occurred on Barnet Highway adjacent to the Gulf Refinery. Replies on each of the following inquiries are contained in the <u>attached</u> reports from the Director of Fire Services and the Municipal Engineer:

- 1. Response times
- 2. Type of equipment that responded
- 3. Response time from No.1 Firehall if the railway crossing at Sperling Avenue had been blocked by a train.
- Plans that would be put into effect if such an accident had occurred in a commercial or a populated residential area.
- 5. With regard to the Barnet Highway, provide information on:
 - a. the number and types of accidents that have occurred over the last five years.
 - b. the nature of these accidents.
 - c. adequacy of lighting.
 - d. points of access and egress.
 - e. provision of left turn lanes.
 - f. the possible provision of warning lights.

The role of the R.C.M.P. with respect to an accident in either a relatively isolated area, or an area that is densely populated, is essentially as follows:

 Control all traffic access routes into an out of the disaster area;

- b. Establish a cordon around the disaster area as soon as possible and establish a zone where no one is permitted except authorized persons who are directly involved with the rendering of emergency services.
- c. Assist with the evacuation of people upon the decision being made by officials of the Fire Department that this measure must be undertaken to save life.
- d. Guard property that has been left in evacuated buildings, and take all possible steps to prevent looting and other criminal offences from occurring in a disaster zone.
- e. Conduct a police investigation into the cause of the accident and proceed with any court proceeding as may be required.

If an evacuation is ordered, people in the affected area would be notified by the R.C.M.P. to leave immediately. They could either go to a place of their own choosing, such as the home of a relative or friend, or to an evacuation centre which would be established in a nearby public building such as a recreation building, or if circumstances permit, a school.

RECOMMENDATION:

1. THAT this report be received for information purposes.

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1978 OCTOBER 19

FIRE DEPARTMENT

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MUNICIPAL MANAGER TO:

FROM: DIRECTOR-FIRE SERVICES

SUBJECT: FIRE AT 9900 BLOCK, BARNET HIGHWAY - 78 OCTOBER 14

RECOMMENDATION

THAT this report be received for information purposes.

REPORT

Date of Fire:	1978 October 14	Time Alarm	Received: 09:41 h.
			and the second
Location:	9900 Block Barnet	Highway	

Weather: Extreme fog conditions with clearing trend beginning at approximately 11:30 h.

Vehicles Involved: 1)

Truck:

- owned by Texaco Canada Limited, 8059 Texaco Drive, Burnaby
- driven by PALMER, Trevor Howard Thurley, D.O.B. March 15, 1950
- 1975 International Tractor Model S4370, Licence #513BBL, Municipal Licence #6413, Serial #43747DGA21707, gross weight (GVW) 84,000/lbs. 38,100/kg. approximately

Trailer:

- owned by Texaco Canada Limited, 8059 Texaco Drive, Burnaby
- pulled by above tractor
- 1975 Willock, capacity of tank 7,000 imperial gallons (31,822 litres), load at time of ______ cident 7,000 imperial gallons

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- Licence #03336V, Decal #328461
- 4,400 gallons of Fire Chief (regular) 1,300 gallons Sky Chief (premium) 1,300 gallons lead-free

Car:

2)

- owned and driven by COMO, Joseph Roland Mario, D.O.B. June 29, 1959

- 1977 Triumph TR7, Serial #ACL340870, Licence #XTE 745

Casualties: One (1) adult male, dead.

Response Time by Burnaby Fire Department:

No. 4 Pumper arrived at the fireground from No. 4 Firehall "Duthie" 09:46h.

No. 5 Pumper and Aerial Ladder Truck No. 5 arrived at the fireground from No. 5 Hall "Hastings" 09:49h.

No. 6 Aerial Ladder Truck arrived at the fireground from No. 6 Firehall "Brighton" 09:51h.

No. 1 Pumper arrived at fireground from No. 1 Firehall "Sperling" 09:52h.

Port Moody Fire Department was notified by Burnaby Control at 09:42h. arrived at the fireground at 09:53h.

3) Fireground Procedures

The duty Operational Chief, on being advised the incident was adjacent to the Gulf Oil Company loading ramp, immediately ordered a second alarm, 'with the as noted' response by Burnaby Fire Department and the Port Moody Fire Department.

The initial size-up by the Captain i/c of the first-in Pumper No. 4 denoted a fuel truck trailer carrying approximately 7,000 gallons of gasoline was fully involved by fire, with a private car firmly wedged underneath at a point approximately equi-distant between the front and rear wheels of the trailer.

Due to the intensity of the fire and related damage sustained by the private car in the collision, it must be assumed the driver was then dead.

In keeping with standard practice, Pumper crew No. 4 laid two (2) $2\frac{1}{2}$ hose lines from the nearest hydrant to within approximately 100 feet from the burning fuel tanker with an additional two (2) $2\frac{1}{2}$ hose lines stretched from the Pumper as close as possible to the fire.

With the arrival of Pumper No. 1 at 09:52h. the initial hose lay by Pumper No. 4 was supplemented with 4" diameter hose which allowed for the deployment of two (2) 500 g.p.m. deluge guns and three (3) 24" hand lines. This evolution provided an estimated flow of approximately 1,500 g.p.m.

Having established control of the situation, an evaluation was made of the various factors involved in extinguishing the fire or resorting to controlled burning. It is my considered opinion the decision to allow the tanker contents to burn off under a controlled environment was operationally sound by reason of the following:

- a) The hose streams were most effective in maintaining a cooling effect on the fuel compartments and maintaining their strength.
- b) There was little or no exposure hazard.
- c) Controlled burning eliminated the ecological factor of fuel entering the water-way.
- 1) Notwithstanding the initial response and retention of the equipment on the fireground, two (2) Aerial ladders and one (1) Pumper were available in the event of another fire within the Municipality.
- e) The deceased was adequately protected from further heat radiation.

f) Had extinguishment been resorted to, personnel would have been faced

with the potential problem of gasoline vapours and "flash back", feature not acceptable in view of the proximity of the fuel loading ramps across the highway. The foregoing would have been further compounded with the potentially dangerous task of having to syphon off the unburnt gasoline with its attedant risk to the personnel.

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The fire was finally extinguished at 16:30h. and the deceased recovered at 16:45h.

4) <u>Highway Restrictions</u>

With reference to Courcil's query, what would the effect be, had Sperling Avenue been blocked by a train? A review of the Departmental "running cards" denotes the initial response of Pumper No. 4, Pumper No. 5 and Aerial Ladder truck No. 5 would not have been affected.

However, Pumper No. 1, Rescue No. 1, Equipment Truck No. 1 and possibly the Chief Operational Officer would have been delayed, by the time required for the train to pass or the need to circumvent it by proceeding via Douglas Road or Willingdon.

The importance or critical nature of these delays in this case would have been lessened insofar as the rescue and equipment trucks were not required immediately at the fireground. The delay encountered by the Chief Officer would also have been partially offset by his immediate and correct assessment of the situation in calling for a second alarm which, when related to the preplanning programs and effective radio communications, allowed for the initial deployment of hose streams as noted by the officer in charge of Pumper No. 4.

5) <u>Review of a Similar Incident in the Willingdon - Union Street Area</u>

Had a similar incident occurred at the junction of Willingdon and Union Street, the responding Chief Officer undoubtably would have been faced with additional life-hazard problems in his initial "size-up".

Factors affecting his course of action being predicated on the following subheadings:

a) rescue

- b) exposures
- c) confinement
- d) suppression

Rescue

Initial efforts would be directed towards removing trapped residents from their homes and pedestrians possibly struck down by the vehicles.

As a supplement to this action, hose lines would be deployed to reduce the heat radiation and permit personnel equipped in close proximity suits "of which the rescue truck has two" to approach and effect the necessary rescues which could not normally be carried out by personnel in service clothing.

Exposures

Fundamentally, the need to protect exposures is only secondary in importance to that of rescue, so that any course of action contemplated would have to be carefully weighed against the danger of creating additional hazards which could not be controlled at a later period.

By way of example, it is most necessary that the Chief Officer have a complete understanding of the flammable liquid involved, which, in this case, has been established as gasoline.

Factors to be considered when dealing with gasoline are:

- i) its vapour density
- ii) flash point

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- iii) explosive range
- iv) specific gravity
- v) ignition temperature

A knowledge of which points to the following: gasoling vapours being heavier than almostly follow the contours: of the roadway and this ontrance to basements the following of the roadway and the ontrance to basements

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and sewers where they may accumulate to the point of reaching their flammable limits of 1.4%, 7.6% where production of an electrical arc, or the simple act of switching on a light switch could then produce a ready source of ignition and explosion.

Recognizing the sensitivity of gasoline in free vapour form will, therefore, be most critical should the Chief Officer elect to extinguish the fire rather than allow it to burn off under a controlled environment.

It is recognized the decision to extinguish the burning fuel may be governed by certain external pressures ranging from the ecological to the need for rescue. Whatever the reason, the process of extinguishment once undertaken should not be interrupted until the task is complete, otherwise the danger of flash back and re-ignition will always be present.

To accomplish the task of total extinguishment it would be expected and "by no way is a complete list intended" the following factors will be considered and provided for:

- 1. Evacuation of the surrounding area with its need to provide accomodation for the displaced;
- 2. Patrols to prevent looting;
- 3. Closing of all doors and windows, especially in basements and low areas;
- 4. Cutting off electrical circuits and sources of ignition;
- 5. Sufficient foam compound available to provide for total extinguishment and the maintaining of a foam blanket supplemented by the foam tender from the refineries Mutual Aid Program;
- 6. Traffic and crowd control;
- 7. Reducing the possibility of gasoline entering the storm sewers; this might well entail the need for the Department of Engineering to provide sand bags and/or gravel;
- 8. Availability of the appropriate explosive-proof equipment to syphon off the unburned gasoline when final extinguishment is completed.
- 6) CONCLUSION

To project a course of action in firefighting is most difficult due to the many variables involved. As such, it becomes most obvious that the art of firefighting is, by necessity, an inexact one, calling as it does for instant command decisions before all of the facts can be established.

Having stated the foregoing, it must be concluded each incident has to be evaluated at the time of occurence and as such precludes a set pattern of approach.

This, of course, does not preclude the obvious need for a close inter-departmental relationship between Fire-Police-Engineering-Health and the private carriers to establish an effective working relationship in the disaster area.

Mairn DIRECTOR-FIRE SERVICES TGN/jlm

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TO: MUNICIPAL MANAGER

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FROM: MUNICIPAL ENGINEER

SUBJECT: ACCIDENT ON BARNET HIGHWAY COUNCIL ENQUIRIES - COUNCIL MEETING 1978 OCTOBER 16

RECOMMENDATION:

1. THAT this report be received for information purposes.

REPORT

As an introduction we would advise that the Barnet Highway is classified as a Provincial Arterial Highway. While the arterial runs completely across the northern part of Burnaby in an east/west direction it is only the eastern 4.10 kilometres (2.6 miles) that is called Barnet, the remainder is Inlet Drive and Hastings Street. That section known as Barnet Highway running from the Port Moody boundary to the intersection of Barnet Road and Barnet Highway is presently constructed to a two lane standard (one 3.6 metre or 12 foot lane in each direction) with 1.5 metre paved shoulders. The only change in this standard is at the Gulf Oil Refinery where a widened pavement accommodates a painted westbound left turn lane into Gulf Oil and an additional 3.6 metre lane westbound from Kask Concrete to Inlet Drive.

In complying with Council's request we will comment on a number of items to be listed numerically:

1. The Number and Types of Accidents That have Occurred over the Last Five Years.

As the complete accident history of any street is only kept locally for about two years we are only able to summarize those accidents that have occurred since 1976 January 01.

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VEHICLE ACCIDENTS BARNET HIGHWAY Type 1976 1977 Oct/1978 Total Out of Control 11 11 18 40 (l_fatal) Hit and Run 2 1 0 3 Side Swipe 3 6 6 15 Hit Deer 1 1 1 3 Right Angle Turn 3 5 3 11 (l fatal) Rear Ender 6 10 3 19 (l fatal) Head On 0 3 2 5 (l fatal) Backing Up 0 0 2 2 TOTAL 26 37 35 98

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2. The Nature of These Accidents

When one reads over the comments of the drivers involved in the above accidents it would appear that the vast majority are driver caused rather than the condition of the highway. The reasons given for the out of control accidents are: ice on road, swerving to miss turning vehicle, fell asleep, lighting cigarette, excessive speed, etc. The side swipes are related mostly to passing when unsafe to do so. The rear enders of course are related to following too close. One reason given in many of the accidents reports has been restricted vision due to fog. A condition of fog along Barnet Highway is quite common especially during the Fall and Winter months (October to end of March). Using the 1976 and 1977 figures of 63 accidents we found 43 or 68% occurred during daylight hours. Of the 63 accidents 37 or 59% occurred during the period October to end of March.

3. Lighting

The subject section of highway is or could be termed a rural arterial highway and as such has very limited street lighting. At the present time we have a total of eight mercury vapour lights along the highway and these were leased from the B.C. Hydro to illuminate sections of the highway that had previous sight problems. In July of this year we wrote to the B.C. Hydro requesting them to investigate the possibility of installing additional lighting at existing bus stops, some of which were without any lighting.

While we do not feel that it is necessary to illuminate the entire length of the Barnet Highway it would most certainly be desirable to place lights at all major access points and over existing bus stops. The latter we have already underway and will now be applying to the B.C. Hydro for additional lease lighting. Because of the prevailing fog conditions along this highway we will be asking Hydro to consider the use of sodium vapour lighting as they have better fog penetrating qualities.

4. Points of Access and Egress

There are a total of thirteen useable accesses along the Barnet Highway, however, only seven are considered to be used to any extent by large trucks. These accesses would be:

(a) (b) (c) (d) (e)	 a) Kask Concrete b) Texaco Drive c) Barnet Beach d) Allied Chemical e) Bestwood Lumber f) Gulf Oil 	149 64 65 61 74	- one a - one a - one a - one a - one a - two a	access access access access access access access on son	
(a) (e) (f)		41-19 17-192			on south side -
			one Mood	on north ly	side is in Port

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Of the above seven only four are used by vehicles carrying explosive or toxic products:

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 Texaco Drive - Three gas trucks in and out daily.
 Allied Chemical - One tanker of sulphuric acid daily. Two loads of

powdered chemicals. 3. Gulf Oil (2 crossings) - 40 trucks in and out daily. A third crossing to the north just inside Port Moody handles up to 40 trips per day. These are packaged produce (drums and cans of oil and grease) and are, therefore, not as critical as gasoline.

5. Provision 'of Left Turn Lanes

The only driveway of the seven mentioned above that presently has a left turn lane (painted) is the westerly access to the Gulf Oil and is for the westbound traffic. This incidentally is the location of the subject accident.

The provision of additional left turn lanes will be considered by the Ministry of Highways when they are designing the upgrading of the Barnet Highway.

6. The Possible Provision of Warning Lights

When the term warning lights is used most people immediately think of an overhead amber flasher. While these devices are quite easy to install it has been found that they have very little effect on the speed of the daily commuter who is only being advised of a possible hazard but not being required to either slow down or stop. These devices eventually become more of a reference to where one is than as a safety device, particularly if they are placed over reasonably straight stretches of roadway; however, if the warning lights is accompanied by a sign message advising what the warning is for it could have a more positive effect on alerting the driver.

While we may warn the highway driver of the presence of turning trucks at a specific location the potential for running into such a vehicle is present everywhere. These vehicles are stopping and left turning into and out of numerous driveways and side streets throughout the Municipality creating a potential for a fatal underride accident. As an example there were a total of 571 fatal <u>underride</u> accidents in the U.S.A. in 1976, involving car/truck collisions (308 rear impacts and '263 side impacts). It would appear that a more positive approach would be to enhance the nighttime conspicuity of large trucks and trailers particularly when they are at right angles to the main flow of traffic. This condition not only occurs when left turning or crossing an intersection but is also present whenever such vehicles are using the street as a maneuvering area to back into private property.

On 1978 October 30 we met with officials of the Ministry of Highways and Gulf Oil to discuss the measures that could be taken to lessen the possibility of future accidents at the main access to Gulf Oil. In the long term, during the future upgrading of the Barnet Highway raised channelization will be provided for the left turning traffic into the westerly south driveway and the north driveway in Port Moody. The easterly driveway on the southside will be restricted to right turns out only. In the interim the Ministry of Highways are prepared to install a vehicle actuated

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signal at the westerly driveway. This signal will include the standard advance flashers "prepare to stop when amber flashing". They also advised that they will be reducing the existing 80 kmh speed limit to 70 kmh and placing advance warning of gasoline trucks turning ahead.

In summary the immediate action to be taken on the Barnet Highway will be:

- Install larger advance signing warning of gasoline trucks turning.
- 2. The installation of additional lighting at bus stop locations and at all major access locations. These lights to be sodium vapour if possible.
- 3. Reduction of the existing 80 kmh speed limit to 70 kmh.
- 4. Consideration of a vehicle actuated traffic signal with advance warning flashers.

In the longer term the Ministry of Highways will be upgrading the entire length of the Barnet Highway to a four lane standard. During the design of this upgrading consideration will be given to providing channelization where possible for left turns into major vehicle access points.

The above report is for the information of Council.

ICIPAL ENGINER

HB/ch

c.c. () Traffic Supervisor

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