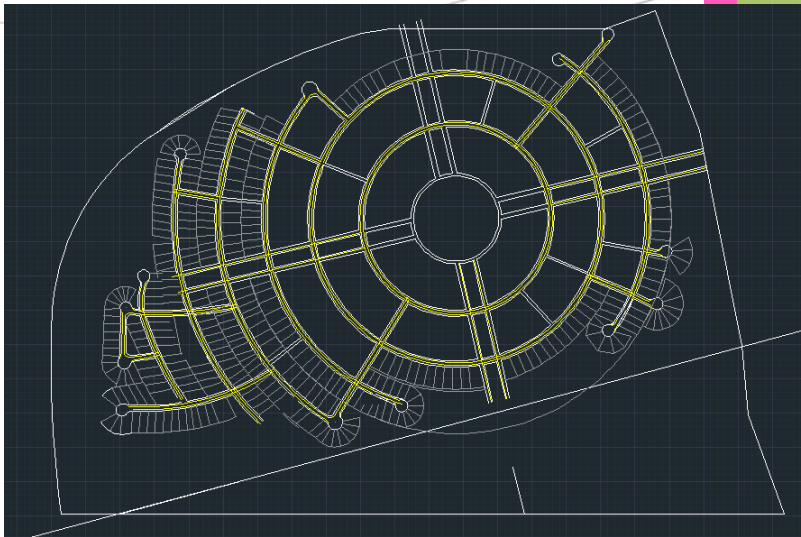


York University Land Endowment Plan



2014



Registration

Number: 47734135

Disclaimer

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Executive Summary

In nine weeks, we have put together the final report on York University Land Endowment Plan. The report provides a detailed design for solutions to deal with need of the University. This includes meeting resident perception; preserve culture identity of the campus area and protect the environment in the city. The project is designed to provide the university with the best alternative that is efficient and cost effective. The report provides the cost benefits of the each project as well as its environmental impact of such project.

The report is summited to fulfill the requirement of Make & Rent project. It creates a concept plan and some detail designs for a 69.79 ha (173 acre) area currently used for agricultural research adjacent to the York University, west of the Jane Street and south of 407 and Commercial area by using our engineering, planning and drawing abilities.

The design group is formed by three undergraduate students who taking civil engineering and urban design. The group members are really enjoying this competition with putting lots of efforts by using the knowledge learnt from schools and internships. Moreover, the members are looking forward to learning and gaining some good experiences from this nice competition opportunity. This design, "York University Land Endowment Plan", is going to develop a community with innovative ideas that locates at the North West of the York University to fulfill all the requirements of "Make Rental Happen Challenge". The targeting design site is around 400 meters away from the York University main campus area and sits just north of Blacksmith Public School. The design contains four main aspects to build this completed community, which are "land use and neighborhood arrangements", "road building and traffic designs", "walkability and spaces" and "sustainable developments with financial analysis". Methods of analysis and design include civil engineering analysis of road and residences building; urban planning research and consideration of traffic networks and land use arrangements; and, financial calculations of budgets and developing options. The group is mainly using "AutoCAD" and "Sketchup" to provide the blueprints and imaginary images of this design. All the building, roads, parking lots and green spaces' designs will follow the related standards of local acts and zoning bylaws. This design is presented to achieve the goal of building a sustainable

and beautiful urban community with high quality living standard, good traffic operating efficiency, ecofriendly with pedestrian friendly and active commercial trends. The group is hoping the creation of this university land endowment project is able to offer some useful and valuable ideas to the city and the university

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Introduction:

The main objective of the design is to develop a community that is both progressive and beautiful. By Looking at the land and the surrounding development types it is simple to come up with a way to best approach the surrounding development that would maintain a high degree of aesthetics while also preserving ideas for a progressive community. The surrounding developments are the York University, Being close to the university, potential is realized that it might be wise to attract students to the neighbourhood, making the area a possible school based community, bringing economic gain to the university as well as making a fresh and progressive community. Though it could not solely be a student community; to be a functioning neighbourhood the area also had to contain all social strata to avoid social polarization and inequality of economy class, age, and lifestyle. These sorts of problems are prevalent today and are becoming an issue in the urban environments around the world and is present at the scale of a neighbourhood(Walks, Alan R. 187). To combat this bringing the different classes of people together will promote equality between the different strata. A design for a neighbourhood that would realize the needs of all types of social class has to be diverse and progressive to accomodate the needs of the many, but above all it must be realistic.

Objectives:

The objective of the project includes:

- Street scape must be both efficient and aesthetic
- Neighbourhood must be beneficial to surrounding developments
- Development must be Green and sustainable
- Emphasis on walkability and multimodal transportation rather than mobility
- Equality and safety among all types of people
- Community must be strong
- A large amount of investment opportunity
- Harboring a strong sense of place

Scope:

The Scope of the project includes:

- Desires
- Street scape and traffic design
- Aesthetics
- Development zones
- Park Placement
- Walkable design
- Environmental Concerns
- Positive Community Interaction
- Investment Opportunity
- Avoid Mobility focused development
- Avoid social stratification, inequality and polarization
- Avoid Lack of Community

Overall Design:

To achieve the desired streetscape a fusion of ideas from a radial type street layout and a fused grid type system is made. This streetscape design is not only able to function, but it is also able to create exactly the kind of environment desired. At the centre of the neighbourhood there is one traffic loop that acts as a large roundabout, which splits into four directions diffusing the people outward from the centre onto one-way arterial roads, These roads run the width and length of the whole development zone. Dispersing traffic out from the middle and directly to the surrounding traffic rings. This middle portion is the main hub within the neighbourhood network. Not only does it function as a dispersion point for traffic; it is also meant to create a sense of place by creating a neighbourhood square as a place of social interaction and gathering within the neighbourhood(Linch; Ley, 327). Though In the case of this development it is clearly a neighbourhood “circle”, the concept is still the same. This Centre is defined by the ring road that runs around a large park, which is then surrounded by commercial development similar to that of a b5 type; this is not a historic commercial site. But the feel and look of this commercial site should be

comparable to that of the B5 development along Broadway. Having characteristics modeled in a new urban walkable fashion with no separation of the store front from the sidewalk (Townshend; Walker, 145-146). This combination of walkable storefront design and a nice central neighbourhood park should make for a lively, socially interactive area for people to go and spend time and enjoy the community making it the busiest portion of the neighbourhood. The commercial development will be supported by the large amounts of higher density residential development of the second and third traffic rings. The high-density development supports the commercial development with employment and business and is very close and easily accessible to those living nearest to the neighbourhood centre. As the design diffuses out past the third traffic ring, it changes to reflect more of a curvi-linear type design which is there to enhance privacy and mimic a suburban type development (Buntington, Filion. 26). The roads are instead lined with many single family house lots of varying sizes, this is designed to appeal to people with potentially more money, starting a family and those that want to have privacy. These areas are so far diffused from the centre, that they should remain quiet, comfortable and safe ensuring privacy for the owner. However, these developments are still very walkable. This is allowed by the radial design of the street layout. Essentially allowing for the shortest straightest walk possible to the centre at any given point (Hall; Porterfield; 85).

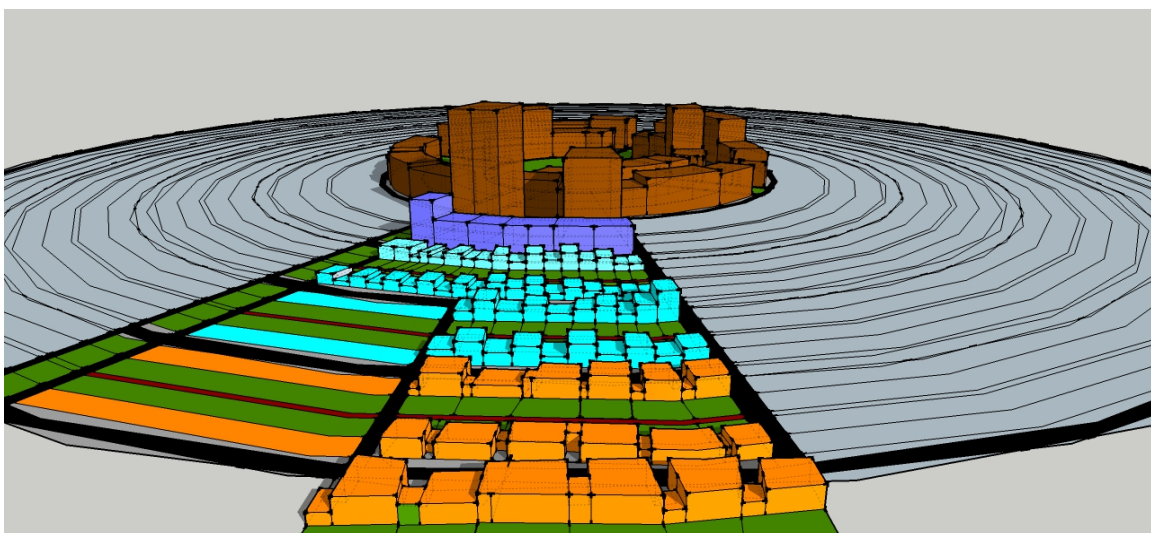


Figure 1: Development Overview

Commercial:

The type of commercial development targeted for the neighbourhood centre would include things like dentist office, cafes, restaurants, pubs and varying local businesses. The Buildings should be from 4 to 10 stories in height and parking will be along the rear of the buildings. The rear parking is in place so that the buildings can be located near the sidewalk and simply accessed by a pedestrian. This commercial development will ensure jobs for people living in the neighbourhood as well as supplying local walkable amenities to the community and amenities to the passer by driver looking for a quaint and beautiful place to enjoy their time. The commercial centre development should ensure investment into the community from the start and into the future. The Businesses in this area should be local, to support the local economy.

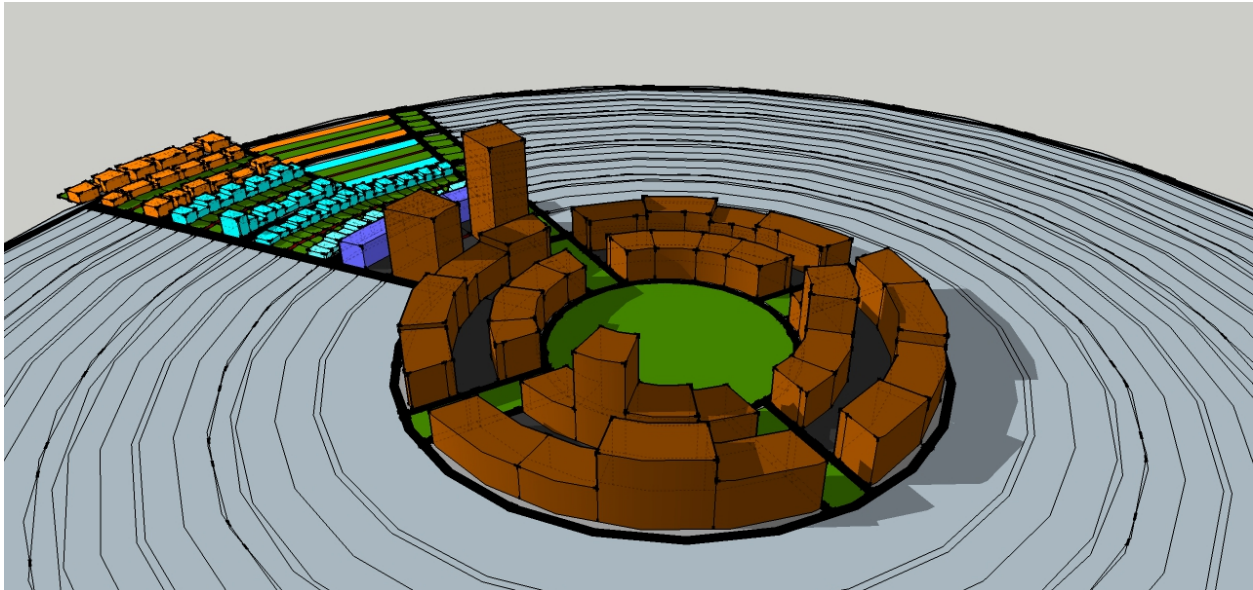


Figure 2: Commercial Development

T4 residential:

The residential development starts at the second traffic ring. This development will be largely t4, being high in density. this area should be filled with apartments closer to the centre. These buildings will be 5 to 9 stories in height.

This area will also contain single housing units. These units will be compact and comparative to the norm of new urban housing design. The lots will have back alleyways, houses will be narrow and tall, with a garage located at the back of the lot.

This is to promote new urban and accessibility oriented designs rather than designs focused solely on mobility.

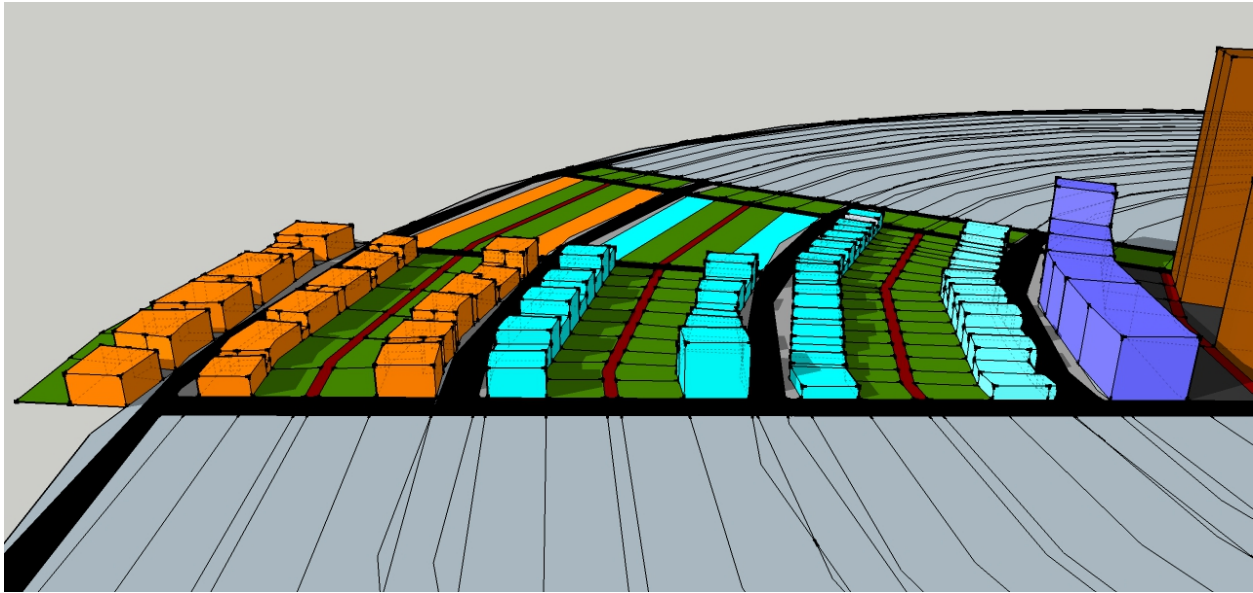


Figure 3: T4 Residential Development

T2/T3 Residential:

Single Family housing units will be prominent outside of the third traffic ring. Being more highly dense closer towards the centre. The houses there will resemble the houses located within the T4 development area. Maintaining the same sort of ideals for accessibility as the actual T4 area. But as the development stretches outward. The design becomes more and more closely alike to curvi-linear road designs. This allows for a more private feel for the single family home, and for large types of single-family home development types to take place. This Area will be a haven for those seeking the same sort of privacy they might associate with a suburb type development with the added benefit of being close to a neighbourhood centre within a still very walkable distance.

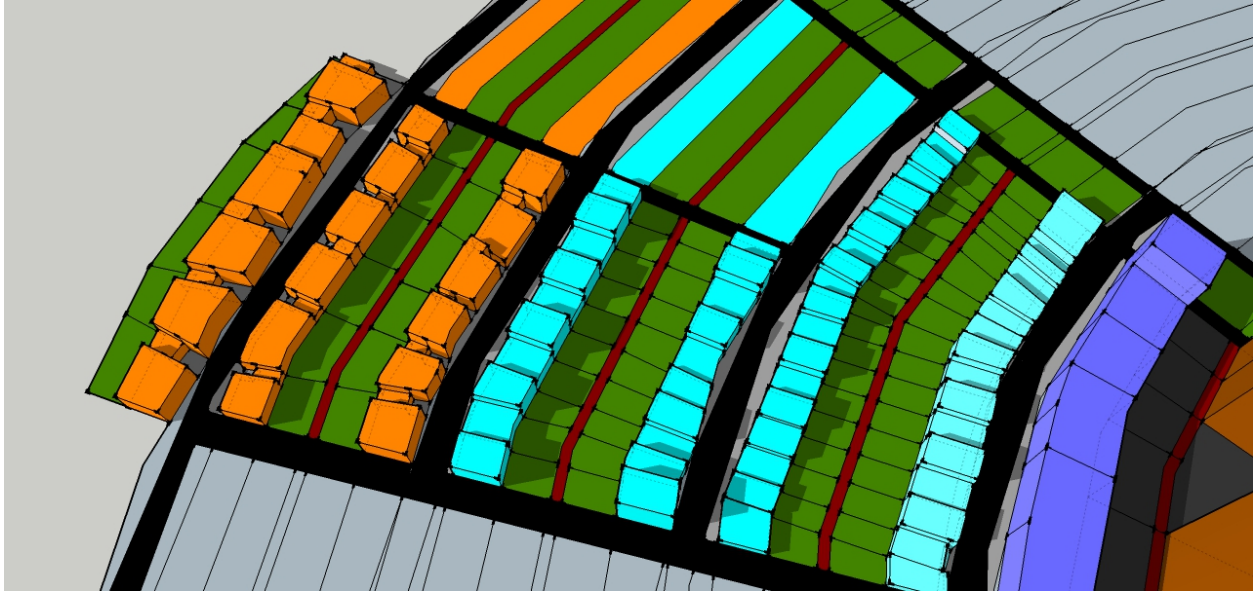


Figure 4: T3 Residential Development

Green Space:

The Central Park would be a key feature of the neighbourhood. It is a place for the whole community to come to and enjoy. The park is designed to be similar to layout as a linear type park might be, with less emphasis on large open spaces that can be seen in parks located within other suburban type areas. But rather this park will be a safe haven for nature within the neighbourhood. The park will include paths to walk on, ample amounts of fauna, a play ground and smaller open spaces amongst portions of cover. This Park will be closely related to those found in areas like nutana, city park, and along the river in the downtown portions of Toronto.

Radial Design:

A radial grid type design is chosen for the best of both the curvi-linear and grid systems. The radial design theoretically should be very efficient in dealing with traffic, while also having the same kind of accessibility typically associated with a grid system. This is achieved by making the arterial roads to be one way and separated by linear type park space or dense development. These roads will contain a driving lane, a bike lane and a parking lane. These roads would then feed onto the collector arterials which would be the radial ring roads that lead away from the main arterials. These should also be one way

either direction but will not be separated by any sort of development. Roads attached to the collector arterials will be small roads that are there to connect the different traffic rings together and to make for a suburban type feel as the roads disperse outwards from the centre. The Radial Design of the neighbourhood allows for the highest degree of connectivity, as road ways typically lead straight to the Neighbourhood Hub with little degree of variance. Having a central point that emanates out to the rest of the neighbourhood means that the centre acts as a focal point, by doing this it creates a sense of place as a central point in the neighbourhood (Porterfield, hall. 85) . This helps to create a neighbourhood square bolstering the unity, culture, and community within the neighbourhood.

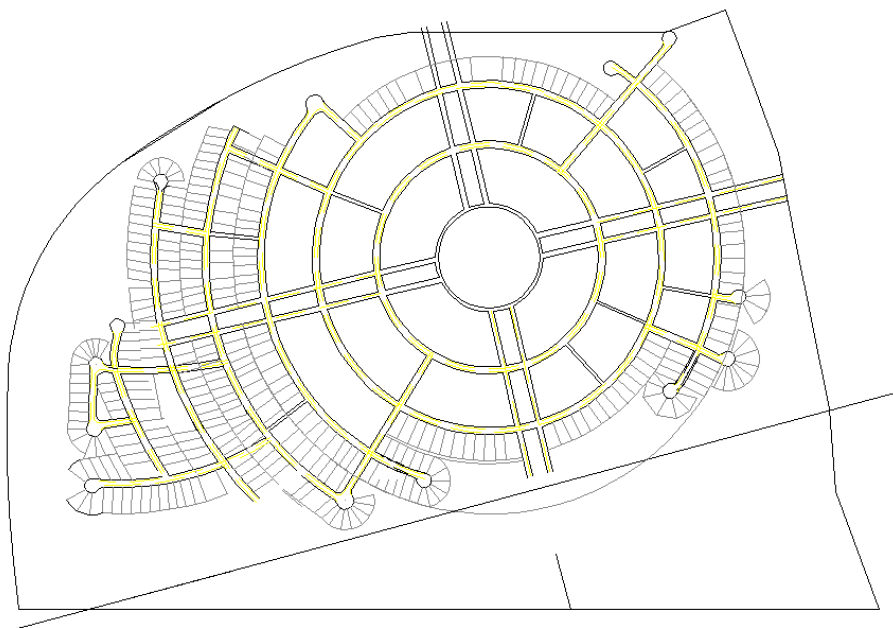


Figure 5: Radial Design Layout

Architectural Scheme:

T4:

- Houses should be setback at a distance of 8 feet from the sidewalk.
- should include a front porch
- should be modern/contemporary in design
- houses should be developed no closer than 3 feet to either side of the lot
- rear garage
- back alley ways

T2/T3:

- Setback is set at 15 feet
- may have a drive way (dependent upon lot location)
- must also maintain a modern/contemporary approach to design

WALKABILITY

As urban people getting heavier and heavier pressure from studying and working today, urban lifestyle is always looking for more environmental friendly and healthy activities in the people's daily life. Walking is one of the most efficient and predominant activities to fulfill the need of healthier urban lifestyle and beautiful living environment. Andrews, Edward, Evans and Rachel (2012) pointed out that: "In the abundance of recent studies on walkability, walking has emerged as the lifestyle behavior most readily encouraged and of perceived greatest benefit to population health". A good habit of walking activities everyday provides necessary physical exercise of fundamental healthy need for busy urban people. On the other hand, walkability is also playing more and more important role for connecting urban people with local and communities and public spaces. Hutabarat (2009) summarized that 'walkability' is such an important part of the neoliberal welfare state project to both encourage individual responsibility for wellbeing through adoption of healthy lifestyles and to lead to civic participation through presence in public spaces. Moreover, 'walkability' now is defined as one of the predominant elements for urban planning nowadays. "The criteria and measurement of 'walkability' has been increasingly refined", Van Dyck indicated (2010): there is a general consensus on the key features of walkability that make more walkable environments and also provide primarily good street connectivity, mixed land-use, high residential density and pedestrian-friendly design. Our design will always consider the walkability degree of the design field; and, make contributions to building more green space of developments towards a greener better city. All the pathways built for the pedestrian in our design are never be isolated as a road building work but always coordinate with some beautiful green spaces. Shinsuke Kato & I Kyosuke Hiyama (2012) claimed adding portion green spaces around pathways for

pedestrian, dramatically increases the safety factors and provides healthier living environment for the urban people. Furthermore, green space is considered as a buffer between stressful life and health, van den Berg (2010) said that “the availability of green space around walking community in the living environment may be an important environmental factor that moderates the relationship between stressful life events and health.” A well organized and high portion of green spaces combined with safe footpaths create better result for pedestrians and local residents”.

Pedestrian Consideration

The basic unit of walkability is pedestrian of the designed area. Pedestrian is considered one of most elemental and important factor in nowadays-urban planning projects. Pedestrian’s walking activity is a basic form of transport and in this respect is no different from the private car or public transport; it has primary effect making contributions to building eco-friendly and harmonious atmosphere on urban areas. As our design field is a connection place between York University Campus area and commercial area making this area to be a very busy pedestrian walking area of a large number of pedestrians with a large portion of students and teenagers which is required our design to have better considerations of pedestrian’s environment. NZ Transport Agency (2007) concluded, “For some groups, it is the primary means of moving around their community independently. The right to walk for pedestrian is a fundamental element in a considerable number of public policies. Although its contribution to transport objectives is often underestimated, its importance must not be ignored.” According to the “Pedestrian planning and design guide” of New Zealand Government (2008), an area with good pedestrian environment should consider and cover the following key aspects which are: community walkability, Pedestrian network components, pedestrian’s safety, and convenient footpaths. Our project design is targeting to be one of the most pedestrian friendly areas around York University Campus area by providing abundant and beautiful footpaths street furniture for the whole area; sending local officers to strictly control the speed of vehicle to decrease the accident rate as low as possible; adding more local community culture constructions; and, building some easy-reading signs for guiding people found the correct ways.

Safety Factors

Safety factors are always first concerned for planning designs. Ukkusuria (2012) pointed out that “given the benefits of walking; pedestrian and local residents’ safety has received a great deal of attention by local transportation agencies recently. For the past several years, transportation agencies have devoted many resources to improving pedestrian safety to target hazardous pedestrian locations continuing their pedestrian safety efforts. (pp.1143-1144). The safety factors of pedestrian and local residents are very comprehensive concepts that including lots of professional engineering knowledge of roads building and structuring; however, this project will be mainly focusing on the planning issues about safety problems based on the information drawn from Crime Prevention Through Environmental Design (CPTED). There is four key elements have been concluded of CPTED, which are: clear and controlled access, opportunity for surveillance, Territoriality and Lighting (City of Toronto, 2010). On the other hand, another important safety issue is about the good major infrastructural factors of the design area including access to mass transit, presence and quality of footpaths, buffers to moving traffic (planter strips, on-street parking or bike lanes) and pedestrian crossings, aesthetics, nearby local destinations, air quality, shade or sun in appropriate seasons, street furniture, traffic volume and speed (Perrotta & Daniel, 2009). Our site location is just beside main Campus area of the York University; the surrounding Campus area is a special area for people because that this area is a relative high-density population area with large amount of walking people. Most of students and teachers are walking within the campus area going for studying and working. Therefore, a better safety consideration inside the area is very important for people’s safe (especially young students) and better campus activities. Research from University of Tensesness (2011) showed that the surrounding campus area wants to see fewer cars, more pedestrians and lots of green space on campus over the next five decades in the future. A more pedestrian friendly area is needed for the communities all around world. A reliable safe walking area is the most important platform for the pedestrian and local residents. In order to fulfill the need of those safety requirements from CPTED; our group develops three main points to make contributions to the safety degrees of the target area which are making high quality of footpaths; increasing efficiency of

footpaths by building logic traffic nets and offering good lighting conditions with reliable monthly maintains.

High quality of footpaths: all the footpaths materials our groups are chosen for this design are pedestrian friendly materials. It will offer high quality of walking conditions, with relatively high resistance to survive in the bad weather condition and bad temperature condition. Especially in the wintertime, considered city of Toronto has a long term of low temperature and snow environment, the footpath will provide safety reliabilities for the residents and pedestrians.

Logic traffic nets: The key traffic design in neighborhood includes the one-way-streets that crass cross the neighborhood, the radial design around the central park, and designed bike cycling line. All these signs are leading to results of the design location having logic traffic nets; residents and pedestrians have abundant traffic sources to choose in this area and efficient traffic networks to take to the destinations.

Good lighting conditions: A good lighting condition with reliable monthly maintains: Toronto has a totally different temperature and environmental facts among each season and has a fairly long winter time with relatively very low temperature which required the road should have good lighting source to provide good road conditions for the local residents. The lack of good lighting source in this area will cause accidental slips and traffic accidents to hurts people especially in winter time; moreover, bad lighting condition will provide opportunity for the crime to hide their body into the darkness. Our design will choose NXT™ luminaire series from LED roadway lighting to implement on all the main road and pathways for the local residents. The NXT™ luminaire series is the latest innovation from LED Roadway Lighting Ltd (LRL). The modular design of NXT™ allows users to easily and quickly upgrade or replace light engines or power supplies, without tools, in less than one minute. NXT™ also gives clients increased flexibility and freedom in changing optical distribution patterns and/or upgrading to more advanced LED technology in the future. Furthermore, a monthly maintains will be added in the design area in order to make sure the lighting condition are always good enough to fulfill people's need of safety considerations.

Traffic design

Streetscape is important part of the neighborhood identity; the narrow cobble stone streets in Europe, the six-line streets cement road in China, the eight line freeway in the United States and -more closer to home the- design in Dunus Street. The streetscape provides a character to the neighborhood; a well-organized neighborhood provides opportunity for all its residents. The goal in the traffic design – on university land endowment development – is creating a desirable and sought after development – a place that people want to live – at the same time showcase the innovation from the university and modernization in the city.

The key elements of the our design include a discernable center, dedicated green space, variety of dwelling types, shops and offices, elementary school, playground, well defined pattern in the development. The key traffic design in neighborhood includes the one-way-streets that crisscross the neighborhood, the radial design around the central park, and designed bike cycling line.

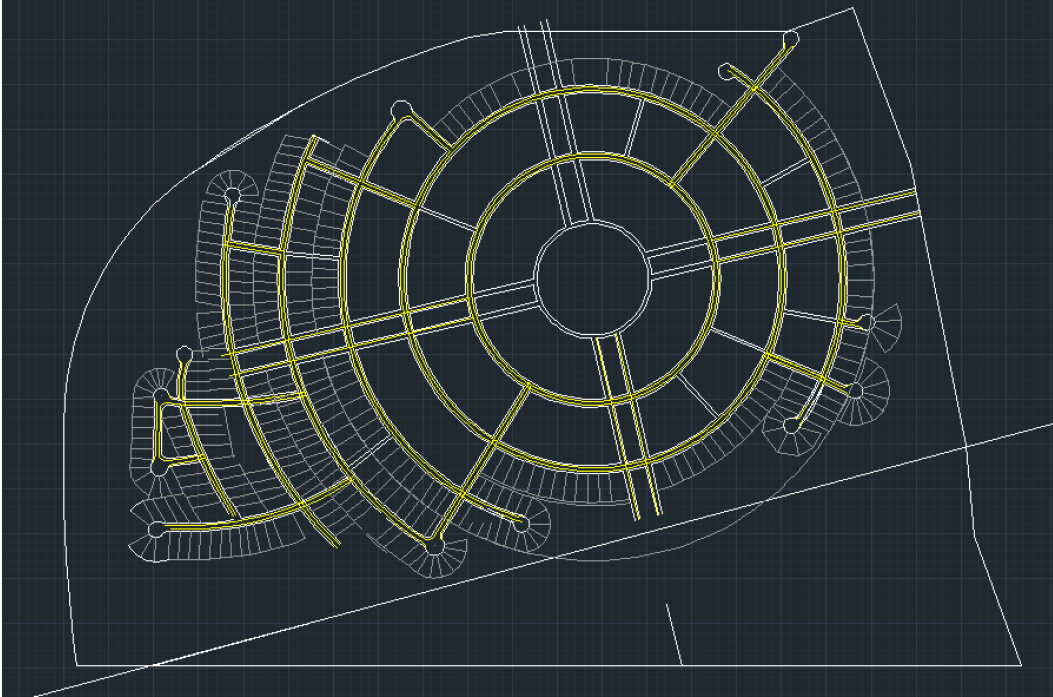


Figure 6: Development Map

An important component of traffic design is functionality. The key design of the development is to provide a place that is efficient and cost effective infrastructure. Four one-way – collector – streets are included in the design. The advantages of one-way street over two way street falls in three categories: safety, capacity and convenience. (John Stemley, 1998) In an intersection, two-way streets have 20 vehicle and pedestrian conflict points and one-way street have four conflict points. The number of conflicts at one streets result in substantial reduction in vehicle and pedestrian accidents. In report published in New York, the pedestrian accident is 25% reduction in accidents after conversion from two-way to one-way street. (John Stemley, 1998)

Apart from the safety from the one-way street, it also creates provides unique development opportunities. The one street provides the street space for a row of condos between the one-way street setup green spaces and increases the usability of the land and aesthetics of the land. This allows less space to be devoted to pavement and at the same decreases the construction and maintenance of the area.

Another key design in the neighborhood is the radial design. The radial design around the center park allows easy access to the central park from the neighborhood. The central park of the neighborhood is going to create economic opportunity in the development and additional job opportunity in the development. It includes commercial district that includes high-density residential area, a center park, recreational centers and business. It will function as development meaning place. It will provide services from shopping, banking to automotive servicing, to healthcare. These features provide a key component for the fledging development center.

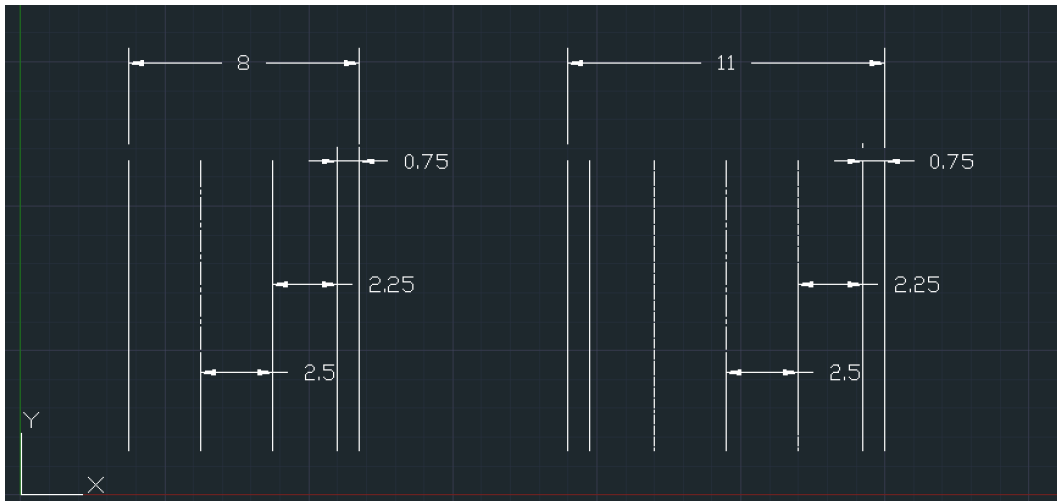


Figure 7: Road Map

The development has two types of street collector and local streets; both features designed bike line to promote alternative transportation. The collector streets will be divided two 8 meters wide street with two 2.5-meter vehicle lanes, 2.25-meter wide parking line and .75meter wide bike lane. The local street is 11-meter wide. It features 2-vehicle lines 2.5-meter wide, 2.25-meter vehicle line, two 2.25-meter wide parking lines and two .75-meter bike lanes. The bike lane is separated from the main traffic with role of parking vehicles. This provides protection for cyclists in the new development.

Majority of residents cite safety concerns as their top cause against cycling. Accident rate for cyclist are 26 to 48 times higher than for automobiles. (Share the Road, 2013) Each year approximately around 7,500 cyclists are seriously injured and 55 cyclists are killed (Bike Safety, 2012). Majority of these cases are occurred on roads without dedicated cycling lanes. One of the major causes of accident is unsafe overtaking of cyclist. The cycling lanes significantly decrease the accidents. (Share the Road, 2013) The bike line will promote biking and significantly increasing the safety of bikers at the same reduces vehicles traffic.

Important component of traffic design is connectivity and efficiency. In the university land endowment development, a significant amount of planning is put in place. This include increasing walkability, transit connectivity and alternative transportation. These features increase connectivity around the development and at the same time create sense of the neighborhood.

Road Material:

In the development, PICP is used for roadways, sidewalk, and parking lots. PICP offers many advantages while at the same time lowering the cost (please see table #: Roadway Cost Comparison). PICP is composed of pre-manufactured concrete units. It is similar to paving blocks used on patio and landscaping. The concrete units have small gaps between themselves that creates a permeable joint. This unique texture gives PCIP many benefits over conventional pavement from environmental benefits, aesthetics to lower life cycle cost to increased traction in the winter. This include 1) reducing the need for storm sewers and drainage, 2) increases increase curb appeal, 3) provide high permeable surfaces, 4) help to meet storm water drainage design, 5) increases building opportunity, 6) promote tree growth, 7) reduce heat island effect in city, 8) cost effective, 9) reduces costly infrastructures and 10) low life cycle cost.

Table 1: Roadway Cost comparison

Item (2006 prices)	PICP	Concrete	Asphalt
Paving (m ²)	24.21	86.08	32.28
Excavating (m ²)	10.76	10.76	10.76
Stone (m ²)	21.52	16.14	16.14
Installation (m ²)	43.04	43.04	16.14
Curbs (m ²)	16.14	16.14	16.14
Maintenance (m ²)	2.15	0	Not known
Replacement (m ²)	None	None	Every 12 years
Detention/Retention required	None	Yes	Yes
Storm Sewer System (m ²) per paving	None	32.28	32.28
Total (m ²)	117.82	161.4	123.74

Apart from reducing storm water run off and pollution, PCIP has additional benefits in freeze and thaw conditions. PCIP – conform to ASTM C 936 standard in US and CSA A231.2 standard in Canada – and performs well in the cold conditions (ASTM C 936). PCIP's have been implemented in Canada, Northern U.S., Germany and the United Kingdom. They have been shown to be durable in cold condition, this includes ability to accept road

salts and snow plows. In addition when the temperature is higher, PCIPs can soak up melting ice and snow. This process prevents ice build up on road surfaces. In the thawing and freezing conditions, PCIP performs better than standard road types. PCIP has adequate spacing to allow the water to expand. Due to the size and arrangement of PICP, they are not prone to freezing damage like – concrete and asphalt roads – conventional materials.

PICP also has other benefits such as reducing vehicle speed. PICP is not idea for high-speed vehicles. Due to small gaps, this creates rattling at high speeds. This material will reduce vehicle speed in the development and increase driver awareness.

Financial Analysis

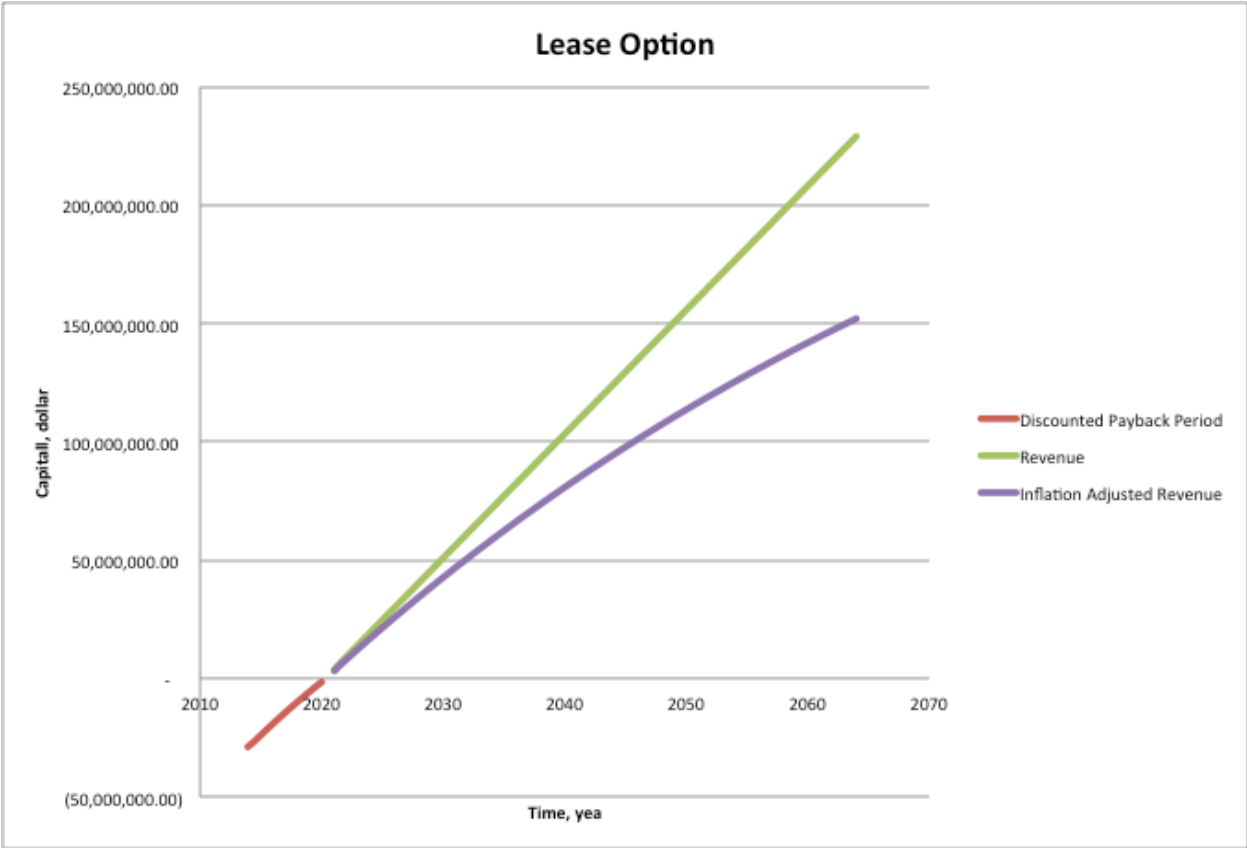
The York University land endowment could generate significant amount of revenue for the university. The development of the university plan would require a significant initial investment. The development needs approximately 12.48 kilometers of road – 124.8 (10³) square meters of road-, 50 kilometers of pipe and utility lines. This includes drinking water lines, treated water lines, sewage line, storm water lines and the utility lines. The total cost of the piping is expected to be 3.6 million dollars plus 1.5 million dollars in labor. The road way is expected to cost 10.3 million dollars. Utility company covers the utility lines. There will approximately be 120 lighting posts in the development; they will cost approximately 2.5 million dollars based on price 25,000 each. Green spaces, sidewalk and street signs will cost 5 to 10 millions dollars. The total cost of the project is expected to 22.9 million dollars. This is based on the material cost from Riverdale City Department of Public Works. There are many options for the university to recover the cost.

Lease Option

One of the options the York University could use is land endowment program used by the University of British Columbia. The British Columbia government set aside approximately 1,200 hectares (3,000 acres) of land to University of British Columbia. This is aimed to raise capital for starting and operating university. The proceeds generated by the land has contributed \$343 million dollar to the university (UBC Planning, 2013). Following the development of UTown, UBC's residential community, in the 1990s, the land endowment provides approximately 12 million to the university (UBC Planning, 2013).

However, there are key difference between Toronto and Vancouver. The study area of the York University land endowment is 69.821 hector, approximately one twentieth of the UBC land endowment. The average house price in Metro Vancouver is \$670,300 dollars (Peter Meinzner, 2014). The average house price in Toronto is \$547,000 at the end of 2013 (Susan Pigg, 2014).

The main advantage of the leasing the land out is the University will not lose the ownership of the land. This will significantly benefit the university when the city grows and the land prices increases. This will also generate a steady source of revenue for the York University. And like the UBC, this will involve an agreement between the university and the resident such as a 50-year lease agreement with fixed payment month payments. The payment will depend on the size of the lot. This could be based on the average price of the lot to be \$250,000 and interest rate. It could be calculated by infinity payment with interest rate of 4%. Average month is 833 dollars per lot. And average month payment of commercial is \$40,000 and high-density development \$ 80,000.



Graph 1: Payback Period On the Lease Option

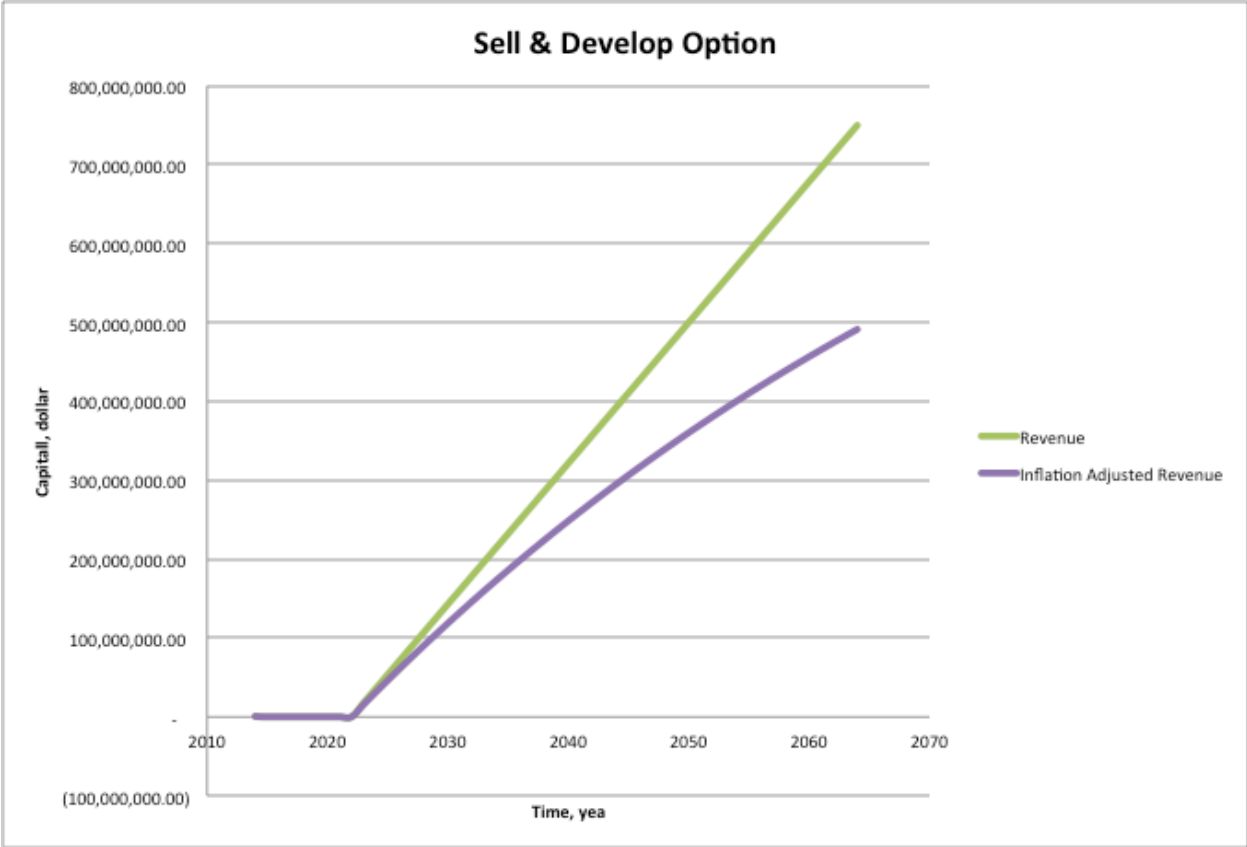
The development is expected to generate 5.2 million dollars each year. The estimated break-even point is in 7 years with development cost and 10 years using a discounted payback period (interest rate of 4%). The expected revenue from bridge is 229 million dollars in a fifty-year period. The revenue is corrected for 1.5% inflation is 152 million dollars. This revenue will significantly increase the financial stability of the university and provide more resources for research.

Sell/Develop Option:

Another alternative is to sell the part of the developments and develop part of the development. This would include selling out the 380 residential lots to help fund the development of the high-density housing and commercial area. The average price of the 380 lots is 250,000 dollar. The University will be able to accept majority of this amount if it chooses to maintain the development. It could be handled by the university's land management branch. This includes snow plowing, maintaining roadway and building infrastructures. The selling of 380 lots will generate approximately 95 million dollars. This amount could payoff the initial investment in the development. It will give the university 65 million dollars to develop the high-density development.

The 65 million dollars earned from the residential lot sells could be applied to the high-density development. It costs approximately 3.1 million dollars to develop condo with 40 unit and around 1200 square feet each with underground parking. The university will be able to develop all of these buildings. It will take 5 years to fully develop these units. When full finished the development is expected to house 880 units each unit is expected to have 3 or 4 bead rooms. Each unit will have rent of 1600 dollars a month. In addition the university could use revenue generated from the rental units to develop the commercial district. This would generate approximately 80,000 per month. Although the university will not receive any revenue in the first 8 years, this will create significant revenue for the university in the long run.

Graph 2: Revenue from Sellout/ Development Option



Graph 1: Sell & Develop Option

This option will generate approximately 17.9 million dollars per year. The expected revenue from the project is 750 million dollar in revenue over fifty years. The revenue corrected with 1.5% inflation is expected to generate 491 million dollar inflation adjusted. This is keeping the rent at the same rate. Apart from the financial benefits, selling parts of the development to homeowners. Homeowners are more likely to invest their properties.

Although this includes giving up control of the land, this will provide the university a stable source of revenue. Helping the university to provide education standards while at the same time reduce its reliance on outside funding. The project will also demonstrate the innovation and the modernism of the university. It will help the community have a better view of the university. Which will create a better environment around the campus and additional economic benefits including university food services, campus store and lease opportunities. This option will create significantly more revenue for the university than leasing the land.

The function of this neighborhood is to create a close knit community among all classes of people and to do that with the utmost efficiency and economic benefit. People should look to a brighter future by supporting this design and all that it stands for; equality, sustainability and an overall healthier world to live in. By Realizing the goals and needs of today and for the future. This plan matches the required functions well, Being progressive in its nature by realizing the problems of today and the future. By finding solutions for those problems and exercising their ability to work. This neighborhood is meant to potentially pave a way for future development in Toronto. As pressure shifts towards more sustainable and progressive ways of living in the future to maintain the same quality of life that is enjoyed now become more prevalent.

Conclusion

Toronto is a developing city and is currently experiencing a growth in population. The City of Toronto expects the population to reach 500,000 in a period of 20 years. Even though this growth is great for the city, it comes with challenges. The greatest challenge of them all is to living space.

In order to achieve additional revenue for the university and sustainable living in the Toronto, alternatives are created. The creation of the university land endowment project is suggested. This idea offers the university with additional revenue. At the same time the chance for the city of Toronto to see a decrease in housing price and rent because increase in supply of housing. This also reduces some of the living expanses for students. The elimination of the high expenses will make help the university to be competitive with other university. This will in return create more revenue of the university. This project will also server as a testimony of innovation in the university.

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Appendix

Appendix A: Material Costs

Table 1: Piping Material Cost

Item	Unit Cost	Number of Units	Total Cost
Mobilization	45,000.00	1	45,000.00
24" rcp drain pipe	71.50	20000	1,430,000.00
30" rcp drain pipe	89.75	4000	359,000.00
15" rcp water pipe	55.25	20000	1,105,000.00
24" rcp water pipe	85.50	4000	342,000.00
Grate inlet catch basin box	2,725.00	100	272,500.00
Furnish trench backfill materials (ton)	4.50	300	1,350.00
Furnish bedding materials (ton)	10.50	500	5,250.00
Total			3,560,100.00

Appendix B: Projected Revenue

Table B1: Financial Analysis on the Lease Option

Number of Years	Year	Conventional Payback Period	Discounted Payback Period	Revenue	Inflation Adjusted Revenue
0	2014	(29,000,000)	(29,000,000)	-	-
1	2015	(23,760,000)	(23,961,538)	-	-
2	2016	(18,520,000)	(19,116,864)	-	-
3	2017	(13,280,000)	(14,458,523)	-	-
4	2018	(8,040,000)	(9,979,349)	-	-
5	2019	(2,800,000)	(5,672,451)	-	-
6	2020	-	(1,531,203)	-	-
7	2021	-	-	3,708,797	3,190,178
8	2022	-	-	8,948,797	7,841,784
9	2023	-	-	14,188,797	12,424,647
10	2024	-	-	19,428,797	16,939,783
11	2025	-	-	24,668,797	21,388,194
12	2026	-	-	29,908,797	25,770,864
13	2027	-	-	35,148,797	30,088,765
14	2028	-	-	40,388,797	34,342,855
15	2029	-	-	45,628,797	38,534,077
16	2030	-	-	50,868,797	42,663,360
17	2031	-	-	56,108,797	46,731,619
18	2032	-	-	61,348,797	50,739,755
19	2033	-	-	66,588,797	54,688,659
20	2034	-	-	71,828,797	58,579,204
21	2035	-	-	77,068,797	62,412,253
22	2036	-	-	82,308,797	66,188,656
23	2037	-	-	87,548,797	69,909,250
24	2038	-	-	92,788,797	73,574,861
25	2039	-	-	98,028,797	77,186,299
26	2040	-	-	103,268,797	80,744,367
27	2041	-	-	108,508,797	84,249,852
28	2042	-	-	113,748,797	87,703,532
29	2043	-	-	118,988,797	91,106,172
30	2044	-	-	124,228,797	94,458,528
31	2045	-	-	129,468,797	97,761,340
32	2046	-	-	134,708,797	101,015,343
33	2047	-	-	139,948,797	104,221,258
34	2048	-	-	145,188,797	107,379,794
35	2049	-	-	150,428,797	110,491,652
36	2050	-	-	155,668,797	113,557,522

37	2051	-	-	160,908,797	116,578,084
38	2052	-	-	166,148,797	119,554,007
39	2053	-	-	171,388,797	122,485,951
40	2054	-	-	176,628,797	125,374,565
41	2055	-	-	181,868,797	128,220,491
42	2056	-	-	187,108,797	131,024,359
43	2057	-	-	192,348,797	133,786,790
44	2058	-	-	197,588,797	136,508,397
45	2059	-	-	202,828,797	139,189,783
46	2060	-	-	208,068,797	141,831,543
47	2061	-	-	213,308,797	144,434,262
48	2062	-	-	218,548,797	146,998,517
49	2063	-	-	223,788,797	149,524,877
50	2064	-	-	229,028,797	152,013,902
51	2065	-	-	234,268,797	154,466,143
52	2066	-	-	239,508,797	156,882,144
53	2067	-	-	244,748,797	159,262,440
54	2068	-	-	249,988,797	161,607,560
55	2069	-	-	255,228,797	163,918,022
56	2070	-	-	260,468,797	166,194,340
57	2071	-	-	265,708,797	168,437,018
58	2072	-	-	270,948,797	170,646,553
59	2073	-	-	276,188,797	172,823,434
60	2074	-	-	281,428,797	174,968,145
61	2075	-	-	286,668,797	177,081,161
62	2076	-	-	291,908,797	179,162,950
63	2077	-	-	297,148,797	181,213,973
64	2078	-	-	302,388,797	183,234,686
65	2079	-	-	307,628,797	185,225,536
66	2080	-	-	312,868,797	187,186,965
67	2081	-	-	318,108,797	189,119,407
68	2082	-	-	323,348,797	191,023,290
69	2083	-	-	328,588,797	192,899,038
70	2084	-	-	333,828,797	194,747,065
71	2085	-	-	339,068,797	196,567,781
72	2086	-	-	344,308,797	198,361,590
73	2087	-	-	349,548,797	200,128,890
74	2088	-	-	354,788,797	201,870,072
75	2089	-	-	360,028,797	203,585,522
76	2090	-	-	365,268,797	205,275,621
77	2091	-	-	370,508,797	206,940,743

78	2092	-	-	375,748,797	208,581,257
79	2093	-	-	380,988,797	210,197,527
80	2094	-	-	386,228,797	211,789,911
81	2095	-	-	391,468,797	213,358,763
82	2096	-	-	396,708,797	214,904,430
83	2097	-	-	401,948,797	216,427,254
84	2098	-	-	407,188,797	217,927,573
85	2099	-	-	412,428,797	219,405,721
86	2100	-	-	417,668,797	220,862,023
87	2101	-	-	422,908,797	222,296,804
88	2102	-	-	428,148,797	223,710,382
89	2103	-	-	433,388,797	225,103,069
90	2104	-	-	438,628,797	226,475,174
91	2105	-	-	443,868,797	227,827,002
92	2106	-	-	449,108,797	229,158,852
93	2107	-	-	454,348,797	230,471,020
94	2108	-	-	459,588,797	231,763,796
95	2109	-	-	464,828,797	233,037,467
96	2110	-	-	470,068,797	234,292,316
97	2111	-	-	475,308,797	235,528,619
98	2112	-	-	480,548,797	236,746,653
99	2113	-	-	485,788,797	237,946,685
100	2114	-	-	491,028,797	239,128,984

Table B2: Financial Analysis of Sell & Develop Option

Number of Years	Year	Revenue	Inflation Adjusted Revenue
0	2014	-	-
1	2015	-	-
2	2016	-	-
3	2017	-	-
4	2018	-	-
5	2019	-	-
6	2020	-	-
7	2021	-	-
8	2022	-	-
9	2023	17,856,000	15,616,719
10	2024	35,712,000	31,002,649
11	2025	53,568,000	46,161,201
12	2026	71,424,000	61,095,735
13	2027	89,280,000	75,809,561
14	2028	107,136,000	90,305,942
15	2029	124,992,000	104,588,090
16	2030	142,848,000	118,659,173
17	2031	160,704,000	132,522,308
18	2032	178,560,000	146,180,569
19	2033	196,416,000	159,636,984
20	2034	214,272,000	172,894,536
21	2035	232,128,000	185,956,163
22	2036	249,984,000	198,824,762
23	2037	267,840,000	211,503,184
24	2038	285,696,000	223,994,240
25	2039	303,552,000	236,300,699
26	2040	321,408,000	248,425,290
27	2041	339,264,000	260,370,699
28	2042	357,120,000	272,139,575
29	2043	374,976,000	283,734,527
30	2044	392,832,000	295,158,125
31	2045	410,688,000	306,412,902
32	2046	428,544,000	317,501,351
33	2047	446,400,000	328,425,932
34	2048	464,256,000	339,189,066
35	2049	482,112,000	349,793,139
36	2050	499,968,000	360,240,501

37	2051	517,824,000	370,533,469
38	2052	535,680,000	380,674,324
39	2053	553,536,000	390,665,314
40	2054	571,392,000	400,508,654
41	2055	589,248,000	410,206,526
42	2056	607,104,000	419,761,079
43	2057	624,960,000	429,174,433
44	2058	642,816,000	438,448,672
45	2059	660,672,000	447,585,854
46	2060	678,528,000	456,588,004
47	2061	696,384,000	465,457,117
48	2062	714,240,000	474,195,160
49	2063	732,096,000	482,804,068
50	2064	749,952,000	491,285,752
51	2065	767,808,000	499,642,090
52	2066	785,664,000	507,874,936
53	2067	803,520,000	515,986,114
54	2068	821,376,000	523,977,423
55	2069	839,232,000	531,850,633
56	2070	857,088,000	539,607,491
57	2071	874,944,000	547,249,715
58	2072	892,800,000	554,779,000
59	2073	910,656,000	562,197,014
60	2074	928,512,000	569,505,403
61	2075	946,368,000	576,705,786
62	2076	964,224,000	583,799,759
63	2077	982,080,000	590,788,896
64	2078	999,936,000	597,674,745
65	2079	1,017,792,000	604,458,832
66	2080	1,035,648,000	611,142,662
67	2081	1,053,504,000	617,727,716
68	2082	1,071,360,000	624,215,454
69	2083	1,089,216,000	630,607,314
70	2084	1,107,072,000	636,904,713
71	2085	1,124,928,000	643,109,047
72	2086	1,142,784,000	649,221,692
73	2087	1,160,640,000	655,244,001
74	2088	1,178,496,000	661,177,312
75	2089	1,196,352,000	667,022,937
76	2090	1,214,208,000	672,782,175
77	2091	1,232,064,000	678,456,300

78	2092	1,249,920,000	684,046,571
79	2093	1,267,776,000	689,554,228
80	2094	1,285,632,000	694,980,490
81	2095	1,303,488,000	700,326,561
82	2096	1,321,344,000	705,593,627
83	2097	1,339,200,000	710,782,854
84	2098	1,357,056,000	715,895,393
85	2099	1,374,912,000	720,932,377
86	2100	1,392,768,000	725,894,923
87	2101	1,410,624,000	730,784,131
88	2102	1,428,480,000	735,601,084
89	2103	1,446,336,000	740,346,851
90	2104	1,464,192,000	745,022,484
91	2105	1,482,048,000	749,629,019
92	2106	1,499,904,000	754,167,476
93	2107	1,517,760,000	758,638,863
94	2108	1,535,616,000	763,044,170
95	2109	1,553,472,000	767,384,375
96	2110	1,571,328,000	771,660,438
97	2111	1,589,184,000	775,873,308
98	2112	1,607,040,000	780,023,919
99	2113	1,624,896,000	784,113,191
100	2114	1,642,752,000	788,142,030