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MEMORANDUM

To: Houghton Community Council

From: David Barnes, Green Building Lead and Project Manager
Paul Stewart, Deputy Planning Director

Date: March 15, 2011

Subject: Green Codes Project
File NO. ZON10-00031

RECOMMENDATION

Staff recommends the Houghton Community Council review the staff and Technical Advisory Board Alternatives and provide feedback and direction for future refinements.

BACKGROUND

Introduction

According to the Brundtland Report (1987), Sustainable Development is defined as meeting the needs of the present without compromising the ability needs of the future. Developing zoning code amendments to reduce stormwater pollution, increase infiltration and water quality, promote and preserve open space, generate clean renewable energy, retrofit existing structures for energy efficiency are all part of an integrated approach to more sustainable development. The Green Code amendments provide an opportunity to weave sustainable actions such as Low Impact Development (LID) and green building techniques into the Zoning Code.

Staff met with the City Council on January 4th 2011 to provide an overview of this project. Feedback was provided to move forward with exploring alternatives and incentives to promote sustainable development actions. On February 27th 2011 staff briefed the Planning Commission and discussed the provided materials and next steps. A presentation was made to the Houghton Community Council on February 28th 2011 and staff received feedback. After these three presentations staff was instructed to pursue incentive based codes for this project. Another study session is scheduled with the Planning Commission on March 24th 2011. Comments from that meeting will be provided on March 28th 2011 to the Houghton Community Council. A Technical Advisory Board (TAB) was formed as part of getting professional development professional's opinions and feedback on staff ideas.

Technical Advisory Board

On February 4th and March 4th 2011, staff met with the Technical Advisory Board (see Attachment 1) to discuss some of their recommendations to address the sustainable action alternatives. Meeting notes for the meeting held February 4th 2011 have been provided as attachment 2. The Technical Advisory Board has been enlisted to assist staff in coming up with alternatives from a development professionals perspective. The TAB members range in specialties from architect, stormwater engineer, landscape architect and LID professional. Each member represents a wide range of clients that include individuals, developers and businesses. Their perspectives brings into the discussion consideration of the client's needs and costs. Therefore cost efficient, new techniques are typically evaluated. In some cases traditional methods are suggested depending on the site conditions of the project. Staff plans to meet at least one more time with the TAB to finalize their recommendations. Representatives from the TAB are willing to attend the Commission meeting and participate in the discussion.

Issue Discussion and Alternative Approaches

Staff has organized the proposed sustainable actions into the format provided below as a beginning point for this discussion. The specific issues refer back to Attachment 2 (Staff Draft Alternatives) and Attachment 3 (Technical Advisory Board Alternatives). Please refer back to each of these attachments for more detailed information. Staff has also been researching other cities' codes on sustainable actions and approaches. Attachment 4 shows neighboring cities' standards.

Green Infrastructure

ISSUE (A1): Covered bicycle stalls or storage is not a requirement in the Zoning Code or design regulations. This does not promote usage of required bicycle stalls during inclement weather and lack of bicycle storage requirements does not encourage employees of commercial establishments to bike to work.

STAFF ALTERNATIVES:
1- Require covered bicycle stalls with new multi-family, office or commercial development
2- If covered bicycle stalls or storage is provided, allow to count as part of vehicle parking requirements.

TAB COMMENTS:

- Require bicycle storage areas to be part of building/architecture and not prefabricated units in open space.
- Provide one covered bicycle space per unit for multifamily recommendations.

STAFF RECOMMENDS:
Alternatives1 and 2.

ISSUE (A2): Kirkland's Parking Regulations do not reflect priority parking for hybrid, low emission, electric or fuel efficient vehicles.

STAFF ALTERNATIVES:
1a- 5% of stalls in a new office, multi-family and commercial developments are designated for low emission/fuel efficient vehicles.

1b- 5% of stalls in new office and commercial developments to include spaces for preferential parking. Preferential parking could include hybrid, low emission, electric or fuel efficient vehicles and HOV/Vanpool.

2 – Allow Electric Vehicle Charging Stations to count for parking requirements for Office, Multi-family and Commercial uses.

TAB COMMENTS:
- Do not create specific regulations for low emission/fuel efficient vehicles alone
- Consider mini stalls for smart cars
- Require moped and motorcycle parking stalls

STAFF RECOMMENDS:
- Alternatives 1b and 2

ISSUE (A3): Compliance with Washington State Electric Vehicle Infrastructure (EVI) regulations requires Kirkland to provide allowance in Zoning Code for EVI charging stations.

STAFF ALTERNATIVES:
1 - Allow Commercial Electric Vehicle charging stations in all zones except residential, resource or critical areas. Amend KZC 115 and KZC 5 to show where EVI re allowed and create definition of Electric Vehicle Infrastructure (EVI).

TAB COMMENTS:
- For multi-family developments require a charging station for every 25 stalls
- Provide electric outlets at each stall for future transition to electric vehicles

STAFF RECOMMENDS:
Move forward with Alternative 1 and come back with more details

Stormwater and Landscaping

ISSUE (B1 & B2): Stormwater runoff when uncontrolled from impervious surfaces, such as roofs and paved surfaces, can lead to channel and soil erosion. The growing area of impervious surfaces in Kirkland contributes to the increase of both volume and velocity of runoff.

STAFF ALTERNATIVES:
1- Require exemptions to lot coverage in KZC 115.90 to use LID techniques, materials to achieve those same exemptions. Remove exemption for swimming pools.

2 -Remove lot coverage regulation and replace with open space minimum and pervious surface regulation.

3 -Provide a Clustered housing/Low Impact development option in the subdivision code.

4 -For Commercial and residential uses with densities greater than 5 dwelling units/acre, allow Low Impact Development (LID) improvements to be located in the right-of-way and to be counted as a part of subject property for stormwater calculations.

TAB COMMENTS:

- Balance lot coverage to have a total lot impervious surface of 40-50%
- If rain garden is installed voluntarily, reduce utility bill by $5 per month(or if multi-family $5/unit)
- 20 foot deep parking pads are required to be constructed of pervious materials
- Allow density bonus for clustered housing and required open space provisions to encourage preservation of natural features such as wetlands and steams.
- Consider putting maximum on vehicle parking

STAFF RECOMMENDATION:
Alternatives 1, 2, 3 and 4

ISSUE (B3): Development Standards do not allow pervious surfaces for driveways, private roads and parking lots. KZC requires surfaces comparable to right-of-way.

STAFF ALTERNATIVES:
1- Revise code to allow and encourage the use of pervious surfaces for driveways, private roads and parking lots. Acceptable pervious surfaces do not include gravel. They must be a proven surface whose perviousness can be determined and maintained.

TAB COMMENTS:

- Create clustered housing provisions
- Reduce curb cut widths
- Require sidewalks to be pervious, where applicable
- Allow pervious surfaces to be counted as pervious surfaces for lot coverage calculation and storm water calculations

STAFF RECOMMENDATION
Alternative 1

ISSUE (B4): Natural drainage solutions such as bio-swales, rain gardens, bio-infiltration boxes, native plants and amended soil are not mentioned in Zoning Code as an option.

STAFF ALTERNATIVES:
1 – Incorporate natural drainage solutions into landscape regulations in KZC 95.4

TAB COMMENTS:
- Increase ratio of trees required on site, but allow them to be clustered at various places to encourage shading of structures.
- Allow Low impact development features to extend into the right-of-way in planter strips and count LID feature in sites stormwater calculations.

STAFF RECOMMENDATION:
Alternative 1

ISSUE (B5): Specific soil criteria for amended soil and for compost are not specified in KZC 95.50. Therefore, it is not likely that existing soil or soil brought to site will help retain moisture or provide fertile grounds for new or existing vegetation.

STAFF ALTERNATIVES:
1 - As sites are being redeveloped, specify type of soil to amend existing soil onsite.

TAB COMMENTS: None Provided

STAFF RECOMMENDATION:
Alternative 1

ISSUE (B6): KZC doesn't provide a modification process for moderate value trees to encourage their retention. KZC 95.32 only provides for retention of high value trees.

STAFF ALTERNATIVES:
1 - Extend a modification process for moderate retention trees.

TAB COMMENTS: None Provided

STAFF RECOMMENDATION:
Alternative 1

Energy Efficiency and Independence

ISSUE (C1): There are barriers to installation of solar panels and the KZC is silent on language that could help residents and businesses place solar panels and small scale wind appurtenances on their rooftops.

STAFF ALTERNATIVES:

1a- For solar panel installations, allow panels to exceed maximum height by 20" if on flat roof and 6" on a sloped roof.

1b- For solar panel installations, allow panels to exceed maximum height by 12" if on flat roof and 6" for a sloped roof.

TAB COMMENTS:

- Provide density bonus of 5% if energy generating equipment installed on a project site
- Exempt solar panels from height regulations

STAFF RECOMMENDATION:
Alternative 1a

ISSUE (C2): The Passive House movement in the United States is now certifying homes that meet rigid standards for energy efficiency. The design and implementation using these Passive House concepts can be used when retrofitting existing structures to help them perform better and use less energy. Passive houses are designed to have exterior wall thicknesses of 12 inches and often include rigid insulation.

STAFF ALTERNATIVES:
1 – Allow up to 8 inch encroachment into setback yards for existing homes with exterior wall thickness of 4 inches. Most older homes are constructed with (2" x 4") studs and have 4 inch exterior walls. This would allow for additional insulation and exterior rigid insulation to achieve a total wall thickness of 12 inches.

2 - Allow up to 6 inch encroachment into setback yards for existing homes with exterior wall thickness of 6 inches. Most newer homes are constructed with (2" x 6") studs and have a wall thickness of 6-7 inches This would allow for additional insulation and exterior rigid insulation to achieve a total wall thickness of 12 inches.

3 – Allow up to 4 inch encroachment into setback yards for existing homes to add exterior rigid insulation.

TAB COMMENTS:

- Allow encroachment into side yards only if improving energy efficiency of existing structures, not new structures
- For new structures, allow front porches to encroach into front yard setback without affecting lot coverage

STAFF RECOMMENDATION:
Alternatives 1, 2 and 3

Public Outreach

The project's public outreach has included the creation of a web page on the Planning Departments web page. In addition, a list-serv has been established so that the public can sign up to receive additional information about Green Codes and how they can become involved in the project. A meeting has been set for May 11th 2011 to present the project to the Kirkland Alliance of Neighborhoods and gain their feedback prior to the public hearing process.

Attachments

1. Technical Advisory Board
2. TAB Meeting Notes 02/04/11
3. Staff – Draft Alternatives
4. Technical Advisory Board - Draft Alternatives
5. Neighboring cities approach to sustainable actions

Green Codes Project

Technical Advisory Board

- **Low Impact Development:**

Brian Darrow, Blue Line Group
David Hilger, Formerly Triad
Peg Stehealy, SVR
John Rubenkoenig, PACE Engineers

- **Energy Efficiency & Independence**

Galen Page, Page & Associates
Lee Beard, Page & Associates
George Ostrow, Velocipede Architects

*Meet with Technical Advisory Members at least twice

Summary of comments from 2/4/2011 Technical Advisory Committee on Green Codes

- Utilize integrated drainage plan approach.
- Predictability vs. flexibility (innovative, creativity) but make sure process is clear.
- Incentive ideas to consider:
    - Lot coverage
    - Height
    - Front yard setback
    - Non-conforming expansion limitations (save the house)
- Undertake a pilot/demonstration project
- Integrate into codes – don't separate (see Sammamish, Redmond, Fife)
- Look at other city's codes.
- If you reduce lot coverage, acknowledge but also demonstrate what you are getting
- Tree canopy will be lost with high lot coverage
- Handouts for the public
- Consider special inspections (independent)
- Consider site conditions/characteristics (not all sites are suitable for LID e.g. clay)
- Be clear on what to incentivize and what is required.
- How do you incentivize when it is required?
- How do we ensure that the incentive will result in benefits over time (e.g. keeping the rain garden)
- Think the long view 40-50 years
- Green roofs are a big challenge
- Use ROW for LID treatment/pocket parks/gardens.
- Consider sidewalks on one side only
- Abolish paved alleys (replace with pervious)
- Abolish mandatory parking
- Surface parking is bad – de-incentivize
- Reduce lot coverage
- Incent alternative energy
- If you can't do LID – have an in-lieu option (Lynnwood?)
- Identify barriers in other City, State Codes (ie Fire)
- Highlight Successful projects (provided by Technical Advisory Board)
- Consider setback reductions for green roof- Administrative Decision

(A2) -Low Emission/Fuel Efficient Vehicle Parking (Preferential Parking)

Issue: Kirkland's Parking regulations do not reflect or provide priority parking for hybrid, low emission and fuel efficient or electric vehicles.

Code Alternatives	Description	Notes	Pros	Cons
Alternative 1a:	5% of required parking stalls could be identified for low emission/fuel efficient vehicles when developing new parking lots for (Office, Multi-Family and Commercial uses). Review LEED ND Alternative Transportation section for more information.	Not required in neighboring cities, but A.2 below will require infrastructure allowances for Electric Vehicle Charging stations. This alternative would complement the WA State requirement.	Encourages non-motorized transportation and provides parking that is specific to higher efficiency vehicles.	Restricts parking to certain vehicles which could also be considered an equity issue. Where to draw line between fuel efficiency and low emission (ie motorcycles are fuel efficient but not low emission).
Alternative 1b:	5% of required parking stalls be designated for preferential parking which would also include HOV/Vanpool parking. (Office, Multi-Family and Commercial).	Many new parking lots currently have some kind of preferential parking for HOV/Vanpool Parking	Provides designated parking for higher efficiency and higher occupancy vehicles. Equity issue is eliminated.	Does not provide exclusive parking for Electric Vehicles

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Alternative 2	Allow Electric Vehicle Charging Stations to count for parking requirements. Redmond has this as their policy. (Office, Multi-Family and Commercial).	The item is discussed in greater detail in Section 3.2.01 of PSRC's Electric Vehicle Infrastructure: A Guidebook for Local Governments	Takes advantage of existing space and doesn't require more parking to be provided	Vehicles that are not electric do not have access to the parking space.

(A3) –Electric Vehicle Infrastructure (EVI)

Issue: Kirkland is not in compliance with the following Washington State requirements.

In 2009 the Washington State Legislature passed and the Governor signed into law House Bill 1481 an Act relating to electric vehicles.[1] The law addresses electric vehicle infrastructure which are defined as the structures, machinery, and equipment necessary and integral to support an electric vehicle, including battery charging stations, rapid charging stations, and battery exchange stations.

The law requires that local government development regulations allow electric vehicle infrastructure as a use in all zones except those zoned for residential, resource, or critical areas. This guidance extends the permitted use to these zones as well, although with some restrictions and limitations. The requirements apply to local jurisdictions as follows:

• By July 1, 2010, municipalities greater than 20,000 in population in King County that are adjacent to Interstate 5, Interstate 90, Interstate 405, or State Route 520, and all municipalities adjacent to I-5 in Pierce, Snohomish and Thurston Counties, must allow electric vehicle infrastructure (Kirkland has been identified as one of these municipalities).

The Washington State Department of Commerce and the Puget Sound Regional Council have developed a resource called Electric Vehicle Infrastructure: A Guidebook for Local Governments

Code Alternatives	Description	Notes	Pros	Cons
Alternative 1:	Allow Commercial Electric Vehicle Charging stations in all zones except Single Family Residential, resource or critical areas. Amend KZC 115 and KZC 5 to show where allowed and create definition of Electric Vehicle Infrastructure (EVI).	Required by WA State by June 2010. Bellevue has recently done an ordinance to comply.	Increases use of electric vehicles by allowing necessary infrastructure in	None

			Kirkland	
Alternative 2:				
Alternative 3:				

Stormwater & Landscaping

(B1 & B2) Stormwater & Landscaping Sustainable Actions– Promote low impact development through lot coverage/open space standards; by incorporate vegetated roof provisions into the zoning code; and, provide for incentives for clustered housing.

Issue – Stormwater runoff is created largely when stormwater flows uncontrolled from impervious surfaces, such as roofs and paved surfaces, leading to channel erosion and soil erosion. The growing area of impervious surfaces in Kirkland contributes to the increase of both volume and velocity of runoff. Stormwater runoff is related to three main issues in Kirkland – flooding, reduced water quality, and damage to aquatic habitat. Large amounts of stormwater runoff could lead to flooding and property damage. Additionally, sedimentation and channel erosion clogs Kirkland's surface water infrastructure, resulting in expensive maintenance and repair. Stormwater runoff carries pollutants, machine oils, heavy metals, and animal waste from lawns, roads, and parking lots into urban creeks and streams leading to poor water quality and habitat degradation.

The following alternatives promote the utilization of low impact development (LID) which is a stormwater management strategy that more closely mimics natural hydrologic patterns in residential, commercial, and industrial settings.

Code Alternatives	Description	Notes	Pros	Cons
Alternative 1:	Code amendment to Lot Coverage Section 115.90 replacing exceptions with LID techniques described in 2009 King County Surface Water Design Manual, Kirkland Addendum to the King County manual, and LID design criteria found within COK PW Pre-Approved Plans. Exemptions will be credited based on 2009 King County	May need exceptions for sites with high groundwater, steep slopes or other physical limitations.	This amendment will only affect one section of code and have City-wide implications on new construction.	No reduction to the lot coverage percentage and doesn't promote open space.

	Surface Water Design Manual.			
Alternative 2:	Remove lot coverage regulation and replace with open space minimum. Low Impact Development techniques will be used to mimic natural hydrology for developed portion of the lot.	May need exceptions for sites with high groundwater, steep slopes or other physical limitations. This would be the closest regulatory means to achieve a City-wide open space target.	Promotes open space.	Would require significant code amendments
Alternative 3:	Add optional subdivision design requirement section to KMC 22.28 for Clustered Housing (similar to Small lot single-family and Historic preservation sections). Regulations would specify Low Impact Development standards along with design requirements that maximize open space.	Is the reduced cost of infrastructure enough incentive or should density incentive be considered? Prescribe a choice of LID standards for different lot sizes.	May be a better approach for multiple parcels or larger lot. Need to determine minimum project size for LID techniques to be effective. It is Possible to achieve greater than 60% open space.	May not be used as much due to lack of available parcels or lack of large parcels in City.
Alternative 4:	As an optional compliance to achieve the desired level of infiltration LID techniques could be used in the R-O-W for commercial and residential uses with densities greater than five dwelling units per acre.	May need exceptions for sites with high groundwater, steep slopes or other physical limitations.	Allows more opportunities for LID installation, even when lot size is small.	Will require additional City staff to provide maintenance, or require

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		KMC amendment would be required.		private maintenance agreements.

(B3) – Revise standards to encourage pervious surfaces for driveways, private roads, and parking lots.

Encouraging the use of Low Impact materials in place of traditional asphalt or concrete surfaces lessens impervious surfaces, pollution generation, flooding, heat island effect and increases water quality.

There are several types of pervious surfaces allowed in the adopted surface water design manual, but they are not included in the current zoning code. The surfaces are:

- Modular grid pavement
- Grassed modular grid pavement
- Ribbon grass strips for residential driveways
- Pervious concrete and asphalt

Current zoning code requires private parking areas to be surfaced with a material "comparable or superior" to the right-of-way providing direct vehicle access (which is always impervious), and private roads to be surfaced with asphalt concrete. The code limits the use of pervious surfaces for parking lots and private roads. Pervious surfaces are allowed for private driveways, but often the same surface type is used for both the private road and the driveway. The intent of the existing code was to prevent gravel parking lots, not to limit the use of new technology.

The code for private streets includes an allowance for the Department of Public Works to authorize a modification to the standards for a paved surface on a case-by-case basis, which has allowed pervious pavement on some private streets in Kirkland. The parking lot surface code does not include this allowance. As a resource, the City of Seattle provides information to assist the development of Green Parking Lots.

There are concerns allowing pervious surfaces on public streets because of the high traffic volume and vehicle velocity. But this restriction should not limit the use of pervious surfaces on low volume and low velocity private streets and parking lots. Changing the code to allow the option of pervious surfaces for driveways, private roads, and parking lots, and then providing standard details for pervious surfaces will encourage their use.

Code Alternatives	Description	Notes	Pros	Cons
Alternative 1:	Add standard details for pervious surfaces to the Public Works Pre-Approved Plans, and revise KZC 105.10 and 105.100 to allow: • Pervious concrete/asphalt for parking lots, driveways, and access roads. • Modular grid pavement for driveways, access roads, and parking lots. • Grassed modular grid pavement for driveways, access roads, parking lots. • Ribbon grass strips for driveways. Add a similar qualifier to KZC 105.100 that allows Public Works to authorize a different surface on a case-by-case basis. Percentage of impervious is based on the 2009 KCSWDM.		Code allows pervious surfaces in parking lots, encourages their use but does not mandate it. Pre-Approved plans would provide details for applicants.	

(B4) – Revise landscape regulations to incorporate natural drainage structures and native plant requirements for commercial and multi-family sites.

Parking lots are required to have landscaping, and natural stormwater drainage options can be incorporated into these landscaped areas. Natural drainage options reduce potable water use, reduce flooding, and increase water quality. Natural drainage options include:

- Bioswales
- Rain gardens
- Bioinfiltration boxes
- Native plant lists
- Amended soil

Incorporating natural drainage options into the parking lot zoning code would encourage their use.

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Code Alternatives	Description	Notes	Pros	Cons
Alternative 1:	Revise text in KZC 95.44 to include the following natural drainage options: o Bioswales o Rain gardens o Bioinfiltration boxes o Native plant lists o Amended soil		Code encourages natural drainage options, but does not mandate it.	

(B5) – Incorporate soil amendment provisions into KZC Chapter 95.50.

Good quality soil and vegetation provide important stormwater functions including: water infiltration; nutrient, sediment, and pollutant adsorption; sediment and pollutant bioinfiltration; water inflow storage and transmission; and pollutant decomposition. These functions are largely lost when development strips away native soil and vegetation and replaces it with minimal topsoil and sod. Not only are these important stormwater functions lost, but such landscapes themselves become pollution-generating pervious surfaces due to increased use of pesticides, fertilizers and other landscaping and household/industrial chemicals, the concentration of pet wastes, and pollutants that accompany roadside litter.

The existing KZC 95.50 states the organic content of soil *"shall be as necessary to provide adequate nutrient and moisture-retention levels*". This text is vague and therefore difficult for the applicant to use and the inspector to verify.

Our NPDES permit through WA State Department of Ecology and the adopted surface water design manual require specific soil criteria for amended soil, and for the compost used to amend the soil. This requirement applies to landscaped areas of projects 1 acre or larger. Amended soil must have a minimum organic matter content of 10% dry weight in planting beds (5% organic matter content in turf areas), a pH from 6.0 to 8.0 (or matching the pH of the original undisturbed soil), and the compost used to amend the soil must have an organic matter content of 35% to 65%, and a carbon to nitrogen ratio below 25:1.

Changing this code would extend the same requirements to smaller sites. It would provide specific organic soil requirements for applicants and inspectors, and provide consistency with the adopted surface water design manual, municipal code, and zoning code.

Code Alternatives	Description	Notes	Pros	Cons
Alternative 1:	Revise text in KZC 95.50 to include all amended soil requirements (per Ecology): • 10% organic matter in amended soil • A pH from 6.0 to 8.0 (or matching the pH of the original undisturbed soil) • Compost used to amend the soil must have an organic matter content of 35% to 65%, and a carbon to nitrogen ratio below 25:1.		Code requirement will increase the likelihood of obtaining healthy vegetation, and will be easy for the inspector to verify from soil delivery tickets.	Adds greater cost to project, and more staff time (staff currently does not verify soil amendments when a tree is planted).

(B6) Allow modifications to setbacks for moderate retention trees that are retained during development. The current Zoning Code (below) supports modifications for high retention trees. The modification could be extended to moderate retention trees as an alternative mechanism to retain viable trees.

Revise KZC 95.32 Incentives and Variations to Development Standards

In order to retain trees, the applicant should pursue provisions in Kirkland's codes that allow development standards to be modified. Examples include but are not limited to number of parking stalls, right-of-way improvements, lot size reduction under Chapter 22.28 KMC, lot line placement when subdividing property under KMC Title 22, Planned Unit Developments, and required landscaping, including buffers for lands use and parking/driving areas.

Requirements of the Kirkland Zoning Code may be modified by the Planning Official as outlined below when such modifications would further the purpose and intent of this chapter as set forth in KZC 95.05 and would involve trees with a **high** retention value.

1. Common Recreational Open Space. Reductions or variations of the area, width, or composition of required common recreational open space may be granted.

2. Parking Areas and Access. Variations in parking lot design and/or access driveway requirements may be granted when the Public Works and Planning Officials both determine the variations to be consistent with the intent of City policies and codes.

3. Required Yards. Initially, the applicant shall pursue options for placement of required yards as permitted by other sections of this code, such as selecting one front required yard in the RSX zone and adjusting side yards in any zone to meet the 15-foot total as needed for each structure on the site. The Planning Official may also reduce the front or side required yards; provided, that:

   a. No required side yard shall be less than five feet; and

   b. The required front yard shall not be reduced by more than five feet in residential zones. There shall not be an additional five feet of reduction beyond the allowance provided for covered entry porches.

4. Storm Water. Requirements pertaining to stormwater may be varied if approved by the Public Works Official under KMC 15.52.060.

5. Additional Variations. In addition to the variations described above, the Planning Official is authorized to require site plan alterations to retain trees with a high retention value. Such alterations include minor adjustments to the location of building footprints, adjustments to the location of driveways and access ways, or adjustment to the location of walkways, easements or utilities. The Planning Official and the applicant shall work in good faith to find reasonable solutions.

Code Alternatives	**Description**	**Notes**	**Pros**	**Cons**
Alternative 1:	Revise Chapter 95.32.5 to allow front or side yard setbacks to be reduced when a **moderate** retention tree is saved during development. Require an equal of amount of space be reduced from allowed lot coverage for proposed setback encroachment	High retention trees have this option	More tree retention of significant trees	Potentially less setbacks from street
Alternative 2:				
Alternative 3:				

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Energy Efficiency & Independence

(C1) – Create regulations that incentivize small scale wind, photovoltaic, solar hot water and passive solar design. The City of Seattle has provided some guidance for Solar Energy Systems that help explain how solar panels and solar hot water heater work.

Issue: There are barriers in the Zoning Code that if changed could help residents or businesses place Solar panels on their rooftops and generate clean, green energy or heat hot water for domestic uses.

Code Alternatives	Description	Notes	Pros	Cons
Alternative 1a:	For Flat roofs allow all solar panels up to go 20 inches above maximum height in Use Zone. For sloped roofs allow panels to go 6 inches above maximum height for Use Zone. Flat roof = 20" Height Exemption Sloped = 6" Height Exemption	Panels are not efficient if placed horizontal on flat roof. Flat roof is defined as slope of 1/12 or less	Encourages panels to be sited for maximum energy generation	May affect some views. Additional structural costs.
Alternative 1b:	Allow Solar panels on Flat roofs to go 12 inches above maximum height in Use Zone. For sloped roofs allow panels to go 6 inches above height maximum.	Panels could still have efficiency, but it would be lessened more on flat roofs	Encourages panels to be sited for acceptable energy generation	May affect some views. Additional structural costs

GREEN CODES DRAFT ALTERNATIVES – PHASE 1

Green Infrastructure

(A1) –Bicycle Storage

Issue: In Kirkland the ratio of bike stalls to parking stalls for new development is 1 bike stall for every 12 vehicle parking stalls. Covered bicycle storage is not a requirement in the Zoning Code or the design regulations. This may cause fewer people (customers and employees) to make sustainable alternative transportation choices.

Code Alternatives	Description	Notes	Pros	Cons
Alternative 1:	Bicycle Storage required when building new multi-Family, Office or Commercial development. Storage size is percentage of buildings gross floor area	Neighboring cities require bike racks but not bicycle storage. Kirkland's CTR does not require	Encourages non-motorized transportation	Additional costs or design to provide storage
Alternative 2:	If Covered Bicycle storage is provided, reduce vehicle parking by one or more stalls Look at LEED ND Alternative Transportation for information.		Costs less to provide basic storage than parking stall. Encourages employees to ride to work and lessens parking load on public streets.	Perceived less parking in development

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Alternative 3:				

(C2) – Allow building envelopes to encroach into setback yards for existing homes or buildings so that exterior rigid insulation can be increased and for new structures that exceed the WSEC requirements. Some of the benefits of Super insulation are described in this link along with how it works with retrofitting older homes.

Issue: The Passive House movement in the United States is now certifying homes that meet rigid standards for energy efficiency. The design and implementation using these Passive House concepts can be used when retrofitting existing structure to help them perform better and use less energy.

Existing Structures-

Code Alternatives	**Description**	**Notes**	**Pros**	**Cons**
Alternative 1:	Allow up to 8 inch encroachment into setback yards for existing older homes (2 x 4 stud construction) to add additional insulation and exterior rigid insulation. Passive House – Wall Section as an example	Passive Houses have 12 inch wall thickness at a minimum. Must maintain 3 feet from Property line. NEED PHPP certification.	Helps building operate more efficiently	Perception of less separation between structures
Alternative 2:	Allow up to 5-6 inch encroachment into setback yard for newer existing home (2 x 6 stud construction) to add additional insulation and exterior rigid insulation. Most houses to current code have walls that are 7 inches thick	This would allow for adherence to an important Passive House prerequisite	Helps building operate more efficiently	Perception of less separation between structures
Alternative 3:	Allow up to 4 inch encroachment into setback yards for existing homes to add exterior rigid insulation.	Would not meet prerequisite, but would be a noticeable improvement to building envelope	Helps building operate more efficiently	

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TECHNICAL ADVISORY BOARD – DRAFT ALTERNATIVES

Green Infrastructure

(A.1) –Bicycle Storage and low emission and fuel efficient vehicle parking

Code Alternatives	Description	Notes	Pros	Cons
Alternative 1:	Multifamily: Bicycle storage areas required to be part of architecture/building and not prefab units in open spaces.			
Alternative 2:	Multifamily: Require minimum of 1 covered bicycle space per unit.			
	Consider alternative locations for covered storage- Consider cost to developer			
Alternative 3:	No special zoning regulations for low emission vehicles. This was mentioned twice.			
	Require moped and motorcycle parking stalls.			
	Mini stalls?			
	Allow reduced depth parking stalls for cars such as the smart car. Allow a certain percentage of these stalls. Reducing parking stall depth reduces lot coverage and increases open space.			

(A.2) –Electric Vehicle Infrastructure (EVI)

Code Alternatives	Description	Notes	Pros	Cons
Alternative 1:	Multifamily: Require charging stations in each project. 1/25 parking stalls or outlets at each parking stall for future transition.			
Alternative 2:				
Alternative 3:				

Stormwater & Landscaping

(B1) – Promote low impact development through lot coverage/open space standards; by incorporate vegetated roof provisions into the zoning code; and, provide for incentives for clustered housing.

Code Alternatives	Description	Notes	Pros	Cons
Alternative 1:	Allow an exchange of setbacks for incorporating a rain garden, ie: If you add a rain garden to the back yard the front setback can be decreased by 5 feet and the rear yard increased by 5 feet.	Adds flexibility and non-linear development . Consider side yards	Flexibility	Retention and Maintenance of feature

	Consider better balance of lot coverage and LID to end with a total imperviousness between 40 -50%.		Developers may have issues with lowering Lot coverage allowance esp with lower FAR on lots that are averaged	
Alternative 2:	If you add a functioning, certified rain garden, your Kirkland utilities bill is reduced by $5 per month per residence or multifamily unit. (dollar amount?)	Look at linkages to other LID features	Less load on SW system. Helps homeowner. Effective on medium parcels, not just large ones.	Doesn't incent developer as they don't see financial benefit.
Alternative 3:	All single family garage driveways shall have a minimum 20ft x 20ft pervious paving section or equivalent area.	Make this a requirement. Pushes things forward much quicker.	Could encourage more LID. IE.Walkways and patios	Some soils and topography(consider grade thresholds) might make it impossible. May cost more than traditional and may have maintenance costs
	Encourage driving strips			
	Multi-family: If 75% of the roof area is a vegetated roof then the developer can add an additional floor.	5 foot Height bonus for flat roof with green roof. SeattleGreen Factor incentive. Provide diagrams		View blockage. Requires covenant.

(B2) – Provide incentives for single family regulations to encourage clustered housing.

Code Alternatives	Description	Notes	Pros	Cons
Alternative 1:	Require cottage housing developments to have a perimeter native tree screening planting plan.	Consider adding to existing cottage housing code or multifamily structures. Kirkland specific award for creating habitat.	More Trees (habitat) in the neighborhood	
Alternative 2:	For properties that have natural features such as streams, wetlands, and ponds, allow for denser cluster housing at the setback edges. Many times these properties are ignored for development because of these critical areas when they could be considered incredible opportunities for developers to have natural habitats on the properties and the public has a preserved natural drainage environment with caretakers.	Look at Sammamish. Enhance lower functioning wetland.	Density bonus provided.	
Alternative 3	Maximum parking requirements			Community perception of lack of parking provided
Alternative 4:	For duplexes and triplexes allow one parking space per unit regardless of the bedroom count. Require one bicycle storage space at a covered area per bedroom.	Water quality for extra parking provided above requirement. Hanging bikes	Encourages alternative transportation and reduces costs	May have market implications

Stormwater & Landscaping Continued

(B3) – Revise standards to encourage pervious surfaces for driveways, private roads and parking lots

Code Alternatives	Description	Notes	Pros	Cons
Alternative 1:	Change road standards for cluster developments. Do not require sidewalks on both sides of roadway. Reduce width of roadway to minimum required for slower movement, no street parking, and two way traffic. Allow for more open space, tree planting areas, and rain gardens. The small road areas could reduce expense for larger detention systems. This was mentioned twice.			
Alternative 2	Reduce curb cut widths, front yard setbacks and increase rear setbacks to allow for natural drainage structures			
Alternative 3:	Sidewalks located in parking lots need to be pervious.			
Alternative 4:	Onsite pervious surfaces s/b counted at 50% for lot coverage purposes and storm water calculations		Facility may decrease in size	

(B4) – Revise Landscape Regulations to incorporate Natural drainage structures and native plants for commercial and multi-family sites

Code Alternatives	Description	Notes	Pros	Cons

Alternative 1:	Increase ratio of trees per parking stall but allow trees to be clustered at various parts of the site, including performing as building shading.	Require in addition to existing regulations.	Increases tree canopy Community asset.	More costs
Alternative 2:	Allow LID features to extend into planter strips to offset stormwater calcs for entire site	Could have greater coverage on own lot if feature is provided in ROW	Public Awareness. Should be in same basin.	

Energy Efficiency & Independence

(C1) – Create regulations that incentivize small scale wind, photovoltaic, solar hot water and passive solar design

Code Alternatives	**Description**	**Notes**	**Pros**	**Cons**
Alternative 1:	Multifamily: Add energy generating equipment to a project allows an increase in unit count by 5% without additional parking requirements.	Consider increase in mass.	Shifting cost from parking to PV etc	
Alternative 2:	Exempt solar panels from Height regulations	Consider increase in mass with neighbors solar access in mind		

(C2) – Allow building envelopes to encroach into setback yards for existing homes or buildings so that exterior rigid insulation can be increased and for new structures that exceed the WSEC requirements.

Code Alternatives	**Description**	**Notes**	**Pros**	**Cons**
Alternative 1:	Allow increase into side yards only for improving the energy efficiency of **existing** structures.	2-3 inches of exterior.		
Alternative 2:	For new projects increase the encroachment of porches into the front yard by 1ft. without affecting lot coverage.			

Neighboring Cities Approaches to Sustainable Actions

Green Infrastructure - Bellevue

Bicycle Storage facilities

- **50% of bicycle stalls required to be covered, but no storage for bicycles.**

20.25D.120 Parking, Circulation, and Internal Walkway Requirements

G. Bicycle Parking.

Office, residential, institutional, retail, and education uses are required to provide bicycle parking pursuant to the following standards:

1. Ratio.

   a. One space per 10,000 nsf for nonresidential uses greater than 20,000 nsf.

   b. One space per every 10 dwelling units for residential uses.

2. Location. Minimum bicycle parking requirement shall be provided on site.

3. Covered spaces. At least 50 percent of required parking shall be protected from rainfall by cover.

4. Racks. The rack(s) shall be securely anchored and a bicycle six feet long can be securely held with its frame supported so the bicycle cannot be pushed or fall in a manner that will damage the wheels or components.

5. Size Requirement. Each required bicycle parking space shall be accessible without moving another bicycle.

Low Emission Vehicle parking

- None required

Electric Vehicle Infrastucture (charging stations)

- No requirements to build them, but permitted (Ordinance is being adopted)

Energy Efficiency & Independence

Solar PV, Solar H2O, Small Scale Wind turbines

- No Specific regulations for or against

Passive House technologies

- Not Addressed

Green Infrastructure - Issaquah

Bicycle Storage facilities

- **Bicycle stalls required, but covered stalls or bicycle storage are not provided for.**

I. Bicycle Parking: Bicycle parking shall be provided as follows:

1. Quantity: All sites required to provide nonmotorized facilities shall provide bicycle parking spaces equal to five (5) percent of required automobile parking parking spaces for the first three hundred (300) required auto stalls and one (1) percent of auto stalls in excess of three hundred (300). Only customer and employee parking spaces shall be used to determine this requirement. In no case shall the amount be less than two (2) bicycle spaces.

2. Location: Bicycle parking shall be placed in a publicly visible location within fifty (50) feet of a primary building entrance. Bicycle parking shall not block pedestrian use of a walkway. Shopping centers or other multibuilding developments may group bicycle parking in a unified location, provided the location is consistent with the other location requirements.

3. Exceptions:

a. Sites requiring eight (8) or fewer auto stalls are exempt from bicycle parking.

b. The Planning Director/Manager may reduce the quantity of bicycle parking spaces when it is demonstrated that bicycle activity will be limited at that location, but in no case can the amount be reduced to less than two (2) bicycle spaces.

c. The Planning Director/Manager may require additional spaces when it is determined that the use or its location will generate a high volume of bicycle activity. Such a determination will include but not be limited to the following uses:

(1) Park/playfield;

(2) Marina;

(3) Library/museum/arboretum;

(4) Elementary/secondary school or colleges/universities;

(5) Sports club; or

(6) Retail business (when located along a developed bicycle trail or designated bicycle route). (Ord. 2587 § 3 (Exh. B2), 2010; Ord. 2447 § 56, 2005; Ord. 2283 § 3, 2000; Ord. 2108 § 9.3, 1996).

Low Emission Vehicle parking

- **None provided**
-

Electric Vehicle Infrastucture (charging stations)

- **Required by Washington State Law**

Energy Efficiency & Independence - Issaquah

- Solar PV, Solar H2O, Small Scale Wind turbines. Some provisions are made in zoning code and are listed below.

18.07.137 Alternative energy systems.

A. Purpose and Intent: This section is established to:

1. Promote clean energy production by citizens and businesses;

2. Ensure that alternative energy structures are compatible with the principal structure and development on adjacent properties;

3. Provide options to traditional energy use; and

4. Promote reduction of energy use within the City.

B. General Approval Criteria: Alternative energy systems shall meet all of the following criteria:

1. Setbacks: Alternative energy systems shall not be located within any building setback or required setback.

2. Compliance with International Building Code: Any installation of an alternative energy system shall comply with any and all applicable provisions of the International Building Code.

3. Compliance with National Electrical Code: Any installation of an alternative energy system shall comply with any and all applicable provisions of the National Electrical Code.

4. Utility Notification: No alternative energy system shall be installed unless evidence has been provided to the City of Issaquah that the utility company has been informed of the customer's intent to install an interconnected customer-owned power generation system. Off-grid systems shall be exempt from this requirement.

C. Geothermal Alternative Energy Approval Criteria: In addition to the approval criteria established in subsection (B) of this section, geothermal alternative energy systems shall comply with the following standards:

1. Location:

a. Ground-source: Geothermal alternative energy systems (geothermal systems) shall be located entirely within the subject property, or within appropriate easements.

b. Water-source: The heat-exchanger part of a geothermal system may be located within Lake Sammamish. No portion of a geothermal system shall be located within a stream.

2. Critical Aquifer Recharge Area: Geothermal systems within the critical aquifer recharge area (CARA) shall comply with all requirements of IMC 18.10.796, Critical aquifer recharge areas (CARAs). Vertical or deep-bore geothermal systems are not permitted within Class 1 CARAs.

3. Installation: Installation of geothermal systems shall comply with all Building Department requirements, and applicable state laws and codes.

4. System Design: Open-loop geothermal systems are prohibited.

D. Wind Alternative Energy Approval Criteria: In addition to the approval criteria established in subsection (B) of this section, wind alternative energy systems shall comply with the following standards:

1. Purpose: Wind alternative energy systems (wind turbines) are allowed as an educational demonstration project to determine how the use of small wind turbines may affect the demonstration project site, surrounding properties, and the city as a whole.

2. Location: Wind turbine demonstration projects shall be located only in zones where expressly permitted by IMC 18.06.130, Table of permitted land uses. Wind turbines shall not be located in residential zones.

3. Setbacks: Wind turbine demonstration projects shall be set back a minimum of one hundred (100) feet from the property line of any existing residential use.

4. Size of system: The maximum diameter of rotor blades shall be no more than ten (10) feet.

5. Clearance of blades: No part of a wind turbine shall extend within fifteen (15) feet of the ground. No blades shall extend over parking areas, driveways, or sidewalks. (Ord. 2558 § 4 (Exh. B3), 2009).

18.07.060 Building height.

A. Purpose: The purpose of the building height standard is to balance lot size, building bulk, and open space area, and ensure compatibility of architectural character and scale with the surrounding area.

B. Measuring Height:

1. Nonshoreline Areas: Building or structure height shall be measured from the average grade of the existing or finished grade, whichever is lower, to the midpoint of the highest gable of a pitched or hipped roof with a minimum 4:12 pitch and a maximum of 12:12 pitch, or the highest point of the coping of a flat roof. All parts of the roof extending above the base building height shall be a minimum 4:12 pitch unless specifically excepted in subsection (B)(4) of this section. Gabled dormers may comprise no more than fifty (50) percent of the total roof area as measured in plan view. No portion of a shed roof shall extend above the base building height limit. An architectural feature may not be used to measure or establish building height.

2. Shoreline Areas: Building or structure height shall be measured from the average of the natural or existing topography of the portion of the lot under the building/structure.

3. Additional Height: In all zoning districts as established by the District Standards Table (IMC 18.07.360), building/structure heights may exceed the base height requirement if approval criteria are met, as established by Administrative Adjustment of Standards section (IMC 18.07.355(A)) for height up to and including fifty (50) feet and by IMC 18.07.355(B) and (C) for height adjustments

over fifty (50) feet in all districts; and provided, that such provision shall not apply to areas of the zoning district governed by the Shoreline Master Program.

4. Height Exceptions: The following uses and features shall not be subject to height limitations and are not required to be reviewed through an Administrative Adjustment of Standards, provided they are necessary and architecturally integrated:

a. Water towers;

b. Power transmission towers;

c. Chimneys and smoke stacks to the minimum required by the Building Code;

d. Flag poles;

e. Wireless communication towers, including telescoping antenna (except those towers regulated in residential districts). See Table of Permitted Uses (IMC 18.06.130);

f. Scenery lofts and flytowers;

g. Mechanical penthouse or ornamental screening for rooftop heating, ventilating, and air conditioning equipment, and stair towers (to the minimum required by the Building Code);

h. Elevator shafts to the minimum required by Code;

i. Solar panels or arrays, provided all the following criteria are met:

(1) The solar panel or array is not within a required setback, or on a structure within a required setback;

(2) The height of the solar panel or array is the minimum necessary to generate usable energy;

(3) The solar panel or array shall not cause excessive glare or reflections so as to constitute a hazard to pedestrians and/or vehicular traffic;

(4) The support structure of a roof-mounted solar panel or array is screened by extended parapets or other architecturally integrated screening; and

(5) The solar panel or array complies with the approval criteria in IMC 18.07.137, Alternative energy systems;

Passive House technologies

- None listed in Zoning or building code

Green Infrastructure - Redmond

Bicycle Storage facilities

- Not addressed

Low Emission Vehicle parking

- Not Addressed

Electric Vehicle Infrastucture (charging stations)

- Allowed per ordinance. 9 charging stations currently in place throughout Redmond
- Charging Station parking stall counts as part of sites overall parking requirements

Stormwater and Landscaping

Items addressed in our Sustainable Actions Matrix (B1,B2,B3,B4 and B5) are discussed.

- Low Impact Development in chapter 8 of the Redmond Municipal Code
- Green Building and Green Infrastructure (LID) Incentive Program in chapter 20C.30.57 of Redmond Municipal Code.

Energy Efficiency & Independence

- Solar PV, Solar H2O, Small Scale Wind turbines – No provisions in zoning code.
- Wind Turbines allowed to exceed maximum height by 15 feet
- No Passive House technologies described in Redmond's Code