

ITEM

MANAGER'S REPORT NO.

18

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COUNCIL MEETING 1983 07 25

RE: RELOCATION OF BYRNE CREEK AND FUTURE BYRNE  
ROAD UPGRADING

MUNICIPAL MANAGER'S RECOMMENDATION:

1. *THAT the recommendation of Director Engineering be adopted.*

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TO: MUNICIPAL MANAGER

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FROM: DIRECTOR ENGINEERING

SUBJECT: RELOCATION OF BYRNE CREEK AND FUTURE BYRNE ROAD UPGRADING  
RECOMMENDATION:

1. THAT this report be received for information purposes.

SUMMARY:

The following report provides Council with information on the anticipated cost and proposed standard of upgrading Byrne Road once Byrne Creek has been relocated. The question of an alternative alignment for Byrne Road is discussed and the status of land acquisition is addressed.

REPORT:

1. BACKGROUND:

Council, on 1983 April 11, received a report on the proposed relocation of Byrne Creek at which time approval in principle was granted to the creek relocation as illustrated on the attached Figure 1. The Director Engineering was authorized to proceed with arranging for the preparation of final engineering drawings for the creek relocation, including provision of an estimated cost of constructing the required works. Staff was also authorized to pursue the acquisition of lands for the creek relocation.

Arising out of Council's consideration of this report, the following motion was adopted:

"THAT a report to Council be prepared showing therein the cost of the new Byrne Road, the cost of the possible realignment of the major industrial road going into the Big Bend area, rather than Byrne Road, being a total cost report with all its implications when this subject matter next comes back to Council, including road, drainage and all the others including the land exchange."

2. ROAD ALIGNMENT:

When this question was initially considered by Council staff was requested to provide information on why Byrne Road was chosen for upgrading. On 1978 December 11 a report was submitted to Council outlining the following rationale:

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- (a) Byrne Road is the principal means of existing access into the Big Bend Area; it integrates well with the Municipal conceptual road network and occupies a central location to both the Big Bend area itself and the loop road system proposed for the area.
- (b) The upgrading of Byrne Road to a normal industrial standard is seen as an important prerequisite to the proposed development of the large CD industrial areas south of the tracks. This fact has been stated on numerous occasions by the private development fraternity.
- (c) Given the importance of Byrne Road in the area, the improvement of its ability to function, safety and overall image is considered important to the implementation of the industrial and public open space components of the big Bend Development Plan.
- (d) Alternate alignments in the vicinity of Byrne Road are not considered practical given adjacent proposed land uses, the location of the Agricultural Land Reserve boundaries and the fact that Byrne Road is well established with industry and will eventually have to be upgraded in any event.
- (e) The existing Byrne Road ties in with the staged development strategy for Marine Way which is being undertaken in two phases. The first phase (which is now open to traffic) involves the construction of Marine Way from Boundary Road to Byrne Road, using Byrne Road as a northerly connector to the existing Marine Drive for the continuation of the alignment. The second phase (which is under construction) provides for the continuation of Marine Way through to the Queensborough Bridge.

The salient factor in the foregoing is that Byrne Road is well established with industry and will have to be upgraded in any event. If an alternate route was established the cost of this new facility would simply need to be added to the cost of eventually upgrading the existing Byrne Road to an acceptable industrial standard.

The adoption of the Burnaby Conceptual Transportation Plan in 1979 August reinforced the relationship of Byrne Road to the transportation network in that it provides a primary arterial connection of Marine Way to Tenth Avenue. The designation of Byrne Road between Marine Way and Marine Drive as an integral part of the Marine Way-Tenth Avenue arterial roadway has certain implications on the appropriation of monies for this segment of the future upgrading. Staff has taken the position that the Provincial Government should be responsible for the construction of the Marine Way-Tenth Avenue roadway as it will provide a connection from Marine Way through to the Stormont/McBride roadway, both of which are Ministry of Transportation and Highways arterials. Furthermore, its construction will relieve through demand pressure at the (Annacis System) Queensborough bridgehead. The Ministry's staff has taken the position that this route is a Municipal street which is eligible for revenue sharing. Irrespective of the final decision in this regard, it is evident that the reconstruction of this portion of Byrne Road (Marine Drive to Marine Way) is more logically a part of the Marine Way-Tenth Avenue construction and should not be included in the initial proposal for upgrading Byrne Road. Therefore, the subject of this report is the upgrading of Byrne Road south of Marine Way to Fraser Park Drive (immediately adjacent to the Fraser River).

3. COMPARISON OF CONSTRUCTION METHODS AND PROJECTED COSTS

Initially, about three to four years ago, we had conceived of Byrne Road being upgraded to a 14 metre (46 foot) curb and gutter standard from Marine Drive south to the Fraser River. It was proposed to be constructed in full accordance with the "classic" approach to building roads in peat ground, calling for considerable depths of fill material plus surcharge being placed on the road and in the ditch, with construction taking place over an extensive period of time. It was also proposed that the road would be designed to the Provincial "Design Flood Level" which is 0.61 metres (2 feet) above the 200-year designated flood elevation.

During recent months, your Director Engineering carried out a complete review of the original proposal because, on critical examination, it became obvious that the proposal, although having a theoretically-proper approach, would present a number of severe problems associated with its construction. The major ones are:

- (a) Extremely high cost, both in terms of construction and in additional property acquisition to widen the road.
- (b) The placement of major depths of fill materials on the road would not only require additional road allowance to contain them but would also actually run into existing buildings on private property. The cost associated with protection of those buildings would be extreme, to say the least.
- (c) Severe danger of rupturing one or more of the utility systems on Byrne Road from the extreme weight of the fill. These utilities are:
  - i) Water main.
  - ii) Jet fuel line (to Airport).
  - iii) High pressure natural gas.
  - iv) B.C. Hydro power line (poles).
  - v) B.C. Telephone (poles and some underground duct).

The severance or disruption of all of these utilities are of great concern but especially the jet fuel line and the natural gas line.

- (d) The cost and disruption alone to the public of attempting to maintain traffic flow and property access virtually causes the construction method to be rejected as being not feasible of being employed.

Taking into account all of the foregoing factors caused your Director Engineering to develop the following alternative approach to the reconstruction of Byrne Road:

(a) Proposed Improvements

- i) 14-metre wide pavement.
- ii) Asphaltic concrete curbs.
- iii) 1.5-metre wide crushed limestone walks, both sides.
- iv) Underground storm sewer with catch basins in roadway and service connections to adjacent properties.
- v) Street lighting mounted on B.C. Hydro poles.
- vi) New sanitary sewer system.

(b) Proposed Method of Construction

Prior to any roadworks being undertaken, Byrne Creek must be relocated to the west of the Byrne Road right-of-way.

Owing to existing development on adjacent property, it is not practical to properly surcharge Byrne Road as surcharging would require a fill of about 6 metres above the existing roadway. In order to reduce the problem of settlement, the following construction procedures are proposed:

- i) Excavate a trench a minimum of two metres deep and approximately 5.5 metres wide on each side of the existing pavement and, immediately thereafter, fill the trenches with pit run gravel. This operation will eliminate Byrne Creek on the west side and the ditch on the east side. Drainage from adjacent properties will be affected as they are presently draining into these ditches.
- ii) Install temporary storm sewer to drain adjacent properties and roadway during the construction period.  

This temporary sewer may settle substantially and non-uniformly and will require maintenance during the construction period. In order to minimize the settlement problem, it is proposed to locate the temporary sewer at the west edge of the existing pavement.

In order to be economical, this storm sewer would not be large enough to handle severe winter storms and it would therefore be necessary to perform the work during the summer months.

- iii) The filling operation will induce consolidation of the underlying soils, causing settlement to occur. After an estimated period of three to six months, it is planned to remove all of the pit run gravel, replace at least half of it with hog fuel in the bottom of the trench and replace sufficient pit run gravel to support the roadway.

- iv) Install a new permanent storm sewer. By adopting the above consolidation procedure, it is anticipated that piles will not be required to support the proposed storm sewer.

For purposes of this estimate, the storm sewers are planned to run the entire length of the roadway with no outlets into the proposed Byrne Creek, the reason being that, during a 100-year storm, the level of water in the proposed Byrne Creek will be higher than Byrne Road.

- v) Relocate the power and telephone poles with B.C. Hydro pole-mounted street lights to a suitable location outside the 14-metre paved roadway.
- vi) Install sanitary sewer.
- vii) Construct the 14-metre wide paved roadway about 0.3 - 0.5 metres above the existing roadway, complete with asphaltic curb, catch basins, limestone walks and boulevard grading.

(c) Comments

- i) The new roadway will follow the existing profile fairly closely. As such, it will be neither as aesthetically pleasing nor as uniform as a new roadway would normally be.

- ii) The proposed roadway will be between one and two metres below the 200-year Fraser River flood level but with Byrne Creek being relocated this should not present a problem.
- iii) The existence of a 150 mm diameter jet fuel line and 75 mm high pressure natural gas line under the present roadway must be recognized as potential dangers and work must be performed carefully.
- iv) A 300 mm diameter steel water main is directly under the existing ditch on the east and the fill will induce settlement but the water main is constructed with tie rods to minimize the effect of settlement.
- v) The proposed construction procedures will not eliminate all of the long term settlement. In view of this, concrete curbs and gutters and walks have not been proposed.
- vi) It is felt that by merely filling the existing ditches along-side the existing pavement, a long term, more serious and unacceptably large settlement would be created.

The alternate approach to the reconstruction of Byrne Road is estimated to cost approximately \$3.5 million. The estimate is not based on a final engineering design but it is considered to be a valid preliminary estimate for discussion and programming purposes. By way of comparison, your Director Engineering is of the opinion that the original proposal (full surcharge) would cost approximately three times this amount (i.e. about \$10 million). The relatively minor problems inherent in the alternative approach are well worth accepting in order to save \$6+ million.

The estimate does not include the provision of a sanitary sewer on Byrne Road because the whole question of servicing the entire Big Bend Area with sanitary sewers has still to be examined in detail, including a study of the most suitable technology to be used (e.g. gravity and pump, total pump, vacuum system). Therefore, the provision of sanitary sewers to serve the properties in the area of Byrne Road are merely a part of the overall sanitary sewer servicing questions. It is recognized that there likely will be a sanitary sewer required on Byrne Road itself and for this reason it is important that we have the master servicing plan in place before commencing the reconstruction of Byrne Road as outlined in this report. It would not be realistic and could be misleading to provide now an estimate for the Byrne Road sewer alone because it is only part of a larger picture for which the basic technology to be employed has not yet been selected.

It should be noted that staff is not recommending that Council proceed with the reconstruction of Byrne Road at this time as it is anticipated that it will take approximately 24 - 30 months to complete the relocation of Byrne Creek but it will be considered from the point of view of placing it into an appropriate position in the 5-year Capital Program.

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A financing formula will be developed when the project is considered for inclusion in the Capital Program. However, there are at least two possible methods.

(a) Redirecting "historically annual" appropriations from Storm Drainage to Roads Projects when sufficient funds have been allocated to complete the Byrne Creek Project.

(b) The C.A.W.F. Fund (internal borrowing).

4. LAND ACQUISITIONS

The proposal to utilize a different approach to the upgrading of Byrne Road, as outlined in this report, will have a positive impact on the costs of both acquiring the necessary right-of-way for, and construction of, the roadway. Preliminary indications are that with the creek being relocated it appears to be completely feasible to accomplish the upgrading within the existing 20.12 metre (66 foot) road allowance.

With respect to the acquisition of lands for the relocation of Byrne Creek, the Legal and Lands Department has commenced negotiations with the various private owners as per Council's 1983 April 11 directive. The Canadian National Railway has agreed, in principle, with the proposed land exchange and staff are continuing to meet with C.N.R. representatives to further discuss this proposal.

5. CONCLUSION

The foregoing report provides Council with information on the future upgrading of Byrne Road. It should enable Council to evaluate the current proposal for the relocation of Byrne Creek in the context of the overall objective for implementation of the land use proposals embodied in the Big Bend Development Plan.

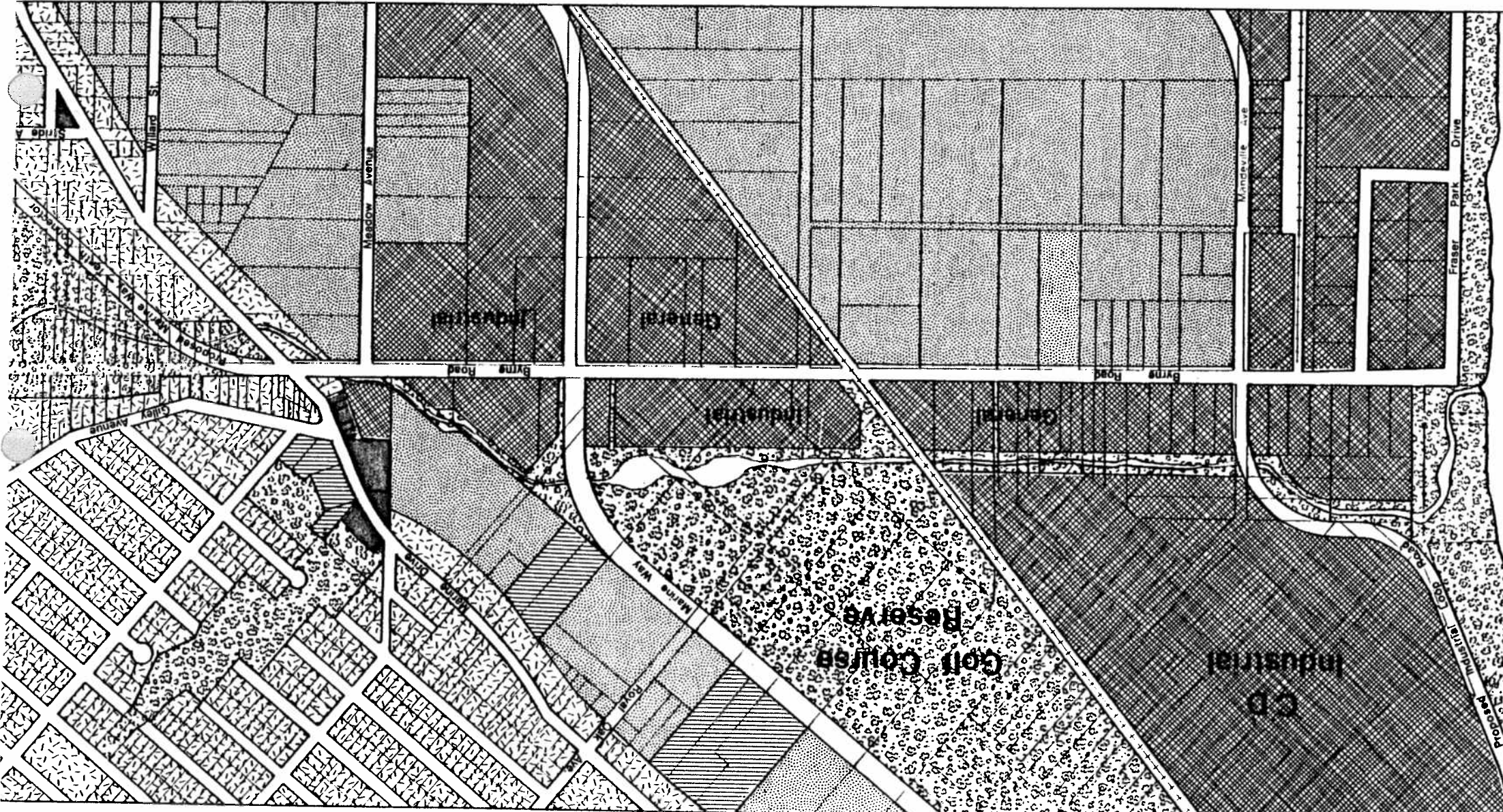
To sum up on the matter of total costs for both of the major components of the Byrne Road project, the Creek relocation portion is estimated to cost \$2.6 million and the road reconstruction portion \$3.5 million, making a total of \$6.1 million (not including provision of sanitary sewer).

  
DIRECTOR ENGINEERING

EEO/PB/ch

c.c. ( ) Director Finance  
( ) Director Planning and Building Inspection

# Byrne Road Industrial Area Land Use Plan






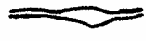



-  Industrial
-  Park
-  Agriculture
-  Proposed Relocation of Byrne Creek
-  Residential
-  Institutional
-  Commercial

Figure 1

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