6.0 Alternative Solutions (Phase 2)

6.1 Alternative Solution Strategies

The alternative solutions to the problem identified in this study were presented to the public at PIC #2. These alternative actions were grouped into three streams:

- Road widening;
- Road closures and traffic calming measures; and
- Additional signals and tum lanes at existing local roads.

Although road closures, traffic calming measures and provisions for additional signals were considered during this study, the overwhelming focus was the development of design concepts for roadway improvements along the Cabana-Division Road Corridor.

6.2 Identification of the Alternative Solutions

At PIC #2, each of the alternative solutions developed for the proposed widening of the Cabana Division Road corridor were presented to the public for input. The study team presented a broad spectrum of design solutions to the public to ensure that all probable solutions were considered, and these solutions included:

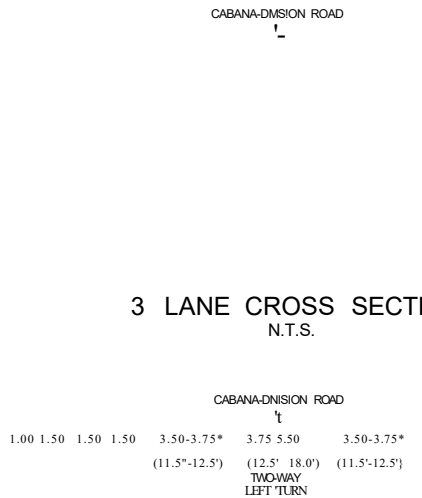
- Do nothing;
- Add bike lanes only;
- Three-lanes;
- Three-lanes plus bike lanes;
- Four-lanes;
- Four-lanes plus bike lanes;
- Five-lanes; and
- Five-lanes plus bike lanes.

Each of the design solutions presented at PIC #2 are described in the following sections and are depicted in **Figure 6.1** and **Figure 6.2.**

Sufficient right-of-way width to widen the road up to five lanes with bike lanes already exists along most of the corridor.

6.2.1 Do Nothing

In any environmental assessment process, the option to maintain the status quo and do nothing must be considered. In some cases, existing environmental constraints inhibit change. Although the technical investigations in this study clearly demonstrated a need to improve movement along the corridor, the alternative to do nothing was presented to the public as an option during PIC #2.



.3 Lane Cross Section Alternatives
Figure 6.1

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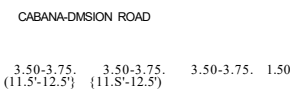

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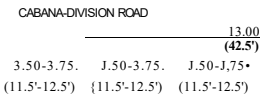
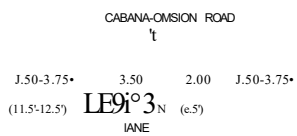


4 LANES + BIKE LANES
N.T.S.



5 LANE CROSS SECTION
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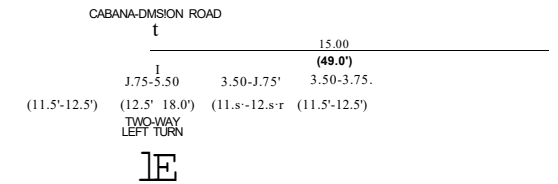

5 LANES + BIKE LANES
N.T.S.

4 & 5 Lane Cross Section Alternatives
Figure 6.2

6.2.2 Add Bike Lanes Only

As described in Section 1.3.1, the section of Cabana Road between California Avenue and Sixth Concession is identified in the City of Windsor's Official Plan as a "Bikeway". The BUMP further identifies the entire length of the corridor for bike lanes. The BUMP also identifies a five-year implementation of bike lanes along the Cabana-Division Road corridor. Due to the City's commitment to build bike lanes along the corridor, this option was presented to the public at PIC #2.

6.2.3 Three Lanes

The option that involves widening the road using the smallest possible level of intervention is the three-lane option. This road configuration involves the addition of a two-way centre left tum lane to the existing two-lane cross-section (see Figure 6.1). This option would provide limited relief from current and projected future traffic conditions, since it retains the same number of through lanes. The left-tum lane provides some traffic relief because it separates left-turning vehicles from the through lanes. This option will not accommodate the projected future traffic volumes within the corridor. This option is also viewed as inefficient, since it would involve a significant cost to the City, and would provide very limited benefit to the community.

6.2.4 Three Lanes Plus Bike Lanes

The option to combine the three-lane configuration with bike lanes on the north and south sides of the corridor was presented to the public. Similar to the three-lane option, this road configuration is not expected to provide maximum benefits to the community in terms of traffic operations, however, it does implement the City's planned vision to accommodate bicycle users along the corridor.

6.2.5 Four Lanes

Widening of the existing two-lane cross-section to four through lanes would improve future traffic conditions. As shown in Figure 6.2, this option consists of four lanes without a center left-tum lane or bike lanes. Therefore, motorists making left turns into the various driveways and streets that intersect the corridor would continue to impede the flow of through traffic.

6.2.6 Four Lanes Plus Bike Lanes

In addition to the four-lane option, the four lanes with bike lanes option was presented to the public at PIC #2. This option was a combination of the four-lane option and the City's plans to add bike lanes on the north and south sides of the Cabana-Division Road corridor.

6.2.7 Five Lanes

The five-lane option consisted of four through lanes (2 lanes in each direction) and a center two-way left tum lane (see Figure 6.2).

The technical investigations that are detailed in Sections 5.1 to 5.3 of this report provided strong evidence to the study team that a five-lane plus bike lane cross-section was required along the corridor in order to accommodate the vehicular through movements projected for the corridor. Additional evidence that supported the need for and feasibility of a five-lane configuration included:

- Sufficient width to build five lanes plus bike lanes already exists throughout most of the corridor;
- A large number of residential properties front on Cabana Road and have direct driveway access to the corridor. Vehicle movements to and from these driveways significantly slows traffic as there is currently only one through lane throughout most of the study area;
- Many residential streets intersect Cabana-Division Road, particularly between Huron Church Road and Provincial Road. Motorists making left turns onto these streets slow traffic along the corridor. A two-way centre left-tum lane would remove these left-turning vehicles from the through travel lanes; and
- Initial designs called for road widening at each of the intersections along the corridor; however, Cabana-Division Road provides access to a high number oflocal roads throughout the study area. These local roads create a high demand for left-hand turns. Thus, a five-lane option was brought forward for reasons of significantly improved traffic operations, lane continuity and cost efficiency.

Therefore the optimal technical solution for future traffic projections is a 5-lane cross section.

6.2.8 Five Lanes Plus Bike Lanes

The option to provide five-lanes plus bike lanes combined the strong technical support for a five-lane cross section with the City's plans for the implementation of bike lanes along the corridor.

6.3 Evaluation

The criteria for evaluation of the design solutions were divided into three primary categories:

- Technical Environment Factors;
- Natural Environment Factors; and
- Social-Cultural and Economic Environment Factors.

A comprehensive review of the interactive effects of each of the evaluation criteria is provided in **Table 6.1.**

Table 6.1: Evaluation of Interactive Environmental Effects

	Desi n Alternatives						
Interactive Effects on the Environment							

LEGEND

- • Full Benefit
- Large Benefit
- t Some Benefit
- • Very Limited Benefit
- No Effect
- Verly Limited Negative Effect
- Some Negative Effect
- Large Negative Effect
- Major Negative Effect

Note: Interactive effects on the environment were evaluated in the context of a 20-year planning horizon.

6.3.1 *Technical Environment* Factors

Do Nothing and Add Bike Lanes Only
The option to do nothing will not add any benefit to the existing or future transportation needs along the corridor. Doing nothing will have no impact on the natural environment, the community, or the local economy.

The option to only add bike lanes will only impart a very limited benefit to existing traffic operations and future traffic demands, since bike lanes accommodate an alternative mode of transportation.

These options provide no technical improvements to the Cabana-Division Road Corridor.

Three Lanes and Three Lanes Plus Bike Lanes
The three lane options add limited benefits to current and projected future traffic demands, since they would only marginally increase the through capacity of the roadway. The two-way centre left tum lane would provide limited relief from existing traffic demands since this lane will displace left-turning motorists, however, these scenarios do not provide adequate capacity for projected future traffic volumes. These options have the least benefit among the road widening options, since they provide the least amount of traffic relief to adjacent divided highways, arterial roads, collector roads and local roads.

Four Lanes and Four Lanes Plus Bike Lanes
The four lane options were not found to be the optimal technical solutions. The widened cross section would improve traffic operations, however left-turning vehicles would still obstruct one lane of through traffic. These options provide less traffic relief to adjacent divided highways, arterial roads, collector roads and local roads than the five lane options. The four-lane cross sections also fail to address the safety concern of rear-end collisions involving vehicles waiting to make left-turns

Five Lanes and Five Lanes Plus Bike Lanes
Current and future traffic demands are fully accommodated by the five lane options. The additional through lanes in this design present the best-available transportation network improvement. The two-way centre left-tum lane further accommodates the flow of traffic by providing storage for vehicles waiting to make left-turns in to driveways and side streets along the corridor. It is expected that the five-lane section will reduce the impact of at-grade railway crossings by reducing the queue during train crossings. The five-lane options impart full benefits to the transportation network in terms of providing traffic relief to adjacent divided highways, arterial roads, collector roads and local roads.

6.3.2 *Natural Environment* Factors

Do Nothing and Add Bike Lanes Only
These options are viewed as having the least impact on the natural environment.

Three Lanes and Three Lanes Plus Bike Lanes
The three-lane options add no benefit to floral and faunal resources, since they require the removal of some oak trees. These options require the removal of the fewest number of trees of all of the roadway widening solutions.

Four Lanes and Four Lanes Plus Bike Lanes
The four-lane options also impart no benefits to floral and faunal resources, since they also require the removal of some oak trees. These options require the removal of fewer oak trees, however, than the five-lane options.

Five Lanes and Five Lanes Plus Bike Lanes
The five-lane options impart no benefit to floral and faunal resources, since these wide cross sections will require the removal of oak trees along the corridor.

6.3.3 Social-Cultural and Economic Environment Factors

Do Nothing and Add Bike Lanes Only

Doing nothing will not have any effect on noise within the corridor but will significantly hurt the local economy as congestion and delays could affect businesses along the corridor.

The addition of bike lanes to the corridor may impart benefits, since bike lanes provide recreational opportunities and broaden the spectrum of potential consumers and employees of local businesses. These bike lanes would implement the vision of the City of Windsor's Bicycle Use Master Plan (BUMP).

Three Lanes and Three Lanes Plus Bike Lanes
The three-lane option would impart limited benefit to the community since the two-way left turn lane will increase the safety of residents when accessing Cabana Road from their driveways. The three lanes plus bike lanes option would impart a slightly larger benefit since bike lanes would provide the recreational and economic benefits associated with all options that include bike lanes. These options are the least economically efficient of the widening options, being comparatively high in relation to the four and five-lane options.

Four Lanes and Four Lanes Plus Bike Lanes
The four-lane options would add very little benefit to the community, since this cross-section does not provide a two-way left turn lane and the safety of residents when accessing Cabana Road from their driveways will not greatly improve. The four lanes plus bike lanes option, however, would impart a slightly larger benefit since bike lanes would provide the recreational and economic benefits associated with all options that include bike lanes.

Five Lanes and Five Lanes Plus Bike Lanes
The five-lane option would impart some benefit to the community since the two-way left turn lane will increase the safety of residents when accessing Cabana Road from their driveways. The five lanes plus bike lanes option would impart a slightly larger benefit since bike lanes provide recreational opportunities and broaden the spectrum of potential consumers and employees of local businesses. These options however, would be the most detrimental in maintaining the residential character of the western portion of the Cabana-Division Road Corridor.

6.4 Public Input

As described in Section 3.4, a clear preference was not identified among the proposed roadway improvements. The top three preferred designs were three-lanes plus bike lanes, four-lanes plus bike lanes, and five lanes plus bike lanes. Providing a design that minimized property acquisition and the removal of oak trees were also priorities among the participants. The details of the input provided by the public during PIC #2 can be found in Appendix B.

7.0 Identification and Refinement of the Alternative Design Concepts (Phase 3)

7.1 *Identification of the Preferred Design Alternative*

Based on the technical evaluation of existing and projected conditions along the corridor as well as the input from the participants at PIC #2, the five-lanes plus bike lanes configuration was presented as the recommended design alternative at PIC #3.

As part of Phase 3 of the Class EA process, the study team identified the recommended design alternative and presented more detailed design concepts for the recommended design to the public. Various design concepts for the five-lanes plus bike lanes recommended alternative were presented to the public at PIC #3 for input in selecting the preferred design.

7.2 *Constraints*

During PIC #2, some participants expressed a desire to preserve old oak trees that line the residential portions of the corridor. As a result, the team designed the widening of the corridor to avoid as many of these trees as possible.

7.3 Public Input

Although the five-lane plus bike lanes design alternative was the optimal technical solution for existing and projected traffic conditions, there was considerable public opposition at PIC #3 against a five-lane cross section. Many of the participants at PIC #3 owned residences along Cabana Road. Those participants that opposed the recommended alternative believed that a five-lane plus bike lanes cross-section would be too wide of a pavement cross-section and would not reflect the residential character of the neighbourhood. The residents of Cabana Road clearly expressed a preference for the three-lane plus bike lanes option, regardless of the technical drawbacks of this configuration. Additional concerns expressed by participants were the unsafe open ditches along the road that provide poor drainage. The details of the input provided by the public during PIC #3 can be found in Appendix B.

The opposition to the five-lane plus bike lanes option at PIC #3 prompted the study team to revisit the technical evaluation and design of the alternatives. The team very carefully reviewed the input given at PIC #3 and determined that returning to Phase 2 of the study to present "tailored" design solutions based on public input would be necessary.

7.4 Refinement of the Design Alternatives

7.4.1 Cabana Road-Northway Avenue to California Avenue (Oak Tree Area)

The stretch of the corridor from Northway Avenue to California Avenue is residential and is characterized by old growth oak trees located near the edge of the travelled portion of the street. Five design alternatives were presented to the public at PIC #3 that showed the road widening in a manner that minimized the removal of oak trees as well as minimizing the need for property

acquisition, and **Table 7.1** summarizes and explains these options. Refer **to Figures 7.1 to 7.5** for illustrations of these design alternatives.

7.4.2 Intersection Alignment of Cabana Road at Howard Avenue

Two alternative design concepts were presented for Cabana Road at its intersection with Howard Avenue. Due to the acute angle at which Cabana Road and Howard Avenue intersect, along with the constraining location of existing commercial buildings at this intersection, the widening of the corridor posed a challenge in arriving at an efficient design of this intersection. Two alternatives were brought forward to the public at PIC #3 for the design of each of the roadways at this intersection. Detailed descriptions of these options are summarized in **Table 7.2.** Refer to **Figures 7.6 to 7.9** for illustrations of these design alternatives.

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LEGEND

ROW Impact

Proposed Sidewalk

Oak Tree

Tree to be Removed

Property Acquisition

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OakTree - Option A

Figure 7.1

Cabana - Division Road Corridor Class Environmental Assessment

LEGEND

ROW Impact

Proposed Sidewalk

Oak Tree

Tree to be Removed

Property Acquisition

SCALE
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Gerry Waldron

Oak Tree - Option B
Figure 7.2

LEGEND

ROW Impact

Proposed Sidewalk

Oak Tree •

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Property Acquisition

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O a Tree - Option C
Figure 7.3

Cabana - Division Road Corridor Class Environmental Assessment

LEGEND

ROW Impact

Proposed Sidewalk

Oak Tree

Tree to be Removed

Property Acquisition

SCALE
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0 10 20 30

Oak Tree - Option D

Figure 7.4

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Gerry Waldron

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LEGEND

ROW Impact

Proposed Sidewalk

Oak Tree

Tree to be Removed

Property Acquisition

SCALE

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0 10 20 30

OakTree - Option E

Figure 7.5

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Archaeologix Inc.

Gerry Waldron

Table 7.2: Comparison of Alternatives - Cabana Road - Howard Avenue Intersection

COMPARISON FACTORS	CABANA ROAD ALTERNATIVES		HOWARD AVENUE ALTERNATIVES	
	Option A 4 lanes with TWLTL · holds property on north side · Intersecting Howard Option I	Option B 4 lanes with TWLTL - hold south west edge of property - widen to the north Intersecting Howard with Option 2	Option I 4 lanes on Howard with LTL · Balanced Alignment (on existing road centreline) · Intersecting Cabana Rd Option A - 3 lanes only shown for initial construction.	Option 2 4 lanes on Howard with LTL -hold south east edge of deli property · Intersecting Cabana Rd Option B
Traffic Onerations				
Capacity	Four through lanes provided with exclusive left turn lane• satisfies project objectives.	Four through lanes provided with exclusive left turn lane - satisfies project objectives.	Ultimate provides for four through lanes with exclusive left turn lane· satisfies project objectives.	Ultimate provides for four through lanes with exclusive left turn lane - satisfies project objectives.
Left Turn Provision	Yes	Yes	Yes	Yes
Access to Businesses	Island on west leg of Cabana will convert Pizza King commercial area and Beckers entrances to right• in I right-out. Island on west leg of Cabana may block entrance to Malibu Mall unless entrance relocated.	Same as Option A	Because Beckers entrance so close to intersection, may want to restrict access to right-in/right-out. Same for entrance to Porcino's south of Howard and the Club Malibu commercial area.	Same as Option I
Utilities				
Impact On Utilities	High voltage hydro line on the north side will require relocation	Same as Option A	Short term, nominal impacts. Long term, will require relocation of hydro line on the east side and all plant located there.	Little impact on west side, pole relocations and all plant require relocation on the north east side. On the south side, short and long term impacts similar to Option J.
Illumination	Will be reconstructed with the roadway construction.	Same as Option A	Will be reconstructed with the roadway construction.	Same as Option 1
Social-Cultural and Economic				
Bike lanes	Bike lanes provided on both sides of Cabana	Bike lane dropped at Pizza King and Beckers but outside lane increased to 3.75m. Bikelane re-introduced either side of Pizza King as quickly as possible.	Bike lanes provided on both sides of Howard.	Bike lane at deli and Porcino's dropped to minimize business and residential impacts. Resuml'<I again to the north and south as quickly as possible.
Properties Affected - Residential	7	10	9	7
Properties Affected - Commercial	6	5	4	4
Businesses Affected	13	14	8	9
Parking Spaces lost	6	3	8	5
Area of Property Required	900Sq. M.	2300Sq.M.	l200Sq.M.	1000
Property Cost	$450,000 - $500,000	$300,000 • $350,000	$275,000 • $325,000	$250,000 - $300,000
Natural Environment				
Trees Removed	4	7		
SUMMARY	While good traffic service including bike lanes provided, have very severe impact on businesses in the area.	Good traffic service provided and severe impact on businesses avoided hut bike lanes dropped through intersection. Have widened the outside lanes somewhat to compensate and bike Janes are resumed either side of the intersection as soon as possible. This option for Cabana is better.	This option also provides good traffic service hut impacts businesses for the ultimate widening.	This option plans for the ultimate widening of Howard while minimizing the impacts on business. As for Cabana, the bike lanes are dropped at the pinch points but resumed to the north and south. This option is recommended over Option 1.

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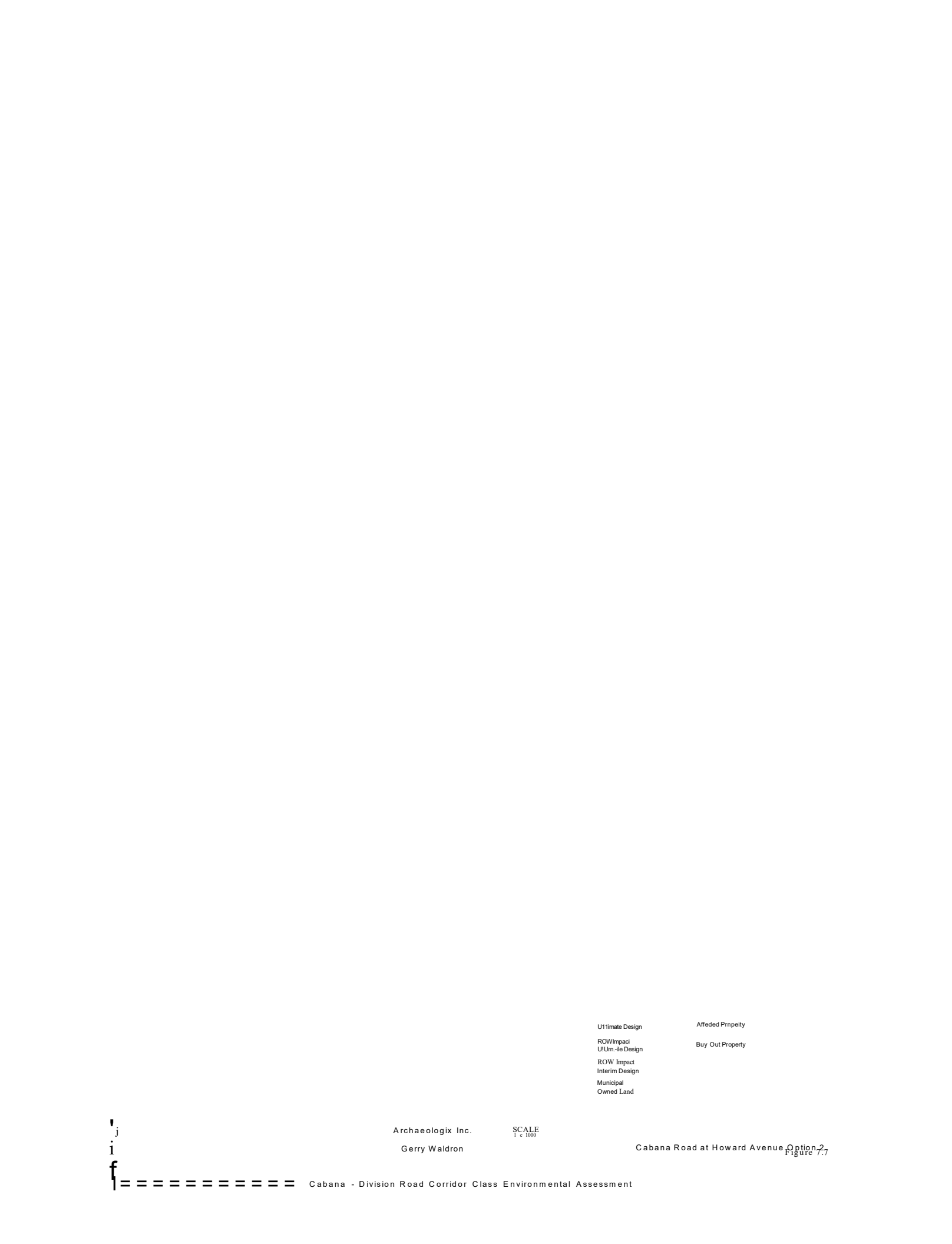
Cabana Road at Howard Avenue Option 1
Figure 7.6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Cabana Road at Howard Avenue Option 2

Figure 7.7

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Cabana Road Alignment Option A with Howard Avenue Alignment Option 1
Figure 7.8

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Proposed
Right of Way

Possible Future
Widening

Property Required

Proposed Pavement 1111

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Cabana Road Alignment Option B with
Howard Avenue Alignment Option 2
Figure 7.9