbacks which center the primary structures east to west in the site plan.
3) Shading from trees is a difficult subject, but I believe there are reasonable methods that could be applied in the zoning regulations. At least one suburban development in Arvada has such a guideline written into their covenants. Some approach to control tree shading should at least be considered, because trees can produce damaging effects equal to or even exceeding those from buildings.
4) The strategy for passive solar access protection on the ends of new blocks needs to be expanded and applied to all new developments. This could be a design standard that is reviewed during the development review process. It should specify the layout of streets and blocks so that most streets are east-west or nearly so. Also in new developments, solar access easements can be established easily for those sites that may not face E-W streets. Such "solar subdivisions" would develop their own context naturally. There are also examples of this type of design standard on the books in other states and municipalities around the country.
5) Continuation of the existing Denver grid which is primarily N-S will perpetuate the solar access problem that now exists. Neighborhood layouts similar to those found in Virginia Village should be pursued as more friendly to solar access.

Richard R. Heinemeyer, AIA