We began this project by researching an urban space in Seattle. This gave us an opportunity to see Seattle as a team of twelve students to investigate an interesting area of a downtown. The areas of interest include the Belltown neighbourhood, the Olympic Sculpture Park and Pike Place Market. The Olympic Sculpture Park is a revamped industrial site that now serves as a recreational public space that connects downtown Seattle with the water. Pike Place Market has always been the thriving energetic hub of the city for shopping and leisure. We recognize that these as two exemplary public spaces. Our objective was to implement an architectural intervention to a public space that stitched Belltown together with Olympic Sculpture Park and Pike Place Market. Despite the temptation to simply build something, we constantly remind ourselves that if you build it, they might not come. As interaction design students we understand when our thoughts, ideas and values translate into our work as info-models, prototypes and ideas. We've learned from this process that design should not jump to the solutions. Therefore, when we look at design in large scale such as of a city, it is important to ask whether the city reflects the urban planner’s ideas, thoughts and values rather than from a standardized method.

If we think about how important the jobs of zoologists and ecologists studying how to provide animals proper conditions, we can understand why determinants of our own space is vital. If an animal is given too little, or too much, or the wrong space, it will become ill, fail to reproduce and die. (Devlin, 2001) Architects and urban planners likewise have a crucial role to study and design the environment that people will live in. The relationship between people and space is essential because it is integral to our survival and existence. Our minds have evolved around the ability to understand our environment to accommodate our needs in finding food, shelter and mates. (Devlin 2001) How the space translates into a mental image dictates our cognition. Spatial cognition researches how people learn, understand and navigate through the world using mental representations of space. To provide a better insight into what people need in their living space, psychology can present methodologies such as spatial cognition to understand the application of urban planning.

Looking at urbanism in social sciences specifically in spatial cognition and psychology encourages us to be critical and to question what is around us rather than being passive recipients. Specific references to our project in Seattle can help us understand the concepts and application of cognitive principles. We introduce social sciences to examine design choices in existing urban spaces and
urban development. Design should adopt the methodologies of psychology to research urban planning. Psychology is a scientific study that strives to gain knowledge of human thought through empirical research. However, this area of research neglects the actual application of the knowledge derived from the research. We can say the same for architecture and urban planning in the apparent lack of consideration in researching spatial cognition in context. Jane Fulton Suri the chief creative officer at IDEO incorporates the two disciplines of psychology and design to successfully achieve a greater understanding in the interactions between people and objects such as in her book Thoughtless Acts. Using a similar strategy, we hope to capture quality concepts into our project.

Spatial cognition is the study of the interrelationships between people, space and objects. The study according to environmental psychologist, Ann Devlin in Mind and Maze-Spatial Cognition and Environmental Behavior, requires an interdisciplinary approach involving anything from psychology theories to architecture. (Devlin, 2001) Relevant perspectives from social sciences include environmental, cognitive, and social psychology. By studying multiple disciplines, it can directly inform our decisions and design processes. This ideal is similar to architectural designers Weiss/Manfredi’s use of peripheral vision where disciplines mix and inform each other such as art and engineering. In their project at Barnard Nexus, they designed a building for a College campus which departments are seamlessly interconnected into the building without segregation. Urban planning relates to spatial cognition because they are both about managing those relationships between space, people and objects. Therefore we must understand the relationship between spatial cognition and urban planning to implement design at a city scale. For example, urban planning is the application of engineering and architecture to develop systematic environments for residents and for visitors. Spatial cognition studies the relationships between the the people, the space and the structures.

To give you a brief overview of related topics in psychology, it is important to keep in mind that psychology and design have very different methods of researching yet have the same topics of interest. By looking at ways to combine the two fields, the results should be complimentary such as the work of Jane Fulton Suri. The investigation of methods of psychology should inspire alternative perspectives into design.
Specific examples from Seattle

In Seattle we were able to look at a specific derelict space to study the implications of structural changes on developing public space. Changes to the infrastructure in a neighbourhood occur most commonly because of the growing needs of transportation. For instance, in the site that we are studying, there is a highway that cuts directly through Belltown, a thriving neighbourhood in Seattle. The dark underside of the structure and the heavy unorganized traffic that comes off the highway causes the residents and visitors to avoid the site that we are studying. The traffic from the Alaskan Highway, along with the intrusive noise from the highway spills directly into Western Avenue in the middle of the neighbourhood. According to Devlin (2001), a city, through infrastructure development, can become “illegible”, or visually incomprehensible. In other words, when the streets of a neighbourhood don’t show apparent relationships to each other or their arrangement simply does not make sense, the neighbourhood does not make sense visually. The same way that we can’t read writing because it is too messy, too complex, or foreign to our knowledge, it exceeds our current ability to understand. However messy or complex social centers such as Pike Place Market do not necessarily translate as illegible in terms of spatial cognition. It is logic and hierarchy in the placement of streets, landmarks and infrastructure that must be apparent so that we can easily understand our environment. “A city that functions well gives choice to its inhabitants, and legibility provides at least one basis for making spatial choices” (Devlin, 2001). The spatial choices of a “legible” city provide physical comfort to its residents. (Devlin, 2001) Kevin Lynch, an urban planner Devlin cites in her book, reinforces the importance of a legible city. “Orientation in space (and time) is the framework of cognition. We take delight in physically distinctive, recognizable locales and attach our feelings and meanings to them. They make us feel at home, grounded.” (Lynch, 1960)
Further examples that support the premise that well designed cities reflect cognitive principles include the growing use of the grid, principles of street, and hierarchy in urban planning as explained in the following examples. The concept that mental structures can be reflected into physical structures is supported by the evidence of values exchanged as city designs in history. Curran (1983) begins by describing city organizations in the middle ages, we could see cities in a closed order (a walled city). During the Renaissance, cities provided a structured order with influences from Greek and Roman culture. And in the Modern era, the city had an open order. Concepts of hierarchy and scale began during Renaissance leading to the use of the grid. Architecture and urban planning was also used as an extreme method to convey an idea at the time like an art piece. These are examples of how certain values and principles of the time of have the power to be turned into timeless organizations into the form of a city. In Seattle, the decision to apply infrastructure right through the site puts the vehicle access at a higher level of importance over pedestrians. As a consequence the space suffers from lack of pedestrian pathways and usage. Urban planning should be mindful of such effects yet still be able to support the needs of vehicular access throughout the city.

Even though the grid pattern is used for streets, differentiation is good. “Where paths lacked identity, or were easily confused as another, the entire city image was in difficulty.”-Devlin (2001). Similar to many patterns provided in A Pattern Language, a city needs to be composed of a variety of streets for shopping, homes, and cafes. (Alexander, 1977) The use of a street in urban planning should not be underestimated. It is important that one must be able to distinguish one street from another as the grid pattern divides the city into multiple components. Devlin (2001) mentions that even the design of Disneyland (as a simulated micro city) is successful in providing distinct hubs so guests are able to orient themselves throughout the park.

A street should provide more than distinction but also accessibility, physical comfort and safety, participation, publicness, definition and livability (Jacobs, 1993). It is suggested that a neighbourhood should have streets that encompass these qualities to achieve identity and a positive experience. An example of this is Via del Corso in Rome. This relates to the Seattle project in identifying the problem with pedestrians avoiding the derelict space in Belltown. People walking towards Pike market deliberately avoid the dark and disorganized space underneath the highway. There is the issue of safety and comfort with the homeless people looking for work at the Latino day work facility located at the center of site A. According to the principles of Kevin Lynch (1960) “legibility” must combine diversity with order. “Nothing is experienced by itself, but always in relation to its surroundings, the sequences of events leading up to it, the memory of past experiences.” His cognitive perspectives are derived directly to the principles of Gestalt and concepts of good form. Self-organizing aspects of sensory experience principles such as proximity, similarity, continuity, common motion, closure, and good figure have undeniable application to urban planning. (Devlin, 2001)
Currently expanding cities have become so extensive that it became an incredible challenge to conceptualize. According to Devlin (2001), the scale has exceeded our mental framework. It can only be articulated as an urban landscape composed of contrasting elements of built-up and open sections. We need to chunk or cluster sections of the city in order to manage the scale. A hierarchy of units allows us to form meaningful relationships between areas of a city. Clusters and communities are also concepts in A Pattern Language by Christopher Alexander relating to growth and identity. The use of chunking or clustering is a cognitive strategy to retain large bits of information in long-term memory structures (Miller, 1956). This is a well-known information theory by George Miller (1956) in his paper The Magical Number Seven, Plus or Minus Two: Some Limits on our Capacity for Processing Information he coined the term chunking. By breaking down a city into groups like neighbourhoods, it can help increase “legibility” of a city. Another method to break the city down into meaningful units is with the application of a grid. Streets and paths are the main arteries for separating sections in a city. The grid pattern was quickly adapted which allowed for fast colonization. It was fuelled by industrial expansion of the 1900's. (Devlin, 2001)

Lynch (1960) provides five structural elements of a city that deals with understanding spatial cognition. One of the main elements is paths. The greater the familiarity a person has of an area reflects how they use the paths. He describes familiarity as creating a layering process. If a visitor is in an unfamiliar site, they will recognize the area as regions or districts. When one becomes familiar to the area, they will be able to acknowledge paths. For people with complete knowledge of the area, landmarks are used as points of orientation. This provides a hierarchy of visual cues used as for conceptualization for the necessary mental representation of a neighbourhood. Lynch (1960) also brings up an interesting dynamic between environmental form and mental structure. Mental structures of an urban developer can manipulate environmental form, but environmental form can also influence mental representations. This is an element that we should consider into the Seattle project because currently there is no existing pathway to Pike Market Place or to the Seattle Sculpture Park from Belltown, yet there is a need for one. How do we create a pathway for the residents and for visitors to use even if they were not familiar with the area? What landmarks will people use to orient themselves around the public space? How do we create a space that residents will know like the back of their hands?

A place must not only fit the structure of our bodies. It must fit the way in which our minds work: how we perceive and image and feel...there are regularities in these perceptions due to the structure of our senses and our brains. We are all engaged in identifying the features that surround us, organizing them into images, and connecting those images to the other means we carry in our heads” (Lynch & Hack, 1984)
Further research into this field is necessary as this has been only a surface level investigation through a single main source into spatial cognition. Another supplement to understanding cities is A Pattern Language: Towns, Buildings and Construction by Christopher Alexander as suggested by Ann Devlin as a philosophical approach to urbanism using cognition. Alexander's (1977) patterns do not all occur at once. Like urban planning, the patterns slowly emerge like an organic form. "A city is a natural phenomenon as well as a work of art in the environment. Form in nature is not a result of preconceived order. It evolves as it grows, or happens, as mountains develop by up thrusting, boulders by glacial dropping." (Halprin, 1972, p220)

A city is comprised of a complex system that needs to support neighborhoods, streets, and infrastructure. It is a delicate organization that directly affects people as they live, work, and move in the city. Research into spatial cognition is necessary to inform major decisions of a city planner or urban developer. It is a tool that can improve people's experience to be more meaningful and seamless in a city.

References: