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**MINUTES  
CITY OF FORT COLLINS  
FUTURES COMMITTEE MEETING**

**Date:** November 14, 2016  
**Location:** CIC Room, City Hall, 300 Laporte Ave.  
**Time:** 4:00–6:00pm

**Committee Members Present:**

Wade Troxell, Chair  
Gino Campana  
Kristin Stephens

**City Staff:**

Jeff Mihelich, Deputy City Manager  
Jacqueline Kozak-Thiel, Chief Sustainability Officer  
Tom Leeson, Community Development & Neighborhood Services Director  
Cameron Gloss, Planning Manager  
Laurie Kadrich, Director of PDT

**Invited Guests:**

Bruce Hendee

**Community Members:**

Kevin Jones, Fort Collins Area Chamber of Commerce  
Dale Adamy, citizen  
Myles Crane, Human Rights Commission

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**Wade Troxell called meeting to order at 4:40pm**

**Approval of Minutes:**

Kristin moved to approve the October minutes as presented. Wade seconded. Motion passed unanimously, 2-0-0. Gino arrived after vote.

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**Think Tank Item 11-2016: Architectural Resilience—Bruce Hendee**

- Issues that will impact Council policy decisions.
- Architecture for a changing climate—warming and drying—increased drought
  - Planning/systems approach can mitigate, arrest, or reverse impacts
- Drought: Dry conditions prevail for a period of time. Run out of rainfall and stored water. Defined by impacts. Colorado is semi-arid climate. Half normal rainfall this year.
  - In Fort Collins—frequent and more serious
  - Normal occurrence, historically
  - Extreme heat expected—CO expected to warm 2.5° over 1950 by 2025
  - Predict multidecadal megadroughts to begin by 2050

- Systems approach to create oasis—prepare, anticipate, keep water flow here.
  - Ian McHarg—systems analysis
  - Can local solutions supersede international trends?
  - Tree canopies may help retain moisture—limited research
- Carbon Cycle: most oxygen comes from phytoplankton in ocean and trees on land—take in carbon dioxide from animal and human emissions. Upset balance of carbon and oxygen leads to global warming.
- El Nino/La Nina: weather patterns related to flow of ocean water in the Pacific. Affects Jetstream. El Niño=wetter weather to plains. La Niña=dryer weather. May be extending La Niña with human caused carbon emissions.
- System: landscape, buildings, transportation
  - City=housing, buildings, transportation, electric generation
  - Oxygen generation=unknown
  - Systems approach would look at inputs and outputs. Need ideas for offsets.
  - Reversing the trend: What is role of buildings? Of landscape, open spaces, etc.?
- Architecture trends: cradle to cradle buildings that do no harm (and some good)
  - Living Building Challenge—regenerative architecture (offset negative impacts)
  - 87% of time spent indoors in US; 75% of electricity use
  - Half of water goes to outdoor landscaping; half indoor use
- Living and regenerative buildings add to resiliency
  - Moving toward self-sufficiency in energy, water, and waste
  - Existing buildings will be biggest challenge—retrofits
- Design for resilience. Build to:
  - Withstand drought, heat, wind and dust (future conditions)
  - Work without grid-served electricity
  - Reduce dependency on complex control systems
  - Rely on vernacular designs (before HVAC)
    - Ex: windows that open, trees on property
    - Ex: Passivhaus (limited heat and AC)
  - Use distributed energy
  - Avoid driest areas (political issue)
    - Ex: Limit taps
  - Use grey water, harvest rainwater
  - Accommodate non-perishable food supplies

## Discussion

- Anything on oasis/microclimate to read?
  - Not much. In North Africa have persistent drought and have considered creating oases. Tree canopy keeps relative humidity higher.
- Regenerative?
  - Giving back to oxygen balance.
  - Fort Collins—more moist closer to Laporte, drier by Trilby.
    - Landscape/plant palate. Tree- and shrub-scape and water feature keeps heat down.
- Resilience can be invested in. Local benefit.
  - Sustainability is solving long term problem—resilience is surviving until we do.
  - Borrowing from the past and desert landscapes—passive house idea. Retrofitting. Building all new has own GHG impacts. Water symposium in Orange County—grey water and black water use. In San Francisco any building over 25Ksf must have own water reuse system. California is figuring it out. New technology.

- Biomimicry is another field of systems analysis to explore.
- Impacts of new designs on affordability of homes?
  - Ex: Habitat for Humanity Harmony Cottages—designed 48 unit neighborhood close to net zero. Developed financing process to help owner pay off solar within 7 years. Investor is philanthropic—tax credits, zero interest loan. Pay for solar through electricity savings. Utilities is looking at utilities-as-a-service—do improvements, low interest loans.
- New UAB. From investor perspective not good investment. Ex: UAB cost at \$37/sf. Downtown price is \$18/sf. Not a competitive investment. No one is talking about getting away from AC—one of biggest energy uses.
  - More we use AC the worse the problem becomes.
  - Drive codes that direction.
  - Ex: Solar village on Foothills campus—had passive designs for cooling, convective flows for heat.
    - Trend that started 30 years ago, but cost of energy so low it never took off.
- Used to take all of stormwater to detention pond, then release. Contemplating recharging groundwater. If recharge every lot from beneath the surface, what is result?
- Introduced a lot of surface water over years (reservoirs). Underground doesn't have evaporation loss. LID (low impact development)—getting to systems thinking—doing things differently.
- Who is looking at the system? Ex: groundwater recharge, economists, etc. Can look at oasis path.
  - Systems engineering faculty at CSU can be resource. Neil Grigg.
  - Cost of power generation is too low—models for renewables based on higher cost electric generation.
- In DC infill doesn't have to use LID but can buy credits where needed more. Buy/trade credits. Investors build renewables in parking lots and fields, then sell credits.
  - Fort Collins LID concept is trying to recharge everywhere (rain gardens, pervious pavers, ADS tanks that collect rainwater and slow release underground, etc.).
  - Adjudicated water rights for ground water. Codes don't look at whole system.
    - Codes look at health and safety. Performance codes—use different construction methods. How do we evaluate performance codes vs. standard building codes?
    - Path with chief building inspector.
- Harvesting rain water?
  - Limited to 50 gallons.
  - State laws.
  - Encourage raw water or grey water for irrigation.
    - Water rights issues. Some water rights have reuse and some do not.
    - Aurora uses grey water for all park irrigation.
- Harmony Cottages example—good building design. Attractive.
  - Worked with Utilities on envelope design.
  - If not using market driven design, could get more units. Must build market-rate style. If project fails, investor wants to be able to sell.
- Retrofits. Ex: \$600/mth heating bills. How do we affect those units?
  - Leaky homes. Basically have to replace.
  - City budget allocations for retrofits.

### **DO: Next Steps**

- CMO recommended budget has municipal resilience plan funded
- Piloted extreme heat workshop

- City Plan/systems approach
- Jackie meeting with Bruce on Habitat take-aways
- Restoration of prior practices/best practices from other places
- Oxygen generation/carbon inventory
- Regenerative architecture, biomimicry, design codes for future conditions (what codes need to be implemented)
- Groundwater recharge and storage
- LID programs
- Infill credits—BMPs from other communities
- Systems team (infrastructure and planning)
- CSU researchers + City implementers (urban lab)
  - Innovation ecosystem at January Futures meeting—City as a platform, pipeline and feedback with university.
- December meeting, Joe O’Keefe will discuss community resilience
- Future speakers will build on today’s topic

**Public Comment:** Myles Crane—Does it make sense to have meeting with emergency planning, community continuity planning, critical infrastructure/services that will be impacted in case of dust/heat/etc. events?

- Municipal resilience plan will be great place to gather team to work on this issue.
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#### **Future Agenda Items**

- December: Resilient Infrastructure
  - January: Innovation Community
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*Meeting adjourned at 5:42pm.*