On 1978 October 16, Council requested a report on an accident which recently occurred on Barnet Highway adjacent to the Gulf Refinery. Replies on each of the following inquiries are contained in the attached 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.
4. 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 Highuay, 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:
a. 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.
TO: $\quad$ MNNICIPAL MANAGER
FROM: $\quad$ 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 $14 \quad$ Time Alarm Received: $09: 41 \mathrm{~h}$.

## Location:

9900 Block Barnet Highway
Weather: Extreme fog conditions with clearing trend beginning at approxinately 11:30 h .

1) Vehicles Involved:

Truck:

- Owned by Texaco Canada Limited, 8059 Texaco Drive, Burnaby
- driven by PAMMR, Trevor Howard Thurloy, D.0.B. March 1.5, 1950
- 1975 International Tractor Modol S4370, Licence \#51313b, Municipal Licence \#16413, Serial H43747DGA21707, gross weight (GWW) $84,000 / 1 \mathrm{lbs}$. $38,100 / \mathrm{kg}$. approximately
Traillor:
- owned by Texaco Cannda Limited, 8059 Toxaco Drivo, Bumaloy
- pulled by above tractor
- 1975 Willock, cmacity of tank 7,000 imperial gallons (31,822 litres), zqad at time of cident 7,000 impexial gallons
? M M M
- Licence \#03336V, Decal \#328461
- 4,400 gallons of Fire Chief (regular) - 1,300 gallons Sky Chief (premilim) 1,300 gallons lead-free
Car:
- 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.
2) Response Time by Burnaby Fire Department:

No. 4 Pumper arrived at the fireground from No. 4 Firehall "Duthie" 09:46h.
№. 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 'Spering" 09:52h.
Port Moody Fire Department was notified by Bumaby 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
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 underneatil 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) $2 \frac{1}{2}{ }^{\prime \prime}$ hose lines stretched from the Pumper as close as possible to the fire.

With the arrival of Pumper No. 1 at $09: 52 \mathrm{~h}$. the initial hose lay by Pumper No, 4 was supplemented with $4^{\prime \prime}$ diameter hose which allowed for the deployment of two (2) $500 \mathrm{~g} . \mathrm{p} . \mathrm{m}$. deluge guns and three (3) $2{ }^{1 / 2}{ }^{\prime \prime}$ hand lines. This evolution provided an estimated flow of approximately $1,500 \mathrm{~g} . \mathrm{p} . \mathrm{m}$.
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 oxposure hazard.
c) Controlled burming oliminated the ecological factor of fuel ontering the water-way.
d) 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 arother fire within the Municipality.
e) The deceased was adequately protected fron further heat radiation.
f) Elad extinguishnont been resortod to, personnel would have boen faced With the potential problem of gasoline vapours and "fiash back",
featura not acceptable in viow of the proximity of the fuol loading ramps across the hieghay.

The foregoing would have been further compounded with the potentialiy Gangercus task of having to syphon off the unbumt gasoline with its attedant risk to the personne1.

The fire was finaliy extinguished at $16: 30 \mathrm{~h}$. and the deceased recovered at $16: 45 \mathrm{~h}$.
4) Highway Restrictions

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

However, Pumper No. 1, Rescue No. 1, Equipment Truck No. 1 and possibiy 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 imediately at the fireground. The delay encountered by the Chief Officer would alsc nave been partially offset by his immediate and correct assessment of the situation in calling for a second alarm which, when related to the preplanning prograns and effective radio communications, allowed for the initial deployment of hose streans as noted by the officer in charge of Pumper No. 4.
5) Review of a Similar Incident in the Willingdon - Union Street Area

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 vehiclos.

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

## Exposures

Fundamentally, the need to protect exposures is only secondary in importanco to that of rescue, so that any course of action contemplatod would have to be carofully woighed against the danger of creating additional haards which could not: bo controlled at a later period.

By way of example, it is most necessary that the Chiof officer have a complete understanding of the flamnable liquid involved, which, in this case, has beea established as gasoline.

Factors to be considered when doaling with gasoline are:
i.) its vapour density:
ji.) flasl point
iii) explosive range
iv) specific gravity
v) igaition tomperature

A knowndge of whey oint- to the following: gum. vapour bung howict


and sewers where they may accumulate to the point of reaching tric. flamable 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, therofore, be most critical should the Chief Officer elect to extinguish the fire rather than allow it to burn off under a controlled environnent.

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 reseuc. 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 consiciered tio 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 extinguishent and the maintaining of a foam blanket supplemented by the foam tender from the refineries Mutual Aid Program;
6. Traffic and crowd contro1;
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 comnand 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 obvicus need for a close inter-departnental relationship between Fire-Police-Engineering-Health and the private carriers to establish andective working relationship in the disaster area.

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 $4.10 \mathrm{kilo-}$ metres ( 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 drrection) 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 atreet is only kept locally for about two years we are only able to summarize those accidents that have occurred since 1976 January 01.

## VEHICLE ACCIDENTS BARNET HIGHWAY

| Type | 1976 | 1977 | Oct/1978 | Total |
| :---: | :---: | :---: | :---: | :---: |
| Out of Control | $\begin{gathered} 11 \\ \left(1 \frac{\text { fatal }}{}\right. \end{gathered}$ | 11 | 18 | 40 |
| 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 |
| Rear Ender | 6 |  | (1) fatal) |  |
| Rear Ender | 6 | $1 \text { fatal) }$ | 3 | 19 |
| Head On | 0 | - 3 | 2 | 5 |
| Backing Up | 0 | $\begin{aligned} & \text { fatal) } \\ & 0 \end{aligned}$ | 2 | 2 |
| TOTAL | 26 | 37 | 35 | 98 |

## 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 ioctober 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 itt 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 jighting 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 bo:

| (a) | Kask Concrete | - one access |
| :---: | :---: | :---: |
| (b) | Texaco Drive | one access |
| (c) | Barnet Beach | - one access |
| (d) | Allifed Chemical | one access |
| (c) | Bestwood Lumber | one a,coss |
| (f.) | Gulf oil. | - two accesses on south side one on north side is in Port Moody |

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

1. Texaco Drive - Three gas trucks in and
2. Aliind 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 underride accidents in the U.S.A. in 1976, involving car/truck colijisions ( 308 rear impacts and (263 side impacte). 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 onj. $y$ occurs whon left turning or crosging an intersection but is aiso 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 oij. to djecuss the measures that could de takon to lessen the possibidity of future acojdonts at the main acoess to Gulf oil. In the long term, during the future upgrading of tho Barnet Highway ratsed channelization will be provided for the deft turndig traffic into the westeriy south drivoway and the mon! driveway in Port Moody. The easterly drivoway on the southside will be restifoted to right: turns out only. In the interim the Minibtry of Highways are prepared to inmtall a vehiche actuabed
signal at the westerly driveway. This signal will inclucle 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:

1. 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.

## $\mathrm{HB} / \mathrm{Ch}$

c.c. () Traffic Supervisor

