

Green Roof Review Task Force
Meeting #4 – March 1, 2018 – 12:30-3:30
200 W 14th Ave, 2nd Floor, Grand Mesa Room

Meeting Objectives:

- Examine the Framework for a Performance-Based Revision to the Ordinance
-

12:30 Opening

- Welcome – Opening – Introductions – Preliminary Matters – Agenda Preview and Operating Protocol Reminder
- List of Subtopics to Track
- Communication as Everyone Fields Requests for Information

12:40 Process Check – We Want to Ensure that We’re Not Narrowing Too Soon – One Option We Haven’t Discussed – Ordinance Revisions – Should Staff Prepare This Option?

12:55 Two Matrices – Existing Buildings (1:25-2:30) and New Buildings (2:30-3:15)

Presentation

Q&A

Discussion

- Reactions to the Overall Approach
 - Does this approach retain the benefits of the ordinance? How does it, or in what ways does it fail to do so?
 - Does this approach have the possibility of improving acceptance of and support for the ordinance? If so, how? If not, why not?
 - Does the approach respond to the concerns over the cost of implementation? If so, how? If not, why not?
 - How would you make this approach more effective?
- Reactions to Specific Elements
 - Are the right strategies included? If not, what’s missing?
 - How should the point system work?
 - Does the distinction between existing and new work? If not, why not?

2:45 What data and scope of work do you need from Stantec and other experts to finalize and fill in the matrix?

3:20 Next Steps – Meeting #5 – Wednesday, March 21 – 9:00 – noon

3:30 Adjourn

Green Roof Review Task Force
Summary – Meeting #4 – March 1, 2018 – 12:30-3:30
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Meeting Objectives:

- Examine the Framework for a Performance-Based Revision to the Ordinance
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I. Process Check

Have we moved too quickly to one option that would replace the ordinance, or should the staff take on the task for revising the current ordinance? Discussion:

- Hearing from those interested in what we're doing that the path we're on is promising
- Promising, but we should not close off the possibility that the final answer lies elsewhere, so we should stay open to other ideas
- It is worth seeing it through, worth investigating the matrix approach
- It is important to be skeptical – if this approach doesn't get at what the ordinance is about; the ordinance is green roofs and solar
- We might consider the possibility of offering the matrix as an option in place of the waiver which strengthens the original ordinance
- The matrices are a viable option, but ultimately, that conclusion lies in the details; they need work
- The matrices are promising because they could incorporate improvements in technology over time
- The matrices allow for variation in building type

The group agreed to consider this question again at the end of today's meeting – as the details of the matrices become clearer.

II. Matrix – Existing Buildings – Discussion

Q: Where did air quality go?

A: The data show the likelihood of both minor positive and minor negative implications for air quality; the matrices focus on what the data show are significant benefits of the ordinance, so air quality is not a part of this draft; there is a group meeting March 9th for some who want to explore the data further; any interested member of the task force is welcome

- Cost impacts are missing
- We should consider removing existing buildings altogether
- We could implement this approach starting with new buildings and delay the start of the ordinance for one year for existing buildings
- The biggest benefit of the ordinance will come from applying it to existing buildings; it is better to have the matrices allow alternatives; owners of existing buildings can do things, many of them small things, that realize the benefits of the ordinance
- There are so many different buildings; we need to consider how each will fit into the matrices
- It is important to keep in mind that the benefits of the different strategies happen on very different time scales; some take a long time; delaying implementation will delay the benefits
- The issue with existing buildings is cost
- Owners are going to repair and repair their roof to avoid replacement that triggers the ordinance
- We do need to understand the costs – we should categorize the options according to costs, perhaps five levels of cost; and we should look for those things that have low cost and high benefit, those that have high costs and extraordinary benefits, and help building owners avoid high-cost-low-benefit options
- We can let building owners choose what's best for them; we have to ensure that the matrices have the right content so that those choices work

- There are ways to make sure that the ordinance encourages cost-effective options
- Insurance and hail events – we need to understand how insurance policies are implicated in our work
- It would be interesting to consider whether a building owner can accrue points over time for building improvements. Points can be earned over time perhaps in existing buildings
- We need to be sure that the matrices work for different building types – retail, industrial, large-roof low-rise buildings (retail and industrial buildings) and very tall buildings with very small roof areas (high-rise offices)
- Some of us are talking about costs and down-playing benefits; others are focused on benefits and down-playing cost; this is an opportunity to add flexibility in hopes of both realizing the benefits and helping those who have to pay the costs
- We have to be careful not to let concerns cause us to move backwards on climate
- It is concerning that some of the beneficial changes that buildings could make on climate are, in the matrices, now tied to roof replacement; roofs last a long time, and with repairs, we lose time; roof replacement might be the wrong trigger
- A lot of the existing buildings wouldn't require a green roof; so, maybe they don't need to get everything in every column as long as we are still getting benefits
- Maybe we exclude hail damage as a trigger
- We need to create something realistic
- Perhaps we reconsider the measurements – floor area instead of square footage
- Quick paybacks are where we should start; for example, energy audits are a good place to start – quick payback and useful for existing buildings
- We need to consider the definition of “roof replacement”; we can look at how the ordinance is applied today – there are real projects under review now; one recent project will get the major alteration exemption, and another is required to comply with a green roof
- We want eager compliance; when we are making rules, we need to make it easy. Including for those who are reviewing permits and enforcing ordinances
- Yes, eager compliance should be our goal, and that's possible; encouraging real white roofs (not white paint, but real, insulated, high-reflective roofs) could make for more eager compliance
- Can we stagger improvements over time so that building owners are not facing all costs at once?
- Denver has benchmarking, getting commitments to improving your score over time makes sense to consider. Since it is an annual public database, there is accountability and enforcement.
- We want a more sustainable city and need to help get existing buildings there
- Retro-commissioning is one of those strategies that has a quick payback for existing buildings
- It is better to look at pay-back, not just cost – how quickly do improvements pay back in energy savings
- Five different categories of cost
- The ordinance will have to speak to how we track the points
- Xcel can provide incentives, but incentives are targeted at things that aren't mandated; if something is required, Xcel shifts its incentives to something else; if there are options, Xcel can still offer incentives
- Existing buildings could have the same matrix, but be required to get fewer points
- We should remove “with REC's” from the matrix; REC ownership is technical and complicated
- We need to redefine “available roof space” to clarify how the term considers HVAC equipment and access areas
- PACE isn't a stand-alone option, it's a way of financing all options, so perhaps we can remove it from the matrix
- We could consider separately the photovoltaics/solar from the green roof – take them as two distinct questions to simplify our approach to the ordinance – different questions, different timelines

- We do need an insurance discussion
 - We could discuss adding Energize Denver 2.0
 - The new buildings are easier to deal with; more flexibility; the architects and owners have more choices
 - Time of implementation and time of payback needs to be considered together
 - Requirements need to be tied to the location – off-site needs to be near – heat island improvements are local
 - For new buildings, solar and energy measures can be considered from the beginning; for existing buildings, different sites might have different cost-effective strategies one would select first or second to address climate and energy efficiency
 - The shading in the matrices is helpful; now that we have the background we may want to look at simpler layouts – Christine will send those she’s seen so they can be distributed to the task force
 - There is living architecture performance tool and a webinar online; it is helpful in weighting this; we will send the link
 - If we decide that buildings have to earn some points in each category, we could allow for an owner to focus on fewer categories if they go beyond the required point total
 - We don’t want to punish those who have already made energy efficiency improvements to their building
 - Chicago allows for base points for LEED-certified buildings, for example
 - Maybe we are talking about different matrices for different types of buildings or different point totals for different buildings
 - We need to begin looking at the points
- Q: How does the group want the draft points added in? Stantec? Other experts?
- Q: Can we use that as a baseline?
- Q: Can we hear from those implementing in Chicago about what’s working and what they would change in their own ordinance?
- A: Stantec did ask them that question before presenting their approach; they are open to continuing to help us
- A: We do need a first draft of the points from Stantec and staff

III. Matrix – New Buildings – Discussion

- Q: How does the builder benefit if they then sell it?
- A: PACE financing would be a great way – the remaining costs and energy savings transfer to the next owners and also flow through to tenants in common triple net leases (same as existing buildings)
- The ordinance allows an owner to maximize solar; given that, we could release an owner who selects maximum solar from a requirement in the green space column
 - We can give points for green space on the ground and relieve the owner from being required to put the green space on the roof
 - Green space is not the same as amenity space – the matrix distinguishes between space that people can access and a green roof that is not accessible or visible
 - If the green experience is important we should talk about ground level
 - It makes sense that visible or usable green spaces get more points; it has more benefits to people
 - It doesn’t make sense to give more points because the heat island and water benefits are not necessarily higher for these
 - We could give a bonus for it being visible – or not

- Off-site green space and ground level green space are in the matrix, so we are creating those options; next, we have to decide how many points these different options can get and whether we give the same score to accessible and inaccessible green roof
 - Maybe it's a good place to create some compromise – some people have said that the cost is easier if built on the ground, and people can use it without extra cost of making the roof safe to use
 - We can make these choices more easily for new buildings – we just need options
- Q: Does the ordinance say anything about access to the green roof?

A: No

- San Francisco has a program where building owners make roof-top space available to workers and to the public and put a plaque on their building to tell people that they have accessible space; they get incentives for doing that; other cities do this as well
- Existing planter boxes on amenity spaces could get credit for existing buildings
- Any rooftop – even one that is not at the very top of the building but is part of a setback at an intermediate height – is considered roof and would count as green roof if planted
- The designers of new buildings should be allowed to get creative
- We should look at if the ground level is an option and allow for green space equal to what you would have to put on the roof; then maybe you get more points if it is accessible
- The space has to be low-water
- A benefit to ground level you can incorporate stormwater

IV. Data Needs – Stantec

- We need to have the draft point system done by experts
- We need ideas for applying this to campuses or districts that can share the requirements
- We need to have them link the point systems to the goals we have for the city
- Five groups of cost – very high, high...

Q: How do you want costs, net present value, capital costs, sqft costs, life-cycle costs...?

A: Net present value – so every idea is comparable, and the dollars are brought back to present value

- This is data for us, not something that goes in the matrix – the real costs for real projects, we have to allow owners to work out for themselves, so they can make their own choices about which strategies to use to get their point total
- Understanding ranges of cost will help us have confidence in our assignment of the point values
- Useful to know how much more expensive the options are than a non-green solution
- We should consider the difference between office and retail. We also understand that a lot of the ordinance text was based on one from Canada. Is that where the difference came from?

Q: Do you want sample buildings again?

A: Perhaps we come to the next meeting with ideas for useful sample buildings

V. Should the Group's Time and Effort Continue to be Applied Exclusively to Developing the Matrices?

The group agreed that their efforts would continue to be focused on the matrices approach

VI. Adding Scores to the Matrices – Working Groups

- Katrina will start each working group with technical advisors – **All Task Force Members are Welcome**
- Urban Heat Island and Green Space Working Group – Task Force members – Jennifer, Andy, Joe, Kathie. (with non-task-force-members: Austin Troy, Sara Davis, Grant's contact at Civitas,).
- Stormwater Working Group – Jon, Austin (with Urban Drainage and Public Works)
- Climate – John, Katrina, Christine, Grant, Joe, Tyler

VII. Observer Comments and Final Thoughts

Q: Can PACE financing impact FHA qualifications?

A: Possibly – it would be useful to get a reading from the state’s attorney general

- It would be useful to find ways to normalize the benefits in each category – so that there is an equivalency – if you do option A or B it’s about the same level of benefit
- If you create matrices that have an abundance of choices, that may be the best way to create eager enforcement – because everyone can find the things that they want to do, and they make their own choices, so everyone should leave feeling happy; you just need to develop a full list of good choices
- We need to talk about residential buildings separately – we need to consider housing affordability directly

**DRAFT City and County of Denver Green Building Compliance Matrix
New Buildings**

Direct Primary Benefit of Strategy
Likely Secondary Benefit
Potential Benefit

BENEFITS OF ORDINANCE

COMPLIANCE STRATEGIES ON ROOFTOPS	Urban Heat Island	Stormwater Management	Green Spaces	Climate Change
ROOF SURFACES				
Accessible Green Roof				
Non-accessible Green Roof				
Cool Roof (High-Albedo)				
Blue Roof				
Rooftop food production				
On-Site Solar PV with REC's				
COMPLIANCE STRATEGIES OFF ROOFTOPS				
GROUND SURFACES				
Green Infrastructure Stormwater Strategies (See Denver Ultra Urban Green Infrastructure Other Stormwater Strategies (See Urban Drainage and Flood Control Criteria Manual,				
Green Space with tree canopy				
High-Albedo Pavement				
Green walls and hedges				
Green space with grass/ planters				
Ground-level food production				
Financial contribution for off-site green space				
SOLAR AND ENERGY EFFICIENCY				
Exceed Current Energy Code by 15-30%				
Stretch Code				
Living Building Challenge Zero Energy				
Net-Zero Energy per DOE definition				
Net-Zero Carbon per DOE definition				
Off-Site Solar PV with REC's				
SUSTAINABILITY RATING SYSTEMS *points are contingent on which credits are achieved in each rating system, details to be worked out				
LEED-NC Certification (Silver/Gold/Platinum)				
LEED-O&M Certification (Silver/Gold/Platinum)				
LEED Dynamic Plaque				
Enterprise Green Communities				
Passive House				
WELL Building				
Green Globes				
BREEAM-USA				
ENVISION				
SITES				
<i>Other (e.g. PEER, CHPS, STAR)</i>	TBD	TBD	TBD	TBD
WATER, STORMWATER				
One Water (Denver Water definition)				
TOTAL POINTS				

**DRAFT City and County of Denver Green Building Compliance Matrix
Existing Buildings**

	Direct Primary Benefit of Strategy
	Likely Secondary Benefit
	Potential Benefit

BENEFITS OF ORDINANCE

COMPLIANCE STRATEGIES ON ROOFTOPS	Urban Heat Island	Stormwater Management	Green Spaces	Climate Change
ROOF SURFACES				
Accessible Green Roof				
Non-accessible Green Roof				
Cool Roof (High-Albedo)				
Blue Roof				
Rooftop food production				
On-Site Solar PV with REC's				
COMPLIANCE STRATEGIES OFF ROOFTOPS				
GROUND SURFACES				
Green Infrastructure Stormwater Strategies (Denver Ultra Urban Green Infrastructure Guide)				
Other Stormwater Strategies (Urban Drainage and Flood Control Criteria Manual, Volume 3,				
Green Space with tree canopy				
High-Albedo Pavement				
Green walls and hedges				
Green space with grass/ planters				
Ground-level food production				
Financial contribution for off-site green space				
SOLAR AND ENERGY EFFICIENCY				
Energy Star Score 75 or higher				
EUI 15-50% below 2016 baseline				
DOE asset score rating of 7.5-10				
Retrocommissioning or Install Controls so can do RcX in future				
Energy Audit and complete measures under 2.5-10 year payback				
System upgrades more efficient than code				
Living Building Challenge Zero Energy				
Net-Zero Energy per DOE definition				
Net-Zero Carbon per DOE definition				
Off-Site Solar PV with REC's				
PACE financing to pay for all of the above				
SUSTAINABILITY RATING SYSTEMS *points are contingent on which credits are achieved in each rating system, details to be worked out				
LEED-NC Certification (Silver/Gold/Platinum)				
LEED-O&M Certification (Silver/Gold/Platinum)				
LEED Dynamic Plaque				
Enterprise Green Communities				
Passive House				
WELL Building				
Green Globes				
BREEAM-USA				
ENVISION				
SITES				
Other (e.g. PEER, CHPS, STAR)	TBD	TBD	TBD	TBD
WATER, STORMWATER				
One Water (Denver Water definition)				
TOTAL POINTS				