SUSTAINABLE RESIDENTIAL REDEVELOPMENT:

An Evaluation of CFB Calgary East Using the City of Calgary's Sustainable Suburbs Study

A Master's Report

by

Jeffrey T. Thiessen

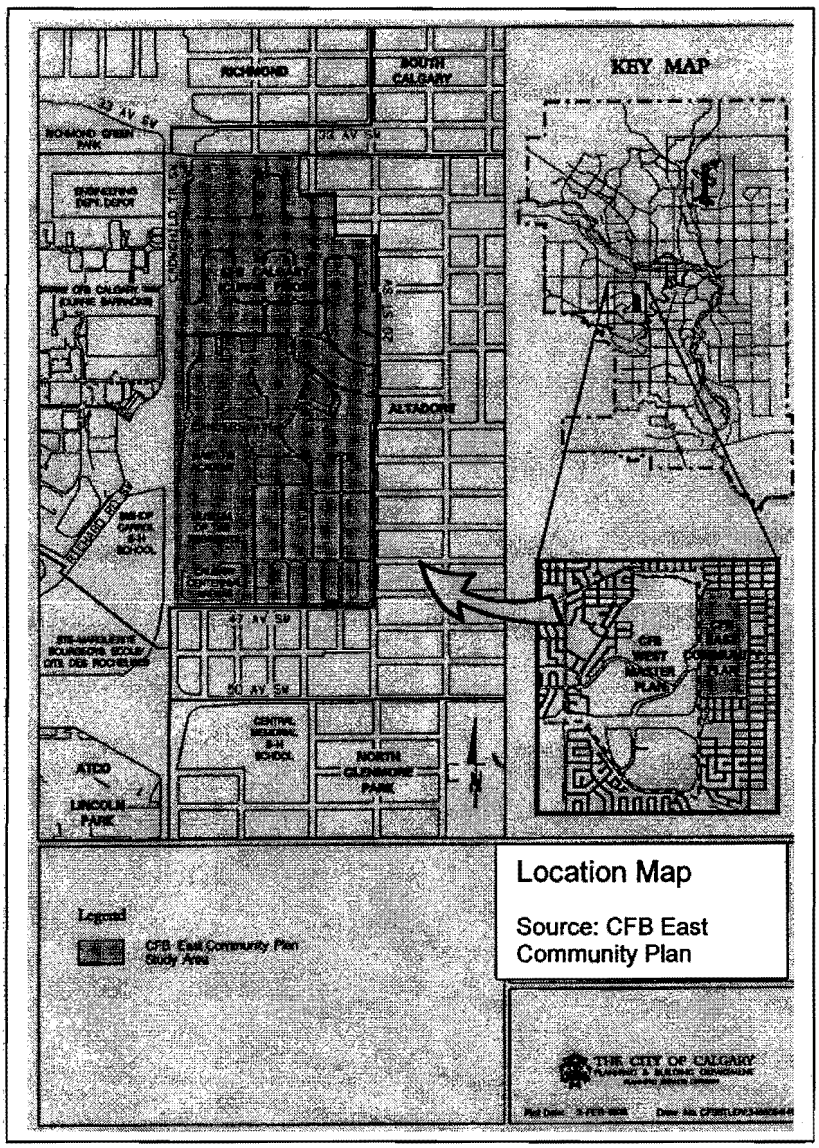
A report submitted in partial fulfilment of the requirements
for the degree of Master of Urban and Regional Planning

School of Urban and Regional Planning
Queen's University at Kingston, Ontario

Fall 2002

EXECUTIVE SUMMARY

A decision by the Federal Government to close CFB Calgary presented a unique opportunity to redevelop a large contiguous tract of land in close proximity to the downtown core. The CFB East site allowed for the redevelopment of a new residential development on a 71.3 hectare site based on principles of sustainability.



The site plans were developed using the principles of the City of Calgary's 1995 Sustainable Suburbs Study (for sake of brevity it will be referred to as the SSS). The SSS was intended for a more sustainable method of developing greenfield suburban sites, but proved transferable to a more central location. The Currie PMQ site gives the City of Calgary an excellent opportunity to implement its objective of developing a more sustainable type of residential neighborhood.

Community Centres or Neighborhood Nodes Criteria	Built Open Space Criteria	Housing Criteria	Transportation Networks Criteria	Environmental Criteria
Density around community centre / neighborhood node	Linkage of open space elements	Relationship of housing unit to street	Distance from dwelling units to transit stops	
Pedestrian friendly	Location of pedestrian and cyclist systems	Small front-yard setback	Aesthetic streetscape	
	Choice of open space activities	Location of multi-family housing	Rear lanes and/or shared driveways	
	Stormwater facilities	Multi-family units site less than 1.2 ha	Streets enhance vistas	
	Community facility at community centre			
	Commons or central park			

THE THREE OPTIONS EVALUATED

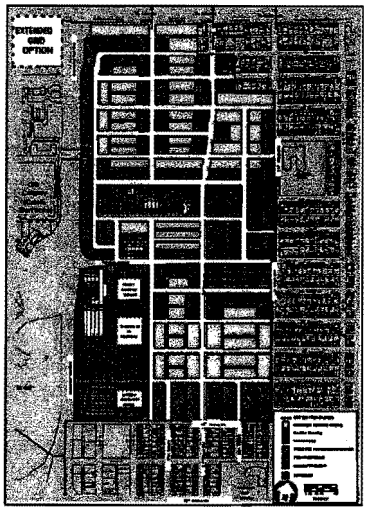
Three site plans were developed and analyzed using the set criteria, noting that not all criteria are possible to achieve simply because of the size of the site. The first two options, the Extended Grid option and the Modified Grid option, were developed by the author of this report prior the development of the City of Calgary's CFB East Community Plan. The third option, the City Plan, was the subject of an intensive and successful public consultation process.

DESIGN CRITERIA USED TO EVALUATE DEVELOPMENT PLANS AGAINST SUSTAINABLE DEVELOPMENT PRINCIPLES

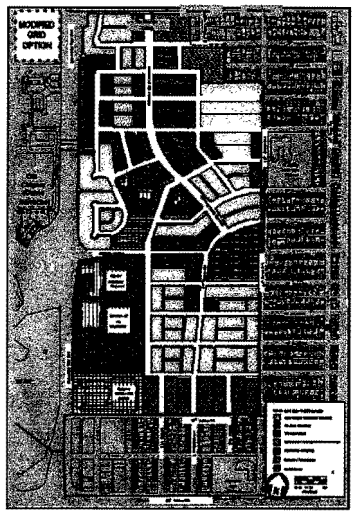
Design principles were extracted from the SSS in order to develop the baseline criteria against which the development options could be evaluated, in an attempt to determine if the SSS is applicable to an inner-city suburban site.

Five broad sustainable design categories containing 41 design criteria were used to evaluate the three development options. An overview of the sustainable design categories and design criteria is as follows:

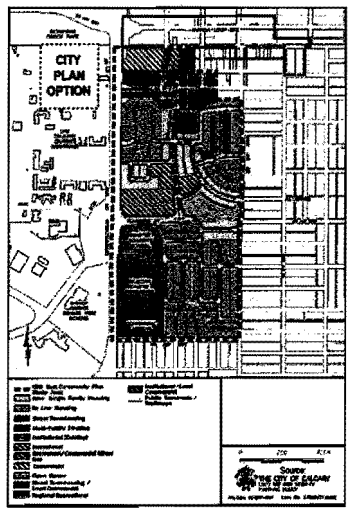
Community Centres or Neighborhood Nodes Criteria	**Built Open Space Criteria**	**Housing Criteria**	**Transportation Networks Criteria**	**Environmental Criteria**
Amount of commercial development	Regional pathway system	Gross density targets	Streets act as links	Natural drainage
Mix of uses	Distribution of / Access to public activity areas	Graduated densities	Street design moderates vehicle speed.	Stormwater management facilities
Location of neighborhood node	Relationships of parks to streets, buildings, and other public spaces.	Percentage of non-single-family-detached housing	Grid or modified grid design	Solar orientation of housing units
Direct routes to community centre / neighborhood node	Boundaries of parks	Percentage of multi-family units	Short-cutting vehicle traffic discouraged	
Housing options	Multi-use park development	Location of garages	Transit stops at community centres / neighborhood nodes	



Extend Grid



Modified Grid



City Plan

RESULTS OF ANALYSIS

Analysis of the three options revealed that many of the principles of the SSS could be incorporated in a smaller inner-city suburban site. All three options provided: residential densities greater than the adjacent neigbhorhoods, but only the City Plan surpassed the SSS minimum target density. Other principles such as a variety of residential options; pedestrian-friendly streetscapes; potentially increased public transit usage as well as alternative forms of transportation; increased social/recreational/community facilities; and, reduced environmental impacts through site design as well as re-use of existing housing stock were also achieved on the site. The development characteristics of each plan are summarized below.

Development Characteristics of the Conceptual Plans

	Extended Grid		Modified Grid		City Plan	
Land Use	Hectares	% of Total Gross Area	Hectares	% of Total Gross Area	Hectares	% of Total Gross Area
Mixed Use	0.0	0%	2.0	3%	0.6	1%
Park/Open Space	2.4	3%	3.1	4%	5.0	7%
Institutional	12.8	18%	13.4	19%	13.1	18%
Leisure	3.8	5%	3.8	5%	3.1	4%
Residential	52.3	73%	49.0	69%	49.5	70%
Total	**71.3**	**100%**	**71.3**	**100%**	**71.3**	**100%**

Comparison of Residential Characteristics

	Extended Grid		Modified Grid		City Plan	
Residential by Type of Unit	Number of Units	% of Total Units	Number of Units	% of Total Units	Number of Units	% of Total Units
Townhouse	556	50%	415	43%	314	20%
Single Detached	451	41%	454	47%	238	15%
Re-use Single Detached	98	9%	98	10%	409	25%
Multi-Tenant Apartment (1)	0	0%	0	0%	646	40%
Total Units	1105	100%	967	100%	1607	100%
Gross Density (Units per hectare)	**15.5**		**13.6**		**22.5**	

A summary of the performance of each option for the five general categories is presented below. The Modified Grid option incorporated more SSS principles than the Extended Grid option, but ultimately, The City Plan was confirmed as providing the best fit with the principles of sustainability.

Summary Analysis of the Three Development Options

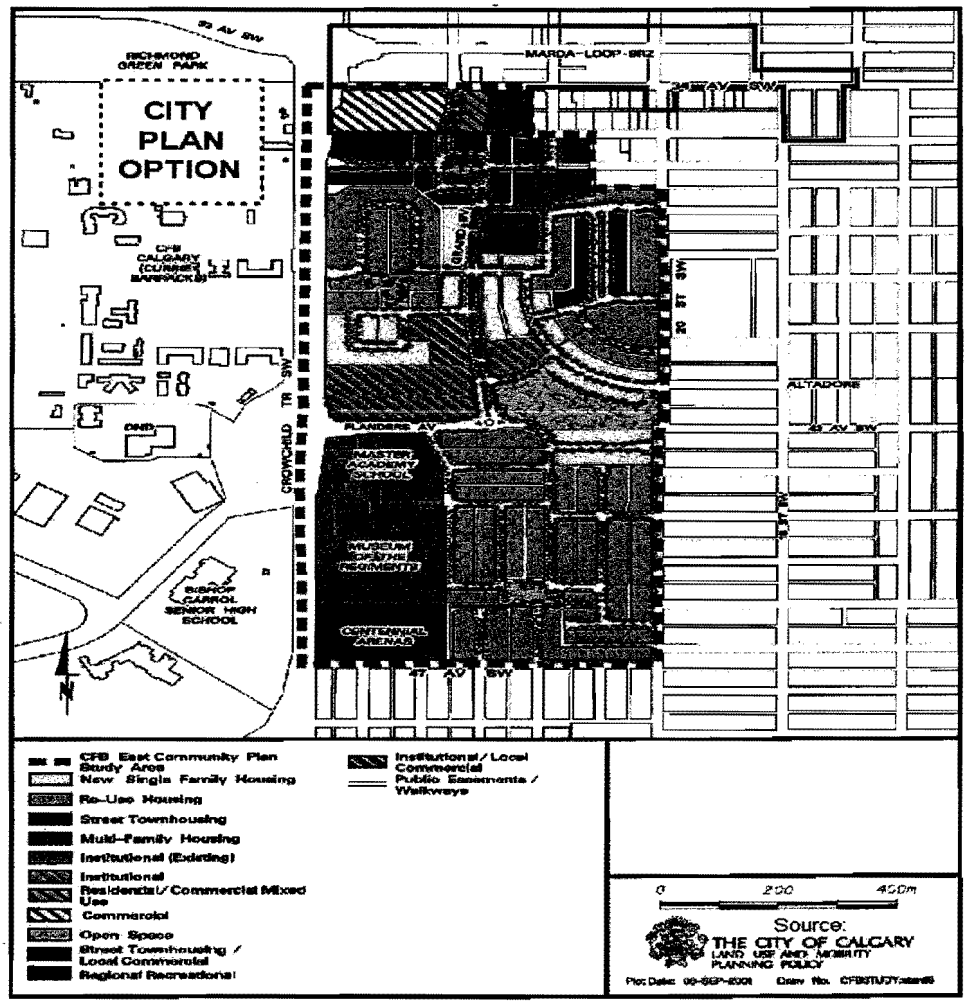
Design Component	Rating Category	Extended Grid		Modified Grid		City Plan	
		# of Criterion with Rating	% of Criterion with Rating	# of Criterion with Rating	% of Criterion with Rating	# of Criterion with Rating	% of Criterion with Rating
Community Centres or Neighbor-hood Nodes	Superior	2	29%	6	86%	6	86%
	Good	4	57%	1	14%	1	14%
	Minimal	1	14%	0	0%	0	0%
	Total	7	100%	7	100%	7	100%
Built Open Space	Superior	5	45%	8	73%	7	64%
	Good	6	55%	3	27%	4	36%
	Minimal	0	0%	0	0%	0	0%
	Total	11	100%	11	100%	11	100%
Housing	Superior	5	56%	5	56%	9	100%
	Good	2	22%	3	33%	0	0%
	Minimal	2	22%	1	11%	0	0%
	Total	9	100%	9	100%	9	100%
Trans-portation	Superior	6	67%	9	100%	7	78%
	Good	3	33%	0	0%	1	11%
	Minimal	0	0%	0	0%	1	11%
	Total	9	100%	9	100%	9	100%

Design Component	Rating Category	Extended Grid		Modified Grid		City Plan	
		# of Criterion with Rating	% of Criterion with Rating	# of Criterion with Rating	% of Criterion with Rating	# of Criterion with Rating	% of Criterion with Rating
Environment	Superior	0	0%	0	0%	0	0%
	Good	2	67%	2	67%	2	67%
	Minimal	1	33%	1	33%	1	33%
	Total	3	100%	3	100%	3	100%
Total All Design Component	Superior	18	46%	28	72%	29	74%
	Good	17	44%	9	23%	8	21%
	Minimal	4	10%	2	5%	2	5%
	Total	39	100%	39	100%	39	100%

CONCLUSIONS AND RECOMMENDATIONS

- The City Plan was deemed to be the best of the three designs. The City Plan was able to achieve both greater densities than the Extended Grid option and the Modified Grid option, while still retaining the existing community facilities. The City Plan design is detailed on the following page.
- The design principles in the SSS proved to be applicable to an inner-suburban site. While an opportunity such as a CFB closure is rare, the SSS has proved that its principles are transferable, and as such may assist any future developments, including brownfields and even greyfields.
- The degree to which sustainable development principles can be applied in a redevelopment site will be greatly influenced by the retention of existing land uses and transportation networks, as well as by the degree of acceptance of the citizens of adjacent neighborhoods.
- Public consultation appears to be a key to implementing sustainable development principles, as evident in the stronger evaluation results of the City Plan.

- The consultation process and the desire to design a more sustainable community resulted in the conception of a residential development that offers a mix of uses, has the potential to reduce the reliance of the private automobile while increasing the number of alternative transportation options within the neighborhood and potentially strengthening intra-urban public transportation options. Even though intended for a peripheral greenfields site, the principles in the Sustainable Suburbs Study can be applied successfully to an inner-suburban site.



- It appears that increasing densities and providing more types of housing can be accommodated through sensitive design. It also appears that the provision of rear lanes does not appear to significantly impact on the ability to achieve higher densities, yet provides the opportunity to promote alternative modes of transportation such as cycling and walking, and promotes aesthetic streetscapes.

- The ability to meet environmental criteria, such as solar orientation and natural drainage, proved to be the most difficult to achieve. When evaluating environmental criteria in a redevelopment site, the results must be examined in the context of the overall improvement to the adjacent neighborhoods as well. All three options had a lower achievement in the environmental category but this must be taken in the context of the overall improvement in other areas of sustainability.
- Since the inception of this report, the Canada Lands Company has begun (and almost completed at this date) implementing the CFB East Community Plan through phased development. Upon the completion of the last phase, a post-occupancy evaluation would be beneficial to understand the sustainable development successes, as well as to document where improvements might be gained