

Joint City Council & Planning Commission Staff Report



Subject: Bonanza Park Area Plan
Author: Katie Cattan, Senior Planner
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Department: Planning
Date: May 16, 2013 (Special Meeting 8am – 10am)
Type of Item: Work Session

Summary Recommendations:

The purpose of this meeting is to review the Bonanza Park Area Plan and provide policy direction to guide the future implementation strategies in the Bonanza Park District.

Topic/Description:

The draft Bonanza Park Area Plan was completed in January 2012 as a long-range planning document to guide future development within the existing mixed-use district. The ten (10) principles within the Bonanza Park Area Plan reinforce that redevelopment in this neighborhood should be focused on creating local housing and job opportunities in a sustainable manner. The implementation of this vision requires commitment to public/private partnerships and further policy direction by the City Council and Planning Commission toward the give/gets. The Bonanza Park Area Plan is available online at <http://www.parkcity.org/index.aspx?page=773>

Background:

The Bonanza Park District

The Bonanza Park district is the oldest commercial district outside of the City's historic Main Street area. As a planning area, the boundaries are Bonanza Drive to the East (and those properties just east of this right-of-way, e.g. Park Plaza, etc.), Park Avenue to the west, Kearns Boulevard to the north, and Deer Valley Drive to the south. This district encompasses 99 acres; five times the area of the City's renowned Main Street Historic District (±18 acres).

The area is currently a broad mix of land uses ranging from resort commissary and parking, to shops and restaurants, banking, public works buildings, residential and a special events venue. Other uses include a storage area, small art and consignment shops, banks and real estate offices. The only movie theater in the City is within the area as well as one of the City's two main grocery stores. The area is currently zoned General Commercial (GC), Light Industrial (LI), and Estate (E). The area includes housing along Kearns Boulevard (e.g. Claimjumper and Homestake Condos), within the Rail Central Development and along Ironhorse Loop.

Today, Bonanza Park plays an important role within the local economy. This commercial and light industrial area is the place where residents shop for groceries; get

repairs done to their automobiles, bikes, and skis; recycle; eat; buy paint; workout, etc. It is where locals go for everyday needs, goods, and services.

The Bonanza Park area is a prime redevelopment area due to the age of existing buildings, central location, history of mixed use, and interest of the existing property owners in improving the area. It is an opportunity to apply new urbanism principles for redevelopment that support the current population while creating new opportunities for improved quality of life, including: jobs, housing, and diversity.

Previous Direction from Planning Commission and City Council

Through the course of five (5) joint redevelopment meetings held by the City Council and Planning Commission in the summer and fall of 2011 a series of “policy agreements” were made on the City’s posture on redevelopment:

- Competition and market reality mean redevelopment is essential for a resort economy to remain viable and for its benefits (residential amenities) to continue without having to raise taxes;
- Partnership is necessary between Park City and the development community to stay sufficiently ahead of the market to obtain desired outcomes grounded in the community’s stated core values;
- Policy and other tools can be used to obtain the values-linked outcomes that the community wants; and
- Getting the development outcome the community wants requires that a series of choices be made, working cooperatively to allow one or more “gives” in order to obtain one or more “gets.”

Specifically relative to the Bonanza Park District, the Planning Commission and City Council policy agreements included:

- City Council and Planning Commission agree that Park City needs a Bonanza Park plan that:
 - Incorporates power station needs;
 - Converts BoPa to a vibrant, affordable, mixed-used, locally serving area; and
 - Balances “gives” with maximum height, density, and economic development tool usage.
- Both City Council and Planning Commission directed staff that a greater maximum height could be considered in exchange for the following:
 - Open space, a smaller footprint, view corridor protection, affordable housing, and a resulting area built within a set of design guidelines;
- Both City Council and Planning Commission directed staff to allow for additional density (through receiving Transfer of Development Rights (TDR) credits) in BoPa to obtain:
 - Protection of historic structures, increase connectivity, achieve housing affordability, achieve green building practices and recognizes the importance of environmental and economic sustainability.

Understanding the relationship between the FBC and the Area Plan

The draft Bonanza Park Area Plan suggested that a Form Based Code (FBC) for the Bonanza Park District be adopted as an implementation tool. The FBC will guide redevelopment projects to incorporate residential and mixed use development with authentic building form and materials and a cohesive public realm. The Bonanza Park Area Plan will direct the Form Based Code creation and implementation.

Prior to adopting the FBC and creation of a Community Development Area (CDA), the Bonanza Park Area Plan must be adopted as a supplement section of the General Plan, replacing the existing 2006 Bonanza Park supplemental section.

Form Based Code Development and Review

The City Council awarded the contract to develop the Form Based Code to Gateway Planning on March 22, 2012. On April 5 and 6, 2012, Gateway Planning hosted a series of stakeholder meetings for property owners, residents, and businesses within the Bonanza Park District to discuss future redevelopment in the area and introduce the concept of form based code. Gateway Planning returned to Park City to work with staff on refinement of the illustrative (site) plan based on the community input. An Open House was held on May 1, 2012. During the Open House, Gateway Planning and staff presented different options of the illustrative plan and introduced the concept of character zones within the District. The current regulating plan is based on the feedback of the public, stakeholders, Planning Commission, and City Council during these two (2) visits.

On October 24, 2012, Gateway Planning presented the first draft of the FBC during a joint Planning Commission and City Council work session. Gateway Planning presented an overview of how Form Base Code is administered and provided examples of how the code is applied. The draft BoPa-FBC presented on October 24, 2012 was approximately 70% complete. The full document will be presented to Planning Commission during the May 22, 2013 meeting and a public hearing will be held.

On May 8th, 2013, the Planning Commission held a work session to discuss key policy questions regarding the Area Plan and the form based code. Specifically, the Planning Commission discussed 1. Modifications to the Regulating Plan layout; 2. Local Business vs. National Chains strategies; and Height above three stories.

Analysis:

The Bonanza Park FBC is the first Form Based Code to be considered for adoption in Park City. The following outlines the structure of a Form Based Code and how the Bonanza Park FBC will be administered within the district.

The Park City Planning Department recommends adoption of a Form Based Code in the Bonanza Park District to create continuity of building form and the public realm throughout the district. Currently, the district lacks street and pedestrian connectivity

and a defined sense of place. There is a hodgepodge of standalone commercial and residential development that does not flow like a traditional neighborhood. By adopting a Form Based Code district wide, the district will evolve with niche neighborhoods of a residential, mixed-use, and resort oriented areas with a strong sense of place due to pattern making within the public realm. Elements influenced within the public realm include trails, sidewalks, bike lanes, pocket parks, and central gathering space. The aesthetic of the district and user experience will improve due to regulations guiding building form which influence the pedestrian experience.

Below is the existing, unconnected street network within the Bonanza Park District:



Form based code is a great tool to implement the ten Guiding Principles of the Bonanza Park Area Plan, as follows:

1. Reconnect to the history of this locale while continuing to build upon “local” history.
2. Take a collaborative partnership approach to redevelopment among the City, property owners, local residents, and business owners within the district.
3. Actively promote inward migration into the redevelopment area rather than passively allowing outward migration and sprawl.
4. Protect view corridors and the connection to the mountains.
5. Improve internal circulation as well as enhance connectivity to the surrounding mobility systems.
6. Redevelop utilizing future-oriented, environmentally-conscious development practices.
7. Maintain the area as a commercial district with special emphasis on fostering economic growth within the local resident population and existing businesses.

8. Establish Bonanza Park as an area for locals to live, work, and play within.
9. Address the housing and social needs of the neighborhood's diverse population.
10. Create an authentic and lively district through design and attention to the public realm.

Form Based Codes include a "Regulating Plan" which is adopted as the official zoning map for the district. Within any area subject to the approved Regulating Plan, the FBC becomes the exclusive and mandatory regulation. The Regulating Plan establishes Character Zones, Street Designations, Open Space/Civic Space Designations, and Special Frontage Standards. The FBC regulates the specific standards for each of these categories.

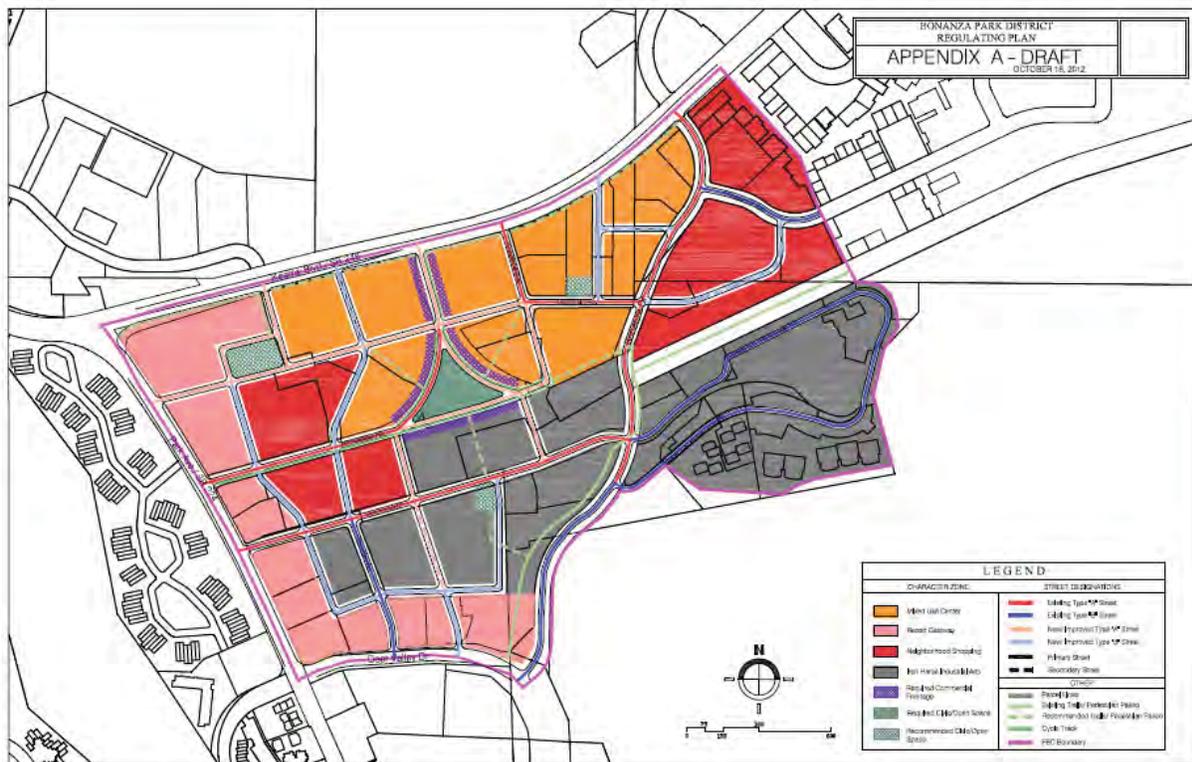
During the October 24, 2012 joint City Council and Planning Commission work session, concern was raised regarding the changes to the street layout and pedestrian pathways introduced within the Bonanza Park Area Plan and the amended street layout and pedestrian pathways proposed regulating plan for the Form Based Code. The concerns were focused on the removal of the interior pedestrian pathways and the dual purpose they achieve in pedestrian connectivity and protecting view corridors.

Planning Commission discussed the layout of the regulating plan during the May 8, 2013 work session. During the work session property owners in the district presented requested modifications to the layout and character zone changes to maintain existing residential as pure residential without a mixed use component. Planning Commission directed staff to amend the regulating plan to (1) maintain the existing residential development, (2) incorporate the suggested modifications of the property owners, and (3) create increased, meaningful open space throughout the district. Staff has incorporated this direction into the draft regulating plan. The following pages illustrate the evolution of the Bonanza Park Layout.

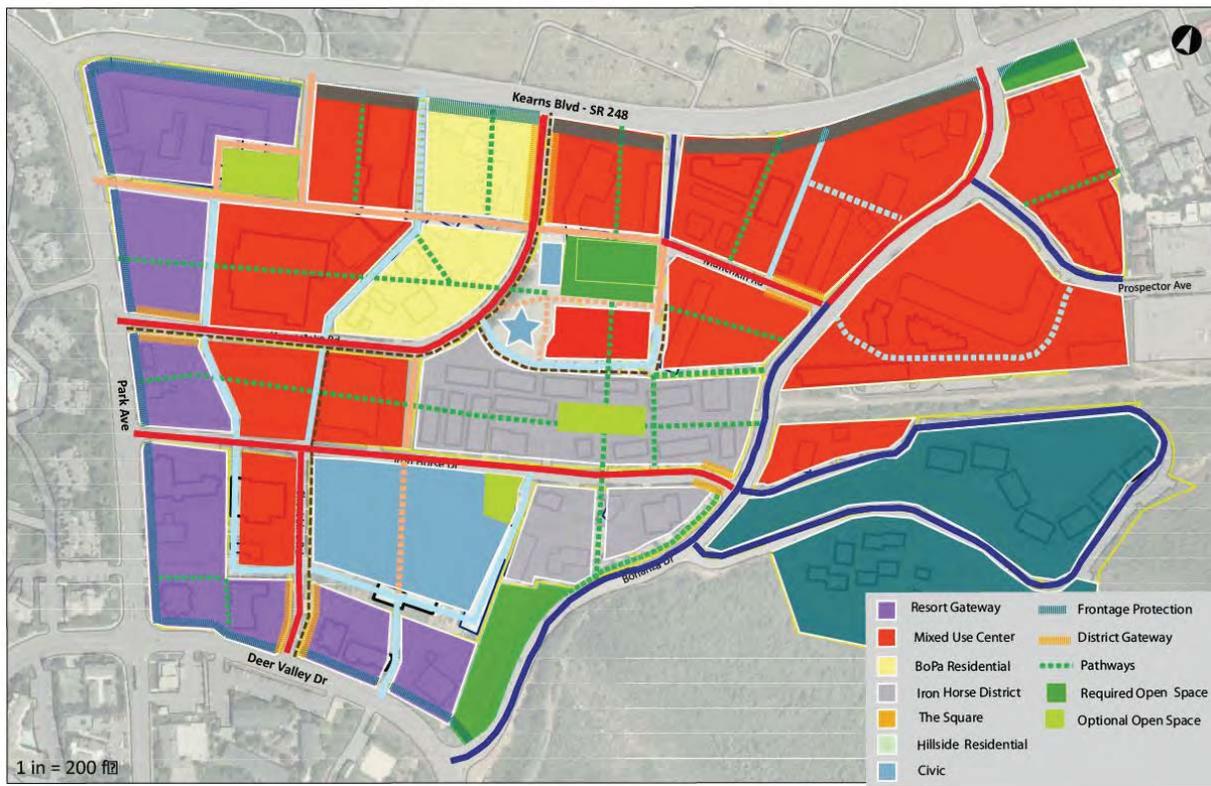
Layout from the original Bonanza Park Area Plan dated January 2012:



Layout of original Regulating Plan dated October 2012:



Layout of evolved draft Regulating Plan dated May 16, 2013:



Enhanced Options

The Bonanza Park Area Plan created enhanced options to allow developers/property owners to develop beyond the base zoning in exchange for community benefits. Section 6 (pg. 107 – 113) of the draft Bonanza Park FBC outlines the enhanced options for development greater than that established within the base zoning. The enhanced option standards allow developers to build a 4th and 5th story in exchange for a minimum right of way dedication, open space, attainable housing, net zero buildings, or transfer of development right credits. Currently, the draft area plan suggests enhanced options to allow development on the 4th story up to 75% of the ground floor building area and 25% of the ground floor building area on the 5th story.

The Bonanza Park Area Plan originally suggested including economic development strategies within the enhanced options. Due to the challenges of limiting uses through deed restrictions on business, such as requiring business incubator space, staff suggested removing economic incentives from the enhanced options. The Planning Commission and City Council voiced support for removing uses from the list of incentives during the October 24, 2012 joint work session.

Further direction is needed in the review of the Enhanced Options and identifying the appropriate tool to achieve the desired outcome.

The Enhanced Options Tool Box:

Height:

During the May 8th, 2013, Planning Commission work session, Staff requested direction regarding the use of additional height options for desired community benefits.

Commissioner Thomas requested that staff organize a field trip for the Planning Commission to observe 3, 4, and 5 story buildings to help guide the decision making process. The current FBC draft allows a maximum height of 35' in all character zones. Within the enhanced options matrix, a property owner may exceed the height limit and build upon 75% of the building pad within the fourth story (max height 50') and 25% of the building pad within the fifth story (max height 60'). The enhanced options matrix allows additional height for right-of-way dedications (roads and pathways) consistent with the regulatory plan, on-site affordable & attainable housing, transfer of development right credits, and net-zero carbon buildings.

One of the four (4) core values of Park City is "small town." The staff and Planning Commission have concerns that the enhanced options, as currently proposed up to 5 stories (60' max), may threaten the "small town" experience. As discussed during the May 9th Joint Planning Commission & City Council work session, a self-guided tour is recommended prior to the May 16th joint meeting. Also, an excerpt from Jan Gehl's book Cities for People is included in the packet as Exhibit A. This excerpt focuses on "sense of scale."

The following locations are suggested areas to observe variety in building height:

- Sugar House: 21st South and 11th East looking west;
- Tony Caputo's (314 W 300 S) north to Gateway Mall; and
- Lower Main Street Marriott Summit Watch.

Funding

The City may opt to utilize funding to achieve some of the desired outcomes within the Bonanza Park Area Plan. Street rights-of-way, increased affordable/attainable housing, open space, and business/tech improvements may be enhanced through funding mechanism rather than height. Currently, the City Council has directed staff to evaluate the potential creation of a Community Development Area (CDA) for the Bonanza Park Area as an economic development tool to facilitate redevelopment of the area. "CDA's" are intended to undertake any economic or community development purpose of the city, including job growth or retail sales. A CDA is a form of tax increment finance which would allow the City to define a community project area which is expected to see sales and property tax growth as a direct result of project improvements. The CDA, as currently being evaluated, will be used almost exclusively for the relocation costs of the Rocky Mountain Power. The current boundary for the CDA includes those properties in close proximity to the substation.

If directed by the City Council, staff could research the methodology for the creation of another CDA or expansion of the existing CDA as well as other funding mechanisms to help facilitate desired outcomes within the Bonanza Park Area Plan. Some of the future

financing challenges for the area include street and sidewalk improvements, park improvements, possible shared parking areas, signage (wayfinding), etc.

Desired Outcomes

Desired Outcome 1: Affordable Housing

The current enhanced option matrix sets policy to allow an additional square foot of development for each square foot of development designated to affordable housing and attainable housing. (Bonanza Park Area Plan pg. 110) For an explanation on the reason behind the affordable housing options, please see Principle 8 of the Bonanza Park Area Plan (pg. 72). This enhanced option goes beyond the typical affordable housing allowances within the current Land Management Code.

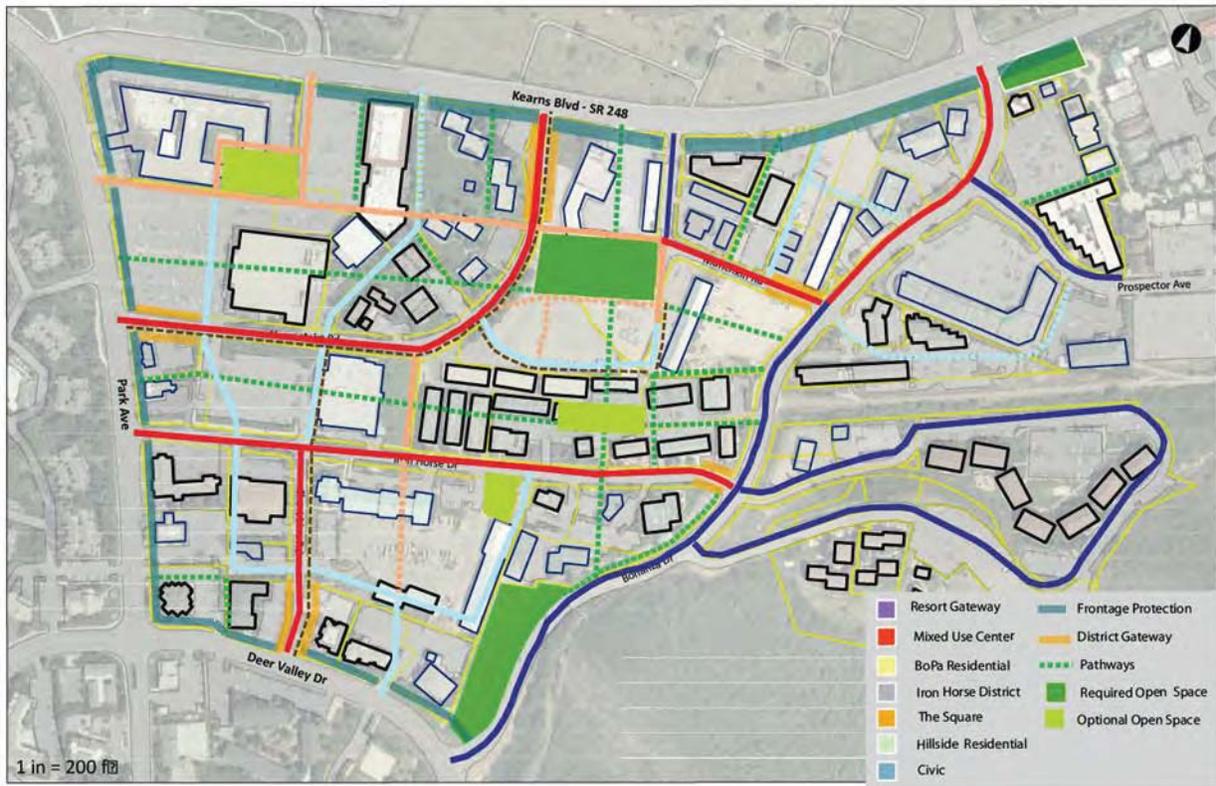
Park City has adopted an “inclusionary housing” policy in which deed restricted affordable housing units do not count toward a developer’s maximum unit equivalents; however, the units must be built *within* the building pad of the site with no exception to go beyond the zone height. Within developments that contain 100% affordable housing and no market rate units, additional incentives toward decreased open space are allowed. City Council and Planning Commission could direct staff to remove the affordable/attainable housing incentive from the incentives matrix and require that the required units be built within the allowed building envelope.

DISCUSSION and DIRECTION REQUESTED:

- 1. Should Planning Staff include housing within the enhanced option for Affordable Housing or should developers within this area build all affordable housing within the building envelope?*
- 2. Do City Council and Planning Commission believe that ADDITIONAL attainable housing, as part of a mixed-use development, may be incentivized by an increase in height?*

Desired Outcome 2: Right-of-Way Dedications:

Increased connectivity throughout the district is a priority to create a neighborhood that functions properly for pedestrians, bicycles, public transit, and automobiles once it is built-out. The enhanced options matrix allows for one (1) square foot of development per one (1) square foot of right-of-way dedication of Primary Streets (solid light pink and light blue roads) and ½ square foot of development per one (1) square foot of right-of-way dedication of Secondary Streets (dashed light pink and light blue roads).



The 2012 Traffic Study identified the costs associated with the menu of right of way options presented in the Bonanza Park Area Plan. The resulting cost estimates within the study for construction of the January 2012 street and trail networks was estimated at \$8.5 million dollars; including, \$8.1 for the street network and \$0.4 million for the trails. It is typical within greenfield development for a developer to pay for the cost of new roads, then the City will maintain the roads if they become dedicated right-of-way. Due to the infill nature of Bonanza Park and multiple property owners, the City must collaborate and partner financially with property owners to achieve desired circulation in the district.

The staff would like to revisit the Enhanced Option for road dedications with the City Council and Planning Commissioners, primarily due to the hesitation toward additional height in the district. In addition, staff would like to further explore the utilization of CDA funds for additional infrastructure work in the Bonanza Park district.

| Typical Section DESCRIPTION | ROW Width (ft) | Cost (Exist) (\$/LF) | Cost (New) (\$/LF) | Travel Lane Width (ft) | Bike Lane Width (ft) | Parking Width (ft) | Walk Width (ft) |
|---|----------------|----------------------|--------------------|------------------------|----------------------|--------------------|-----------------|
| Interior Block No Cycle Track | 52 | \$ 270 | \$ 460 | 10 | - | 8 | 8 |
| Interior Block with Cycle Track - Along Rounded Edge of Spur | 52 | \$ 270 | \$ 470 | 10 | 11 | 8 | 15 |
| Interior Block with Cycle Track - Along Straight Edge of Spur | 55 | \$ 280 | \$ 510 | 10 | 11 | 8 | 8 |
| Interior Block with Cycle Track - Roads with Cycle Track and Two Sides of Floating Parking Lane | 63 | \$ 310 | \$ 540 | 10 | 11 | 8 | 8 |

DISCUSSION and DIRECTION REQUESTED:

3. *Would the City Council and Planning Commission like the enhanced height option in exchange for R-O-W dedications to remain in the incentive matrix; or prefer that Staff remove R-O-W dedications from the enhanced options and begin exploring the possibility of funding to partner with developers on the construction of the pathways and roads?*

Desired Outcome 3: Transfer of Development Rights (TDR) receiving zone

The draft Bonanza Park Area Plan allows for Transfer of Development Rights (TDR) credits to be received within the Enhanced Option area (75% of building area within the 4th story, 25% of building area within the 5th story). TDR sending zones in Park City are primarily located within the Historic District as a historic preservation tool, steep slope protection, and view protection. The Bonanza Park District is a receiving zone for TDR credits.

Height is the only viable option to creating additional buildable area in which to receive development credits within the Bonanza Park.

DISCUSSION and DIRECTION REQUESTED:

4. *Would the City Council and Planning Commission like the enhanced height option to allow development of TDR credits within the 4th and 5th stories to remain in the incentive matrix?*

Desired Outcome 4: Net Zero Carbon Buildings

The draft Bonanza Park Area Plan allows for Net Zero Carbon Buildings to be received within the Enhanced Option area (75% of building area within the 4th story, 25% of building area within the 5th story). A net zero carbon building is a building that produces, at a minimum, the energy it consumes without contributing carbon to the atmosphere. If a developer opts to build a net zero carbon building, the Bonanza Park area plan suggests allowing the developer to build to the maximum of the enhanced options matrix.

DISCUSSION and DIRECTION REQUESTED:

- 5. Would the City Council and Planning Commission like the enhanced height option to allow net zero carbon building to build within the 4th and 5th stories to remain in the incentive matrix?*

Next Steps:

Planning Commission review of the Bonanza Park Area Plan is a staff priority. The Area Plan must be adopted prior to the creation of the Community Development Area (CDA). Staff plans to begin moving forward on the creation of a CDA in August of 2013. The following table outlines the future Planning Commission and City Council meetings for review of the Bonanza Park Area Plan.

| Review Calendar for PC and CC for BoPa Area Plan and FBC | | |
|--|---------|--|
| May 16th | PC & CC | Joint policy discussion on enhanced options of Bonanza Park Area Plan |
| May 22nd | PC | Form Based Code with Gateway Planning |
| June 12th | PC | Bonanza Park Area Plan review #1 |
| June 26th | PC | Bonanza Park Area Plan review #2 |
| July 10th | PC | Bonanza Park Area Plan review #3. Recommendation to CC |
| July 25th | CC | Bonanza Park Area Plan review & possible adoption by City Council |
| August 1st | CC | Bonanza Park Area Plan adoption by City Council (if not adopted 7/25) |

A second priority is compilation of the Lower Park Avenue and Resort Center studies, with an executive summary document for future planning in the area, by the Planning Director. The executive summary and previous studies will be published within the August 1st City Council packet.

The Planning Commission & City Council did not get to complete the prioritization of other long range planning documents during the May 9, 2013 joint work session. Staff suggests the following timeline for the review of the General Plan.

| Review Calendar for PC and CC for FBC and General Plan | | |
|--|---------|---|
| August 14th | PC | Form Based Code review by Planning Commission |
| August 13th | PC & CC | General Plan Joint Meeting Kickoff |
| August 28th | PC | General Plan: Small Town Trends (pg 15 – 34); Small Town Goals, Principles, & Strategies (pg 93 – 114); Small Town Strategies (pg 175 – 199) |
| August 29th | PC | Form Based Code review by Planning Commission |
| September 11th | PC | General Plan: Review of August 28th edits of Small Town |
| September 25th | PC | Form Based Code review by Planning Commission with recommendation to City Council |
| October 9th | PC | General Plan: Natural Setting Trends (pg 35-47); Natural Setting Goals, Principle, & Strategies 117 – 130; Natural Setting Strategies (201 – 236) |
| October 23rd | PC | General Plan: Review of October 9 th edits of Natural Setting |
| November 13th | PC | General Plan: Sense of Community Trends (pg 48-88); Sense of Community Goals, Principles, & Strategies(pg 131-162); Sense of Community Strategies (Large Section. Meeting 1 of 2) |
| November 14th | CC & PC | Joint Meeting to discuss progress on General Plan and Form Based Code |
| November 20th Special Mtg. | PC | General Plan: Sense of Community Trends (pg 48-88); Sense of Community Goals, Principles, & Strategies(pg 131-162); Sense of Community Strategies (Large Section. Meeting 2 of 2) |
| December 11th | PC | General Plan: Review of November 13 th and 20 th edits of Sense of Community |
| December 25th | PC | HOLIDAY |
| 2014 | | |
| January 8th | PC | General Plan: Historic Character (pg. 89-92); Historic Character Goals, Principles, & Strategies (pg. 165-174); Historic Character Strategies (pg. 289-310) |
| January 22nd, | PC | General Plan: Review January 8 th edits of Historic Character |
| February 12th | PC | General Plan: Neighborhoods 1 – 5 |
| February 25th | PC | General Plan: Neighborhoods 6 - 9 |
| March 12th | PC | General Plan: Recommendation to City Council |
| March 27th | CC & PC | Joint Meeting for Planning Commission to present General Plan to City Council. |
| Beyond April 2014 | CC | General Plan review by City Council. |

Questions for City Council and Planning Commission regarding future scheduling:

1. What feedback do the City Council and Planning Commission have on the proposed schedule for General Plan and Form Based Code?

2. What is the process by which the schedule can be changed? (While this may seem to some as a trivial topic, where there has been concern in the past about schedule changes, it is important to come to an agreement on the process to change the schedule.)
 - a. If City Council wants the schedule extended:
 - i. Mayor and Planning Commission Chair discuss and decide; or
 - ii. Mayor informs Planning Commission Chair; or
 - iii. Other
 - b. If Planning Commission wants the schedule extended:
 - i. Planning Commission Chair and Mayor discuss and decide; or
 - ii. Planning Commission Chair informs Mayor; or
 - iii. Other
 - c. If Staff wants the schedule extended:
 - i. Planning Director informs City Manager and City Manager discusses and decides with Mayor; other
 - ii. Planning Director informs City Manager and City Manager informs Mayor and Council; or
 - iii. Other

Summary Recommendations:

Staff recommends that the Planning Commission and City Council provide staff with direction on the policy questions raised within the report pertaining to the Bonanza Park Area Plan.

Exhibits

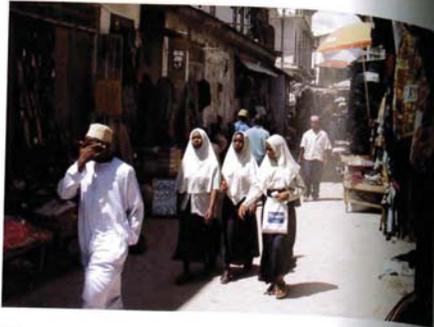
Exhibit A – Jan Gehl Cities for People excerpt

Again, please note: The Bonanza Park Area Plan is available online at <http://www.parkcity.org/index.aspx?page=773>

senses, movement and space



The client: a linear, frontal, horizontal, maximum 5 km/h – 3 mph human being (Laura, age 1).



The basic elements of city architecture are movement space and experience space. The street reflects the linear movement pattern of feet and the square represents the area the eye can take in (Stone Town, Zanzibar, Tanzania, and Ascoli Piceno, Italy).



This little town is nestled in the bay

a linear, frontal, horizontal mammal walking at max 5 km/h – 3 mph

distance and perception

22

2.1 Senses and scale

The natural starting point for the work of designing cities for people is human mobility and the human senses because they provide the biological basis for activities, behavior and communication in city space.

Twenty-first century urban pedestrians are the result of an evolution over millions of years. Man has evolved to move slowly and on foot, and the human body is linear in orientation.

While our feet can walk or run forward with ease, they move backwards or sideways with great difficulty. Our senses have also developed to allow slow, forward movement on largely horizontal surfaces.

Our eyes, ears and nose face forward to help us sense danger and opportunities on the route ahead. The rods and cones in the photoreceptor layer of the eye are organized to match our horizontal, earth-bound field of experience.

We can see clearly ahead, peripherally to the sides, downward to some extent and much less upwards. Our arms also point forward and are well positioned for touching something or pushing branches aside along our route. In short, Homo sapiens are a linear, frontal, horizontally oriented upright mammal. Paths, streets and boulevards are all spaces for linear movement designed on the basis of the human locomotor system.

One of the most memorable moments in life is the day a child stands upright and starts walking: now life is about to start in earnest.

So here is our client, a pedestrian with all his attributes, potential and limitations. Basically, working with the human scale means providing good city spaces for pedestrians that take into account the possibilities and limitations dictated by the human body.

In his books *The Silent Language* (1959) and *The Hidden Dimension* (1966), the American anthropologist Edward T. Hall has provided an excellent survey of human evolutionary history and an introduction to human senses, their features and importance.¹

Sensory development is closely tied to evolutionary history and can be simply classified into the "distance" senses: seeing, hearing and smelling, and the "close" senses: feeling and tasting, which are related

Human Scale

social field of vision



We can see people 100 meters/328 feet away, and if the distance is shortened, we can see a bit more. But the experience only becomes interesting and exciting at a distance of less than 10 meters/33 feet, and preferably at even closer ranges where we can use all our senses.²

other human being as a dim shape in the distance. Depending on the background and light, we can identify people as human rather than animals or bushes at a distance of 300 to 500 meters (330 to 550 yards).

Only when the distance has been reduced to about 100 meters (110 yards) can we see movement and body language in broad outline. Gender and age can be identified as the pedestrian approaches, and we usually recognize the person at somewhere between 50 and 70 meters (55 and 75 yards). Hair color and characteristic body language can also be read from this distance.

At a distance of about 22–25 meters (24–27 yards), we can accurately read facial expression and dominant emotions. Is the person happy, sad, excited or angry? Increasingly more detail becomes visible as the person comes closer, with the viewer's field of vision being directed to the upper body, then to the face only and finally only to parts of the face. In the meantime, the person has long been within hearing distance: At 50–70 meters (55–75 yards) we can hear shouts for help. At 35 meters (38 yards)

one-way communication can be conducted in a loud voice like that used from the pulpit, stage or auditorium. At a distance of 20 to 25 meters (22 to 27 yards), short messages can be exchanged, but genuine conversation is not possible until people are within seven meters (7.5 yards) of each other. The shorter the distance in the range from seven meters (7.5 yards) to half a meter (19.5 inches), the more detailed and articulated the conversation can be.³

The other senses also come into play as distance lessens: we can smell sweat or perfume. We can sense temperature differences on the skin, an important means of communication. Blushing, affectionate glances and white-hot anger are exchanged close up. Physical affection and touching are naturally also relegated to this intimate sphere.

social field of vision

We can summarize these observations about distance, senses and communication by saying that very little happens at distances from 100 to about 25 meters (110 to 27 yards), after which richness of detail and communication intensify dramatically meter by meter (yard by yard). Finally, between seven to zero meters (7.5 to 0 yards), all of the senses can be used, all details experienced and the most intense feelings exchanged.

In an urban planning context, where the relationship between the senses, communication and dimensions is an important theme, we speak of a social field of vision. The limit of this field is 100 meters (110 yards), the point at which we can see people in motion.

Twenty-five meters (27 yards) is another significant threshold, the one at which we can start decoding emotions and facial expressions. Not surprisingly, these two distances are key in many physical settings where the focus is on watching people.⁴

watching events

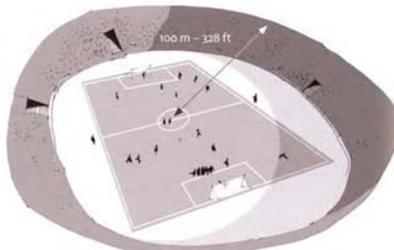
Arenas built for spectator events such as concerts, parades and sports bring the 100-meter (110-yard) distance into play once more. For athletics or sports matches where spectators need to keep their eye not only on the overall situation but also on the ball, people and movement, the distance from mid-field to the furthest seats is about 100 meters (110 yards).

Arenas are designed so that the seating towers above the field itself. That way spectators see everything slightly from above, which is usually not a problem for sports events, where the general patterns of activity are themselves an important part of the attraction. Tickets can be sold as long as seats are located within the magic range of approximately 100 meters (110 yards) — the distance from which we can see people moving.

This 100-meter (110-yard) distance also provides an upper limit to how many people can be packed together. Even the largest arenas can only accommodate a relatively limited number of spectators with a maximum of about 100,000 seats, such as Barcelona's football arena Camp Nou (98,772) or the Olympic Stadium in Beijing (91,000).

to see events

The ability to see people at distances up to 100 meters/328 feet is reflected in the dimensions of spectator space for watching sports and other events.



What we have here is a highly effective 100-meter (110-yard) "viewing wall," a biological limit to the size of such facilities. If the number of spectators is to be increased, the focus of their viewing attention must be magnified. At rock concerts both picture and sound are magnified on a large screen adapted to the total size of the spectator space. At drive-in theatres movies are projected onto a giant screen so that viewers can follow the action even from quite a distance.

experiencing emotion

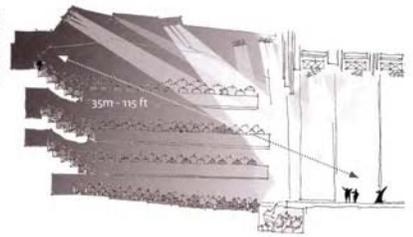
The second threshold value appears in the theatre or opera house, namely the approximately 25 meters (27 yards) from which facial expression, well-articulated singing and conversation can be experienced. In both the theater and the opera, the primary purpose of communication is to evoke mood and emotion. Faces must be visible and variations in vocal pitch heard.

If we look at theatres and opera houses around the world, however, the critical distance between stage and the most distant seats turns out to be 35 rather than 25 meters (38/27 yards). The reason for this enlarged spectator extension can be found in the actors' body language, make-up and voice projection. Make-up accentuates and exaggerates facial expression, body movements are cleverly emphasized, body language becomes "theatrical," and language is modulated through articulation and exaggeration, as is known from the "stage whisper" that can be heard 35 meters (38 yards) away. All these ploys give theatergoers a strong impression of the emotions being played out — even though the stage is actually 35 meters (38 yards) away. That is the limit of what is possible.

Theaters and opera houses also extend the seating in height and to the sides in order to achieve the greatest capacity. Ground-floor orchestra seating is supplemented by one, two or even three balconies that tower above the stage, as well as side balconies raised high above the stage floor. The magic 35 meters (38 yards) is the common denominator that allows us to sense and feel.

to experience emotions

When emotion rather than motion is in the spotlight, 35 m / 115 feet is the magic number. Used in theatres and opera houses all over the world, this is the greatest distance at which audiences can read facial expression and hear speech and song.



you get the experience you pay for

Even though a space can physically accommodate a certain number of spectators, the quality of the experience varies dramatically, and this difference is reflected equally dramatically in ticket prices. The highest prices are exacted for seats in the middle of the theatre closest to the stage, in the first rows on the ground floor or first rows in the balcony. From these seats the audience can view the performance frontally, up close and more or less at eye level. The most powerful experience is to be had here. Seats cost less further back because the experience is less intense, although it is still frontal and at eye level. Higher up, further away and further out to the sides, the experience becomes more distant and the view more awkward, and ticket prices are correspondingly lower. Finally there are the cheapest seats in the uppermost balcony and all the way out to the sides. In fact from these seats you can't really see the performance, only the actors' wigs and the patterns in which they move. In compensation these ticket-holders can hear the actors' lines and get a good view of the wings.

Theatre seats and ticket prices tell us something significant about our sensory apparatus and human communication. Key words for the most attractive seating are: close up, largely frontal and at the same level. Key



Our sense of sight has developed to enable us to see and comprehend what is happening on the horizontal plane. If we see people and events from above or below, it is rather difficult for us to grasp essential information.

scale, senses and the dimensions of city space

words for the less attractive seating are: greater distance and seen from the side. Least attractive by far is the view from on high. From this perspective the viewer can see distant views, but certainly not faces and emotions.

The social field of vision at approximately 100 meters (110 yards) is also reflected in the size of most squares and plazas in old cities. The 100-meter (110-yard) distances enables onlookers to stand on one corner and get a general view of what is going on in the square. Walk a few paces into the square and at 60 – 70 meters (65 – 77 yards) they can begin to recognize people and thus see who else is there.

Many old squares in Europe are found within this range of dimensions. Squares are rarely larger than 10,000 m² (11,960 sq. yards), with the majority measuring 6 – 8,000 m² (7,000 – 9,500 sq. yards), and many are much smaller. If we look at dimensions, distances greater than 100 meters (110 yards) are rare and 80–90-meter (87–98-yard) lengths much more common. Width varies from plazas that are geometrically square to those that have the more common rectangular shape, and a typical measurement may be 100 x 70 meters (110 x 76 yards). In a square of this size you can see activities everywhere. If you take a walk through the square, you can see most faces within the 25 meters (27 yards) that enable you to observe facial expression and detail. The dimensions of the space offer the best of two worlds: overview and detail.

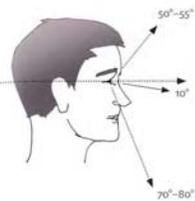
In the Tuscan town of Siena, the main square, Piazza del Campo, is a large space. It is longest on the Town Hall side, 135 meters (147 yards), and 90 meters (98 yards) on the other dimension. A row of bollards just inside the perimeter creates a new space at about the magic 100 meters (110 yards) distance of experience. The middle of the square, which is sunken like a deep bowl, provides a perfect view and a space for activities. The Campo in Siena demonstrates that large spaces can also have a human dimension, provided they are carefully designed.

the square — staying and activity space proportioned to match the eye's ability

Where paths and streets were described in the preceding section as movement space whose form can be directly related to the linear movement of feet, squares and plazas as spatial shape can correspondingly be related to the eye and its potential to grasp events within a radius of 100 meters (110 yards). Whereas the street signals movement: "please move on," psychologically the square signals staying. Whereas movement space says "go, go, go," the square says: "stop and see what's happening here." Both feet and eyes have left an indelible mark on urban planning history. The basic building blocks of urban architecture are movement space: the street, and experience space: the square.

a horizontal sensory apparatus

It has already been mentioned that the price of theatre tickets falls dramatically when the performance cannot be experienced at eye level —



Our sense of sight has developed to enable us to walk on a horizontal plane. We do not see much above us and only slightly more when we look down in order to avoid obstacles in our path. In addition, we typically bow our heads 10 degrees while we are walking.¹

Low buildings are in keeping with the human horizontal sensory apparatus, but high buildings are not (Boat and Turning Torso, Malmö, Sweden).

The location of the vegetables in front of the shop makes its own statement about field of vision.



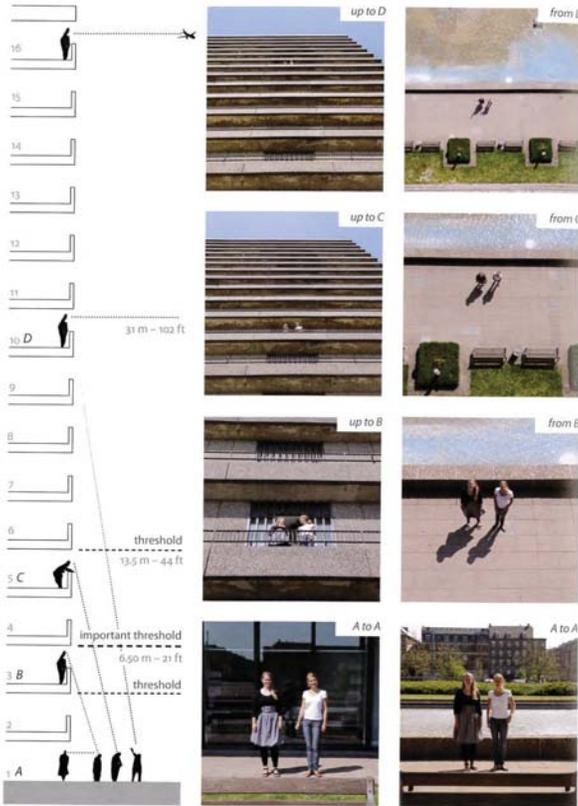
with the view from the highest balcony being particularly unpopular. The explanation is mankind's horizontally developed sensory apparatus. As they evolved, sight, the other senses and the body have adapted to a situation in which their owners moved linearly and horizontally at a walking pace. Earlier in our history it was important for walkers to be able to detect dangers and enemies lurking ahead, and to spot thorns and scorpions on the path in front of them. It was also crucial to be able to keep an eye on what was happening on both sides of the path.

The eye can see clearly and precisely straight ahead and at a great distance. Furthermore, the rods and cones in the photoreceptor layer of the eye are organized primarily horizontally, enabling us to see movement further out in the field of vision, perpendicular to the walking direction.

However, our downward and upward sight has developed very differently. Looking down where it is important to see what we are stepping on,

Human Scale
Vertical Field of Vision

senses and tall buildings



Left: contact between building and street is possible from the lowest five floors. Contact with the city quickly dissipates above the fifth floor, with the contact interface changing to views, clouds and airplanes.

we humans can see up to 70 – 80 degrees below the horizon. Upwards, where in the later phases of evolutionary history we had only few enemies to beware of, the angle of vision is limited to 50 – 55 degrees above the horizon.

In addition, we can move our head quickly from side to side if we need to focus on something happening by the roadside. It is also easy to bend our head down, and in fact our head is usually inclined about 10 degrees downward during normal walking so that we can better assess the situation on the path. Raising our head upward is much more difficult.⁸

Our senses and our locomotor apparatus paint a clear picture of an extremely alert pedestrian who looks ahead and down, but has only a limited field of upward vision. Thus hiding in trees has always been a good idea. Looking down is easy enough, but looking up is another story: we have to literally "crane our necks."

This whole account of the horizontal sensory apparatus is the key to how we experience space, for example, how much of buildings pedestrians experience when walking along streets. Naturally that also impacts on the experience of low-rise and tall buildings in cities. In general, the upper floors of tall buildings can only be seen at a distance and never close up in the cityscape.

Events that take place in urban space or in the doors and windows on ground floors can be seen at a distance of up to 100 meters (110 yards). In these situations, we can also get close up and bring all our senses to bear. From the street, we can only experience with difficulty events that take place higher up in buildings. The higher up, the more difficult it is to see. We have to move further and further back to look up, distances become greater and greater, and what we see and experience diminish.

Our horizontal field of visions means that when we are walking along building façades, only the ground floors can offer us interest and intensity. If ground floor façades are rich in variation and detail, our city walks will be equally rich in experience (street in Gamla Stan, Stockholm, Sweden, and ground floors in Dublin, Ireland).



time to look



When we walk we have time to see faces and details (Piazza Navona, Rome, Italy). And it is still possible to see a fair amount of detail when we bicycle (18 km/h - 11 mph) or run (12 km/h - 7.5 mph).



ishes. Shouting and gesticulating don't help much. In fact the connection between street plane and tall buildings is effectively lost after the fifth floor.⁷

Communication from tall buildings to their surroundings is correspondingly excellent from the two lower stories and feasible from the third, fourth and fifth floors. From there we can watch and follow the life of the city; talking, shouting and arm movements can be perceived. We are actually taking part in the life of the city. Above five stories the situation changes drastically. Details cannot be seen, people on the ground can neither be recognized nor contacted. Above the fifth floor, offices and housing should logically be the province of the air-traffic authorities. At any rate, they no longer belong to the city.

perception and speed
— a 5 km/h (3 mph) creature
that can also manage 15 km/h (9
mph)

Our sensory apparatus and systems for interpreting sensory impressions are adapted to walking. When we walk at our usual speed of four to five km/h (2.5 - 3 mph), we have time to see what is happening in front of us and where to place our feet on the path ahead. If we meet other people, we can see them from a distance of 100 meters (110 yards). It takes between 60 and 70 seconds before we actually meet face to face. Within this timeframe our volume of perceived information increases, and there is plenty of time to assess and respond to the situation.

When running at 10 - 12 km/h (6 - 7 mph), we can still perceive and process sensory impressions and thus gain an acceptable level of control over the situation, assuming that the road is even and the surroundings reasonably easy to comprehend. It is interesting that the running experience largely corresponds to cycling at an ordinary speed of 15 - 20 km/h (9 - 12 mph). As cyclists we are also in good sensory contact with our surroundings and other people.⁸

If the road is full of obstacles or the big picture is too complex, our running and cycling speed drop because otherwise we wouldn't have time to see, understand and react. We have to slow down to about five km/h (three mph) to grasp the overall picture as well as the details.

Motorway accidents are a good example of how important low speed is to our having enough time to see what has happened, with drivers in the opposite lanes typically braking and crawling past at walking speed to watch. Another and far less macabre example is the lecturer who shows his slides too quickly, until the audience asks for more time to look at each one.

human scale — and car scale

5 km/h (3 mph) architecture and 60
km/h (36 mph) architecture.

At speeds greater than walking or running, our chances of seeing and understanding what we see are greatly diminished. In old cities where traffic was based on walking pace, space and buildings were designed as a matter of course on a five km/h (three mph) scale. Pedestrians don't



Human Scale
Vision

Human Scale
Visual Field of Vision

5 km/h (3 mph) architecture — 60 km/h (37 mph) architecture



5 km/h (3 mph)



60 km/h (37 mph)



5 km/h (3 mph)



60 km/h (37 mph)

The 5 km/h (3 mph) scale has small spaces, small signals, many details — and people close by. The 60 km/h (37 mph) scale has large spaces, large signals and no details. At that speed it is not possible to see details — or people.

take up much space and can easily maneuver in a narrow setting. They have time and leisure to study the details of buildings up close as well as survey mountains in the distance. People can similarly be experienced both at a distance and right close up.

Five km/h (three mph) architecture is based on a cornucopia of sensory impressions, spaces are small, buildings are close together and the combination of detail, faces and activities contributes to the rich and intense sensory experience.

Driving in a car at 50, 80 or 100 km/h (31, 50 or 62 mph), we miss out on the opportunity to grasp detail and see people. At such high speeds spaces need to be large and readily manageable, and all signals have to be simplified and magnified so that drivers and passengers can take in the information.

The 60 km/h (37 mph) scale has large spaces and wide roads. Buildings are seen at a distance, and only generalities are perceived. Details and multifaceted sensory experiences disappear, and from the perspective of a pedestrian, all signs and other information are grotesquely magnified.

Taking a walk in 60 km/h (37 mph) architecture is an impoverished sensory experience: uninteresting and tiring.

5 km/h (3 mph) architecture — 100 km/h (62 mph) architecture

Venice is a 5 km/h (3 mph) city with small spaces, elegant signals, fine details and many people. It is a city that offers a wealth of experiences and sensory impressions.



Dubai is primarily a 100 km/h (62 mph) city: large spaces, large signals, large buildings and high noise level.



Analysis:

Data communications requires use of a medium to carry digital signals—this includes air, copper, and glass mediums. Each of these mediums have physical properties that determine the amount of data and distance the data can effectively travel.

Air (Wireless): Highly flexible and excellent for medium bandwidth mobile devices; subject to frequency congestion and expensive carrier costs.

- Wi-Fi home infrastructure
- 4G cellular
- Bandwidth performance varies by distance, obstructions such as walls, trees, mountains and radio interference.

Copper (Wire): Ideal for interior spaces (short-distances) with high bandwidth flexible connections; low bandwidth over long-distances and susceptible to interference.

- Medium distance infrastructure; similar to the municipal street system
- Bandwidth limitations to 10 gigabytes

Glass (Fiber): Superior for high bandwidth and spanning large distances; less flexible and requires specialized connections and skills for installation.

- Core infrastructure; similar to the highway system
- Physical bandwidth limitations of fiber have not yet been reached

National Policy

According to the National Broadband Plan, released by the FCC in 2010, government can influence the broadband ecosystem in four ways:

- Design policies to ensure robust competition and, as a result, maximize welfare, innovation, and investment.
- Ensure efficient allocation and management of assets government controls or influences, such as spectrum, poles, and rights-of-way, to encourage network upgrades and competitive entry.
- Reform current universal service mechanisms to support deployment of broadband and voice in high-cost areas; and ensure that low-income Americans can afford broadband; and in addition, support efforts to boost adoption and utilization.
- Reform laws, policies, standards, and incentives to maximize the benefits of broadband in sectors government influences significantly, such as public education, health care, and government operations.

In addition to the recommendations of the National Broadband Plan, it also presents six long-term goals to accomplish over the next decade:

- At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 50 megabits per second.
- The United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.
- Every American should have affordable access to robust broadband service, and the means and skills to subscribe if they so choose.