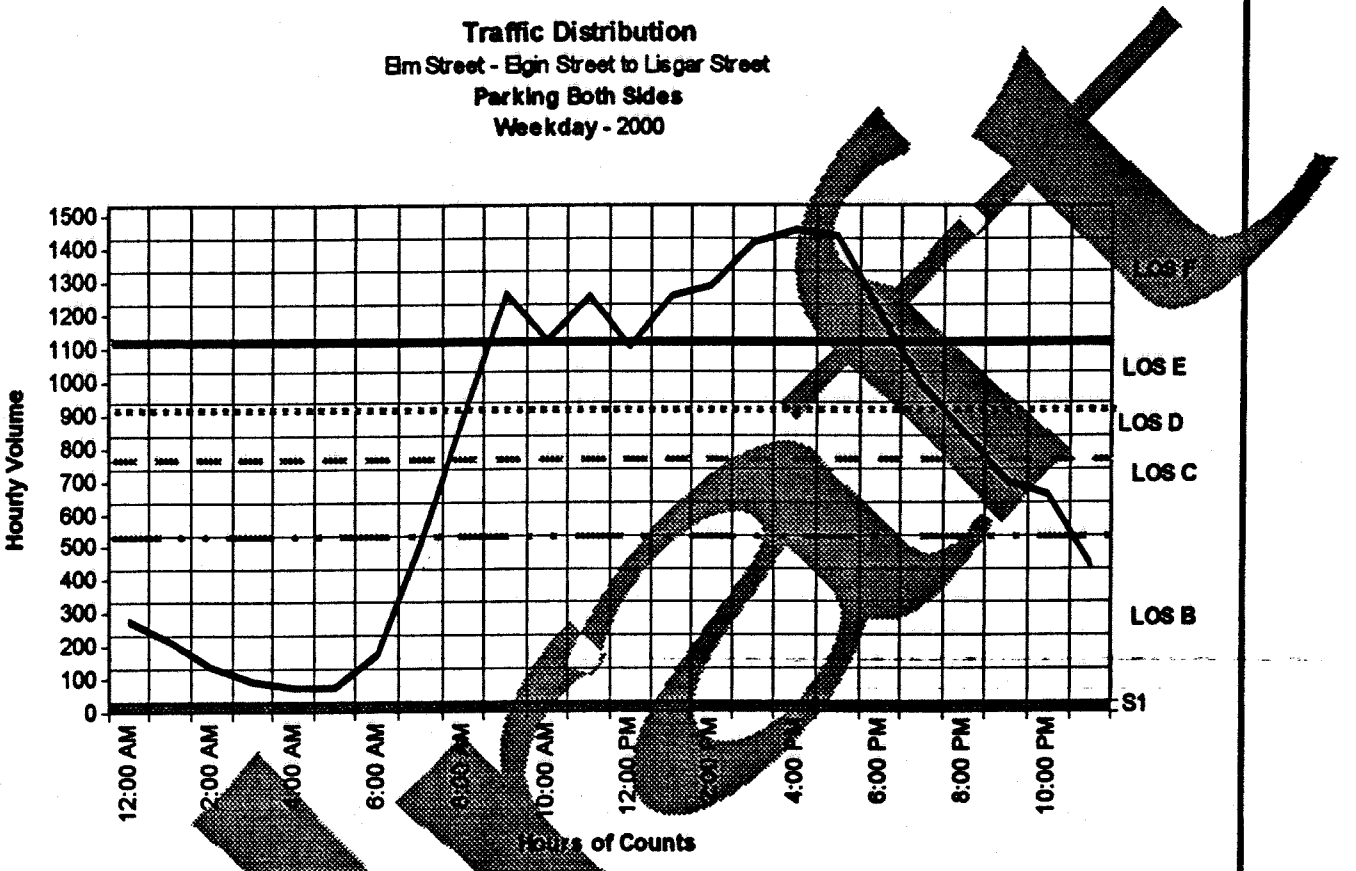
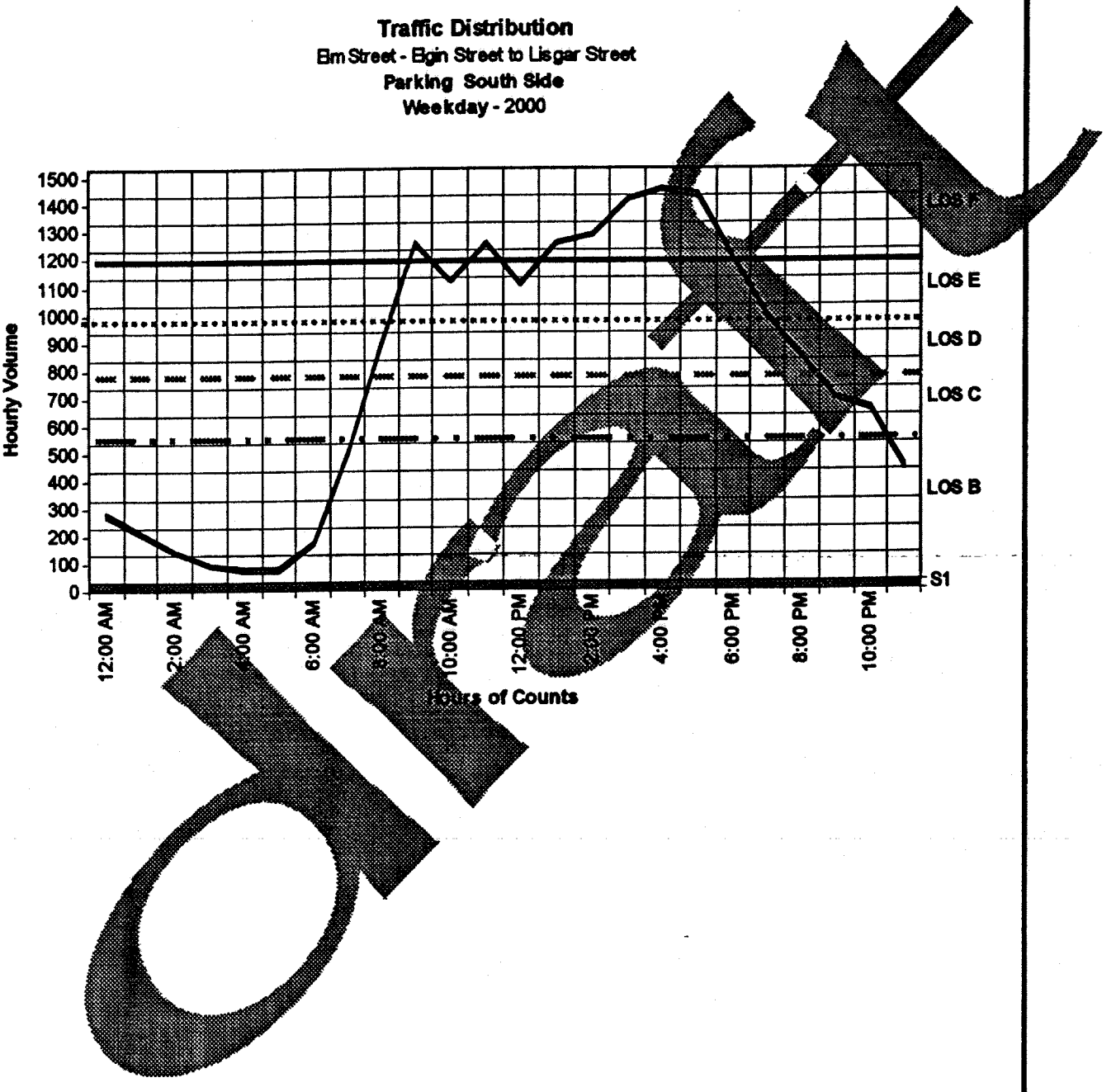
traffic congestion should parking be installed. There would be extreme congestion LOS "F" from 9:00 am till 6:00 pm during the weekdays. On the weekends the congestion would climb to LOS "D" long delays and LOS "F" severe congestion, no movement from 12:00 noon until 4:00 pm.

This analysis indicates that the implementation of on-street parking would have such a



serious affect that Elm Street could not satisfy the demand of the traffic. There would be a demand of 350 to 450 additional vehicular trips per hour for 11 hours that could not be supplied by Elm Street. These trips will find alternate routes. These routes are via Regent-Douglas-Brady for the traffic from Lorne Street and the present Area Municipalities of Onaping-Falls and Rayside-Balfour that would like to go to and from the Kingsway. Beatty-Frood-Kathleen, as well as College-Evergreen-St. Anne routes would be taken by those wanting to go to Notre Dame. As indicated, the creation of congestion will not alter the demand. The additional congestion will be transferred to other routes.

The same form of analysis was carried out for parking along the north and south sides during the weekday. The following graph **(Elm Street Parking South Side Weekday)** shows that by implementing parking along one side there is still congestion and up to LOS "F" (no movement). Though more vehicles can go through, the demand will still not be satisfied and up to 300 vehicles per hour for up to 10 hours would seek other less direct routes around the CBD.



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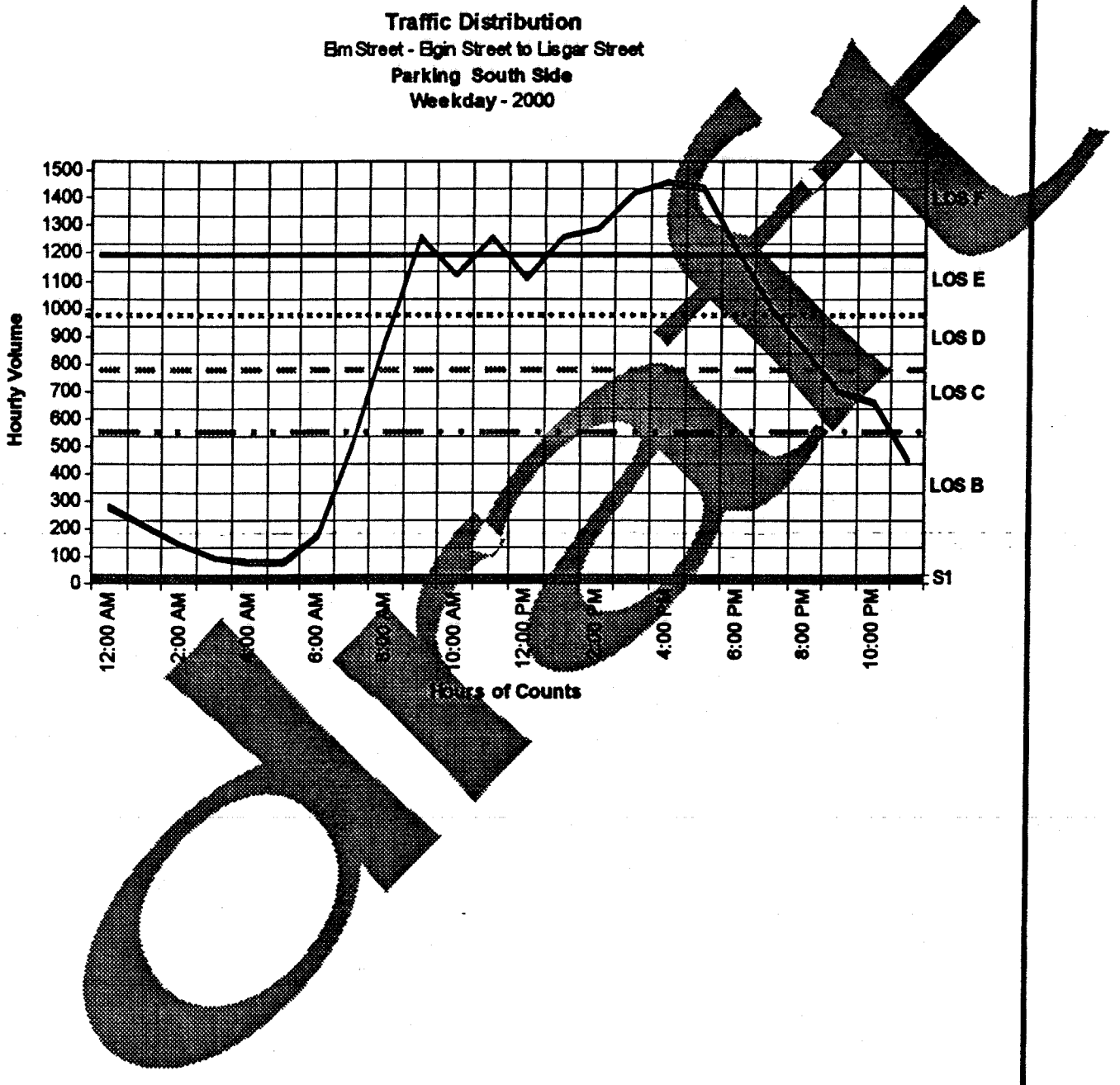
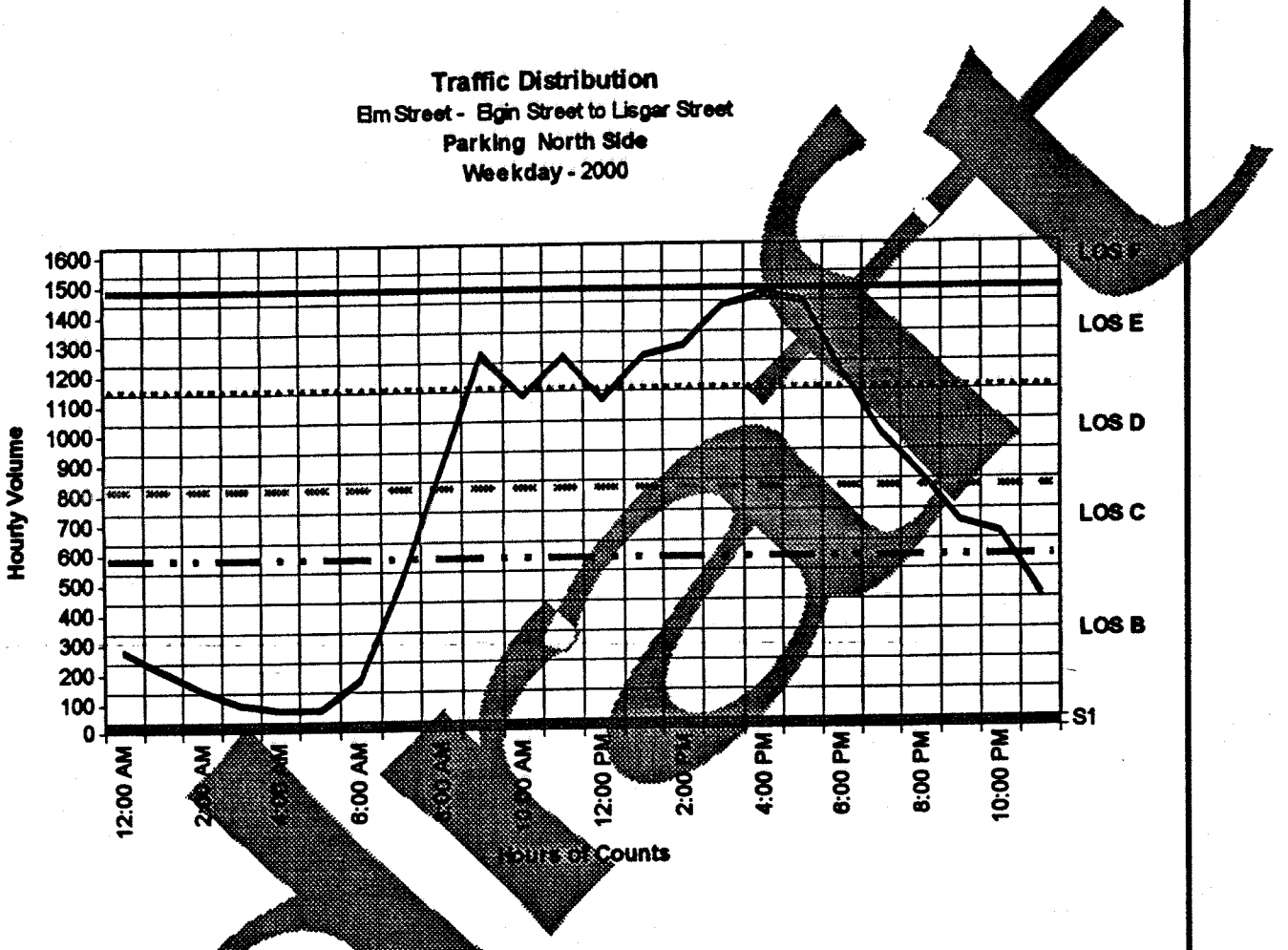


An analysis was also conducted with parking permitted along the north side. The following graph **(Elm Street Parking North Side Weekday)** indicates that the level of congestion was reduced to LOS "E" (very long traffic delays). The increased vehicle carrying capacity is due to the ability to deal with left turns at the intersections. The congestion is still higher than desirable within the Region.

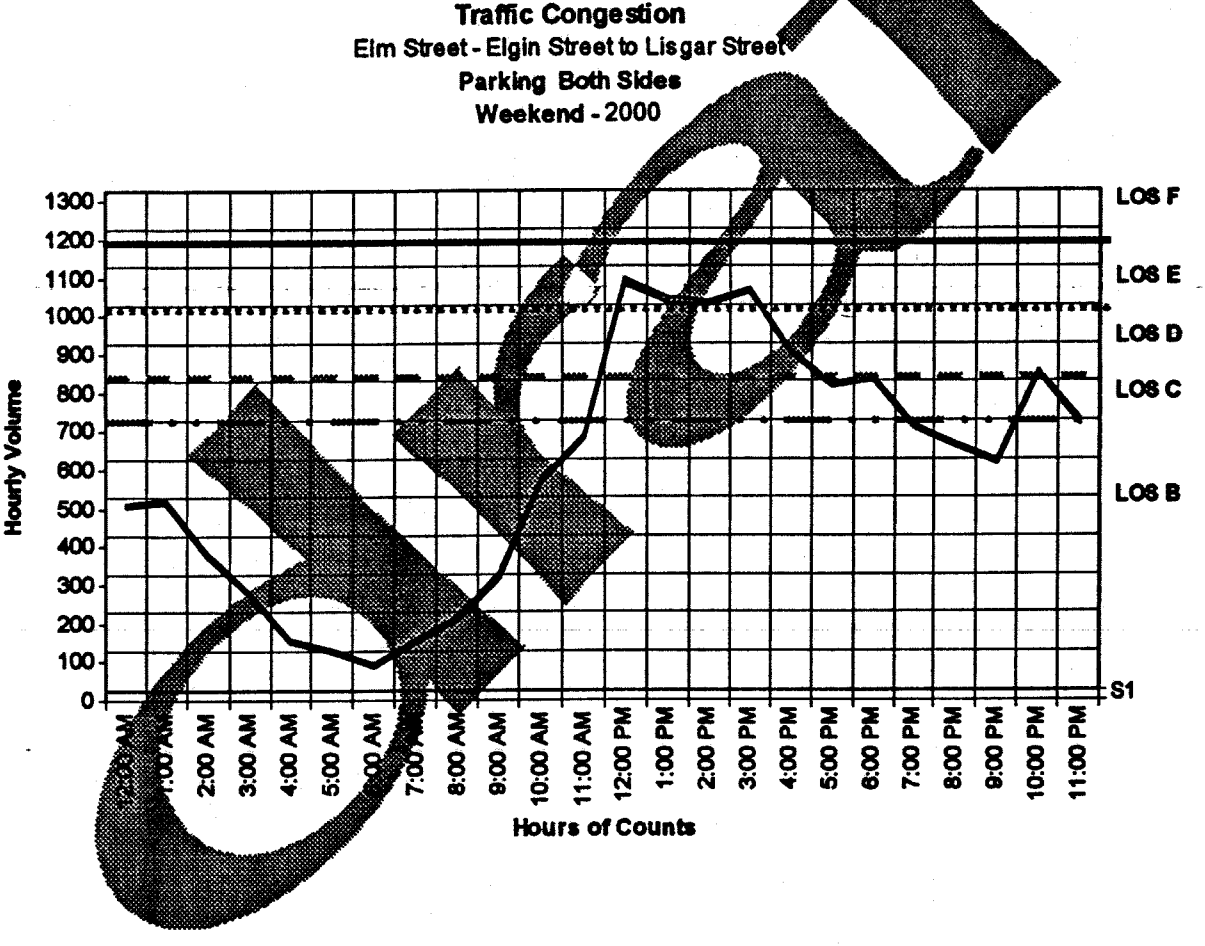


TRAINS

At present queuing along Elm Street due to the closing of the rail crossing causes substantial delays. All three on-street parking scenarios create a level of congestion that will make the clearing of traffic queues along Elm Street associated with train related stoppages difficult. At present these are of some concern and any reduction in the ability of the Elm Street corridor to clear the queued traffic will create safety concerns that we will not be able to address.

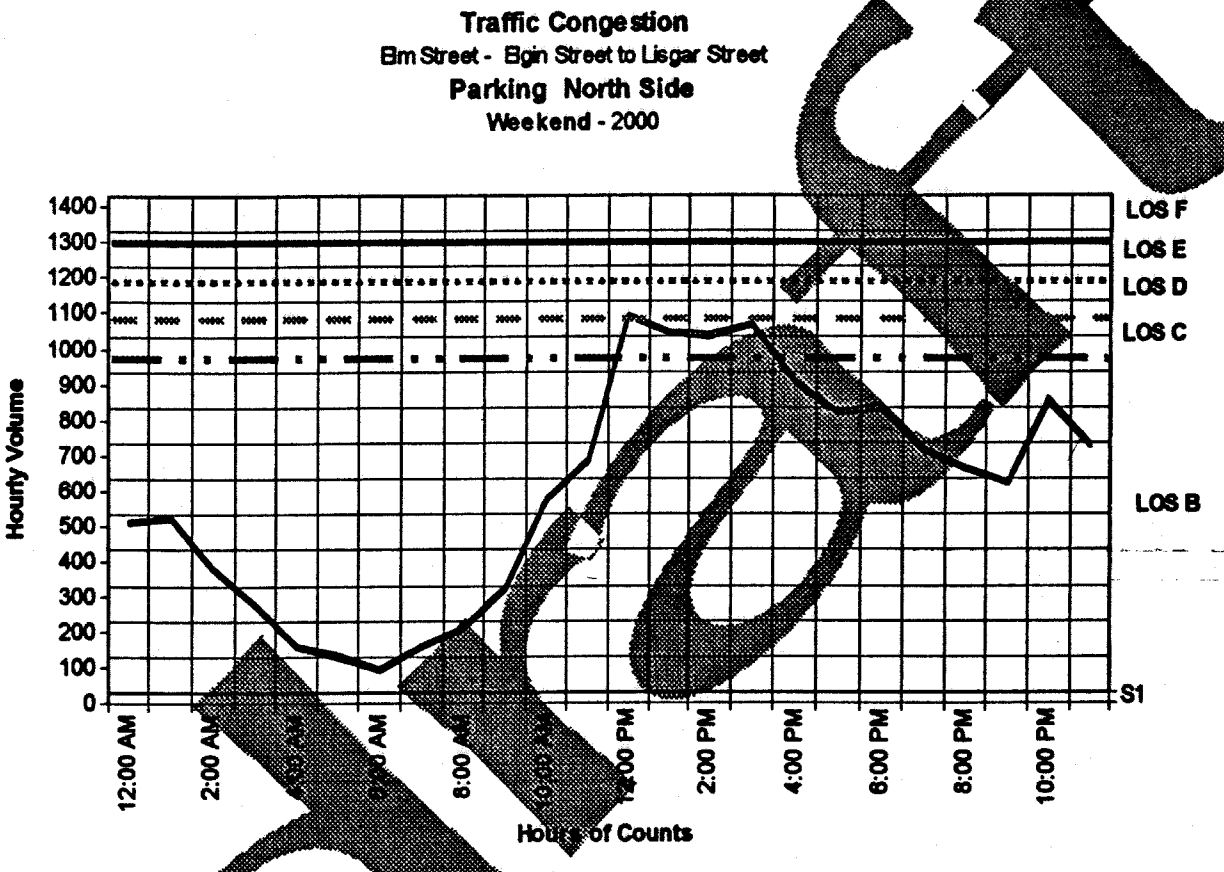
The question was raised regarding the possibility of having parking permitted on Elm Street only on the weekends. The same form of analysis was carried out for the weekends in the following three graphs **(Elm Street Parking Both Sides Weekend), (Elm Street Parking South Side Weekend),** and **(Elm Street Parking North Side Weekend).**

As can be seen in the data, the implementation of parking along both sides of Elm Street will still produce an increased level of congestion. The weekend still represents a high traffic demand that Elm Street will not be able to handle without "long traffic delays", LOS D to "very long traffic delays" LOS "F" between noon and 3:00 p.m. Again these delays will see some redirecting of traffic.



The remaining two graphs **(Elm Street Parking North Side, Weekend)** and **(Elm Street Parking South Side, Weekend)** indicate that the implementation of parking along the north side would increase the congestion to levels of service to LOS "C" and LOS "D" during the same time period.

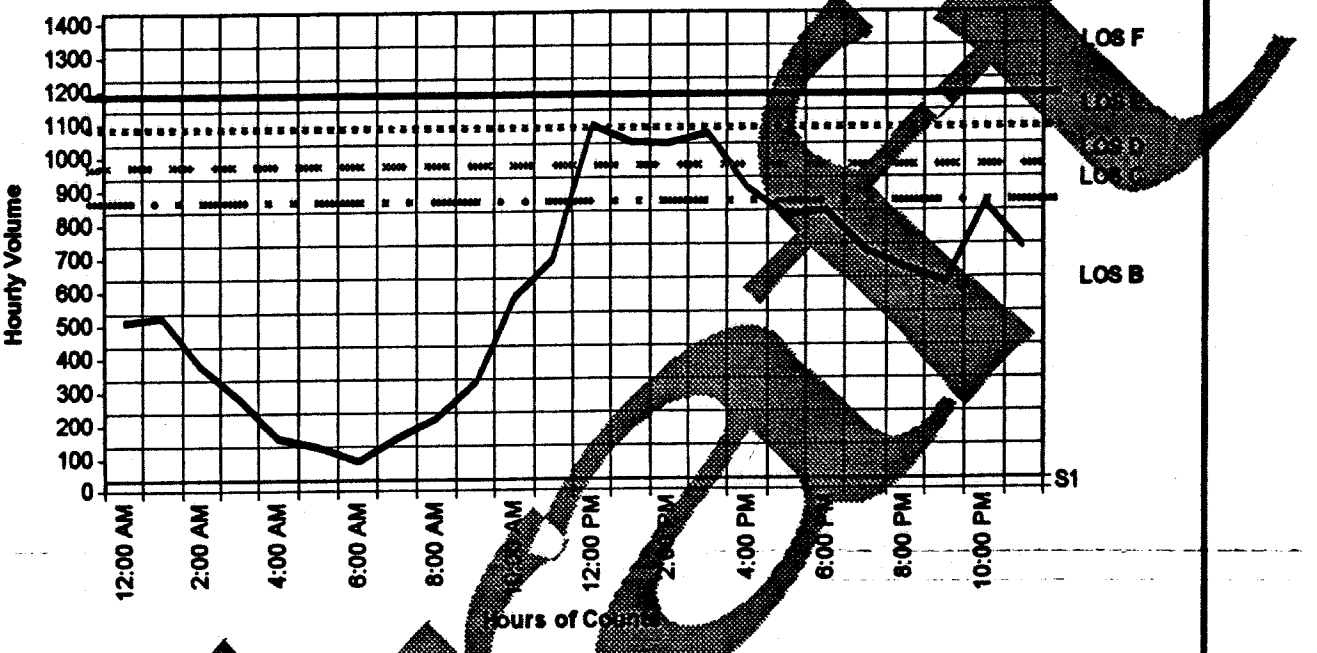
The data indicates that there still is a demand for roadway capacity that can be supplied on Elm Street with parking on the north without substantially high levels of congestion, though a higher level of congestion than what presently occurs.



It should be pointed out that at present, on-street parking at meters is free on the weekends. The parking that would occur would be free parking with a cost of additional signing.

The removal of two through lanes to allow for parking along the **south side** is more dramatic on traffic congestion. This relates to the existing left turn movements and the requirement to satisfy the demands.

Traffic Congestion
Elm Street - Elgin Street to Lisgar Street
Parking South Side
Weekend - 2000



Structural concerns should also be addressed at this time. The assumption made to arrive at the capacity calculations is that there would be left turn lanes as required. These would not be in place if parking is implemented during the weekends only. The effect on the capacity of the system would be to increase the congestion previously indicated.

ENVIRONMENTAL

The Region's Traffic and Transportation section now analyses the environmental impacts of traffic alterations such as implementing parking along Elm Street. The analysis of the three on-street parking scenarios is based in part on the effects of vehicle delays and changes in greenhouse gas emissions. The following **Exhibit O,** outlines the relationship of vehicular speeds and emissions of Nitrogen Oxides **(NOx)** and Hydro Carbons **(HC)** such as carbon monoxide.

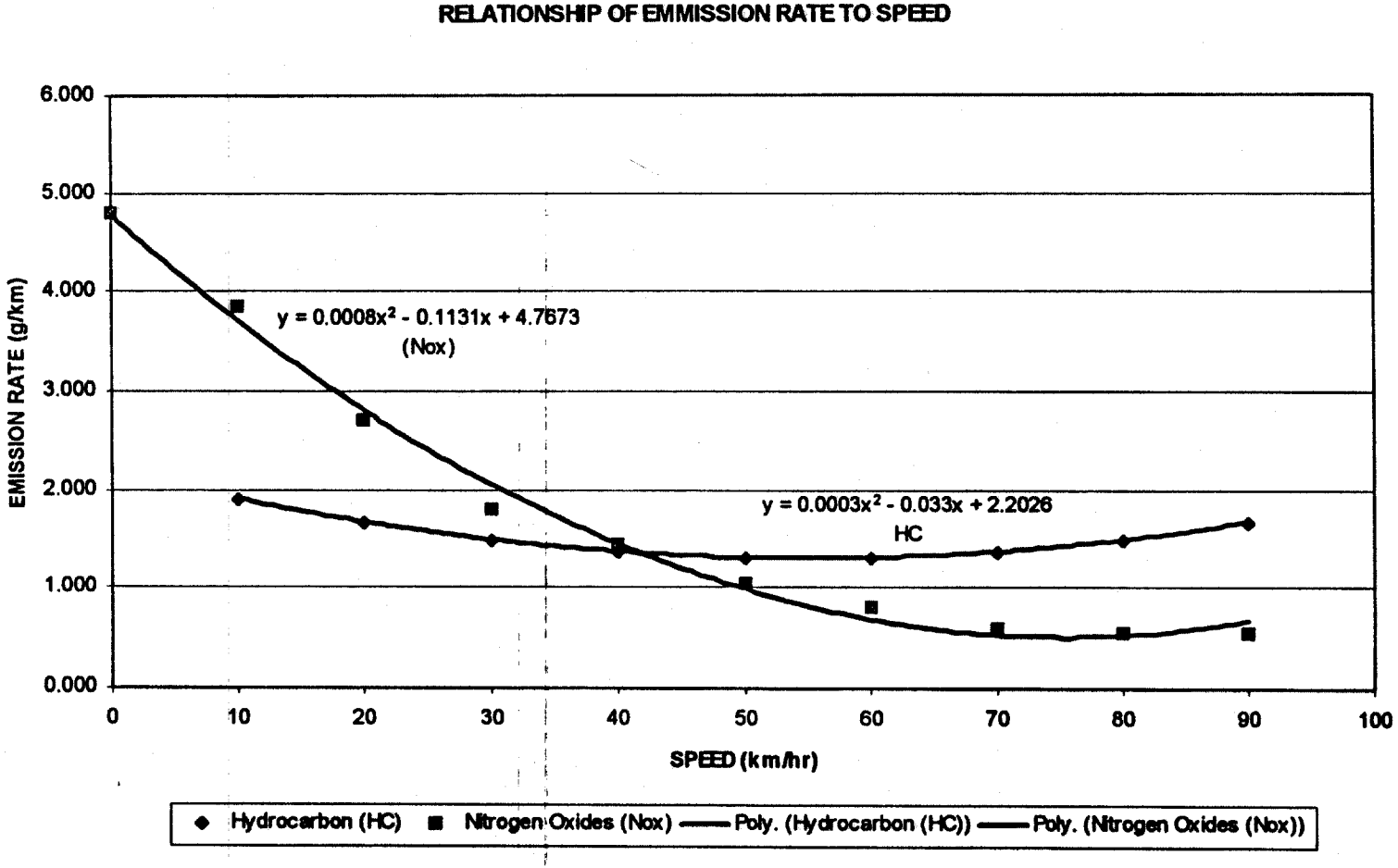
This data was applied to speed and congestion capacity calculation for the three signal Elm Street system. Using advance computer modeling we have arrived at results in various ranges of pollution based on the changes in congestion throughout the day and based on weekday and weekend scenarios.

Tables **Exhibit P Weekday On-street Parking (five days a week 52 weeks a year)** and **Exhibit Q, Weekend Parking Only (two days a week 52 weeks a year),** outlines the way the differences in gasoline costs and pollution was calculated for the various scenarios. The analysis also included additional costs for lost time associated with the congestion. The data was calculated for various LOS's and based on these and other data produced under the previous analysis, environmental and monetary costs were arrived at.

Exhibits R and S, Summary Annual Costs tabulates the differences between the scenarios and the existing situation. This data was further altered by including the removal of trucks, and a 10% reduction in traffic. This was based on an assumption from some Committee members that some traffic would be eliminated. The comparison to the existing traffic delay cost was produced as **Exhibit T, Annual Increase in Costs, Elm Street.**

This comparison indicates that the proposals could increase the monetary cost to drivers of up to **$1,005,290.00** in time and **$39,598.00** in fuel. From an environmental perspective there could be an additional **894 kg/year** of nitrogen oxides **(NOx)** and **248 kg/year** of hydrocarbons **(HC)** in pollution added to the environment. We have attached for the information of the Committee, a description of the effects of NOx and carbon monoxide **(Co)**, to both health and the environment **(see Exhibit U).**

EXHIBIT O


RELATIONSHIP OF EMMISSION RATE TO SPEED
EMISSION RATE (g/km)
6.000
5.000
4.000
3.000
2.000
1.000
0.000
y = 0.0008x² - 0.1131x + 4.7673
(Nox)
y = 0.0003x² - 0.033x + 2.2026
HC
0
10
20
30
40
50
60
70
80
90
100
SPEED (km/hr)
Hydrocarbon (HC)
Nitrogen Oxides (Nox)
Poly. (Hydrocarbon (HC))
Poly. (Nitrogen Oxides (Nox))

The following are the graphical comparisons that continue the previous congestion calculations by looking at the all three scenarios and the existing scenarios with the hoped for reductions.

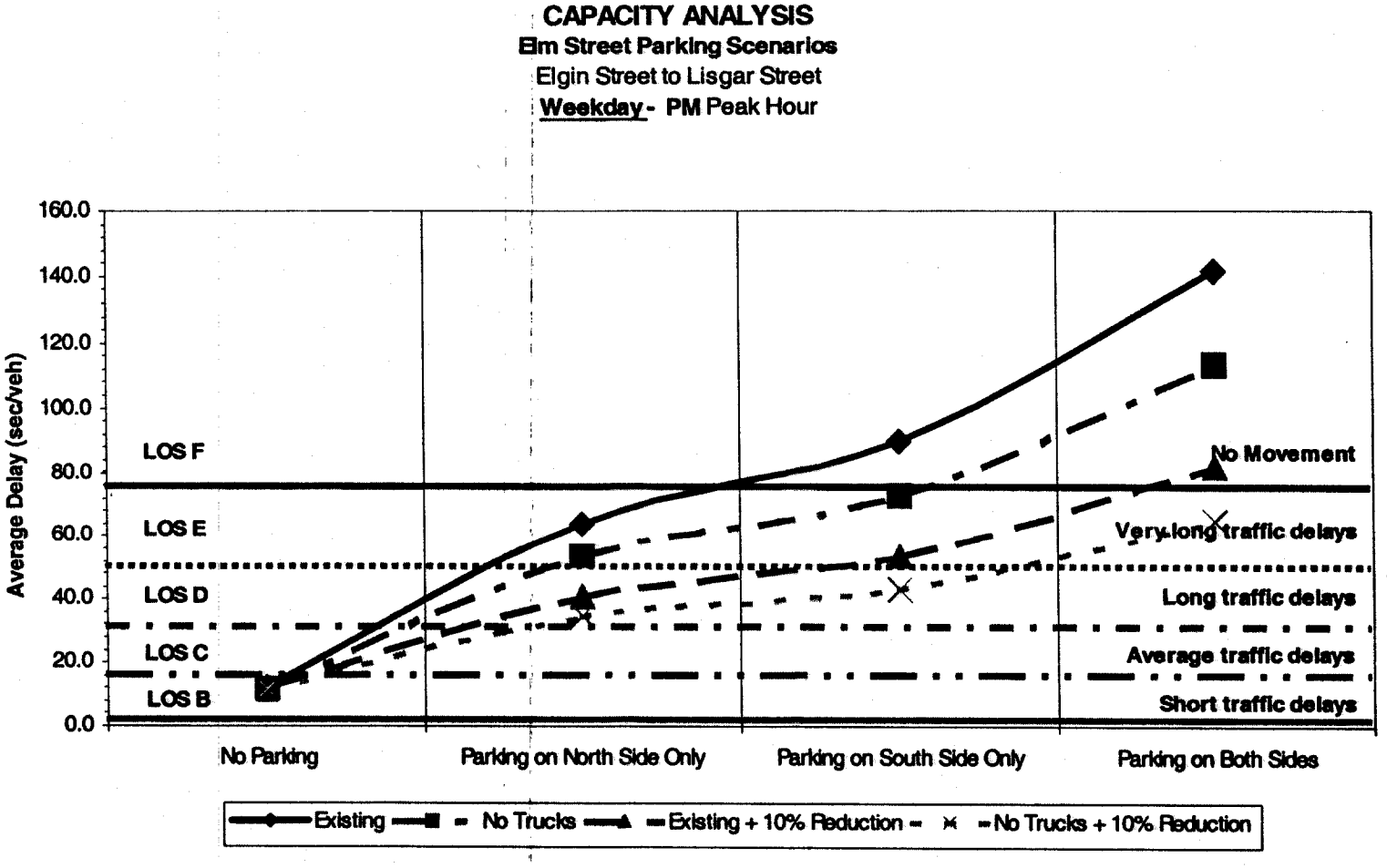


EXHIBIT P

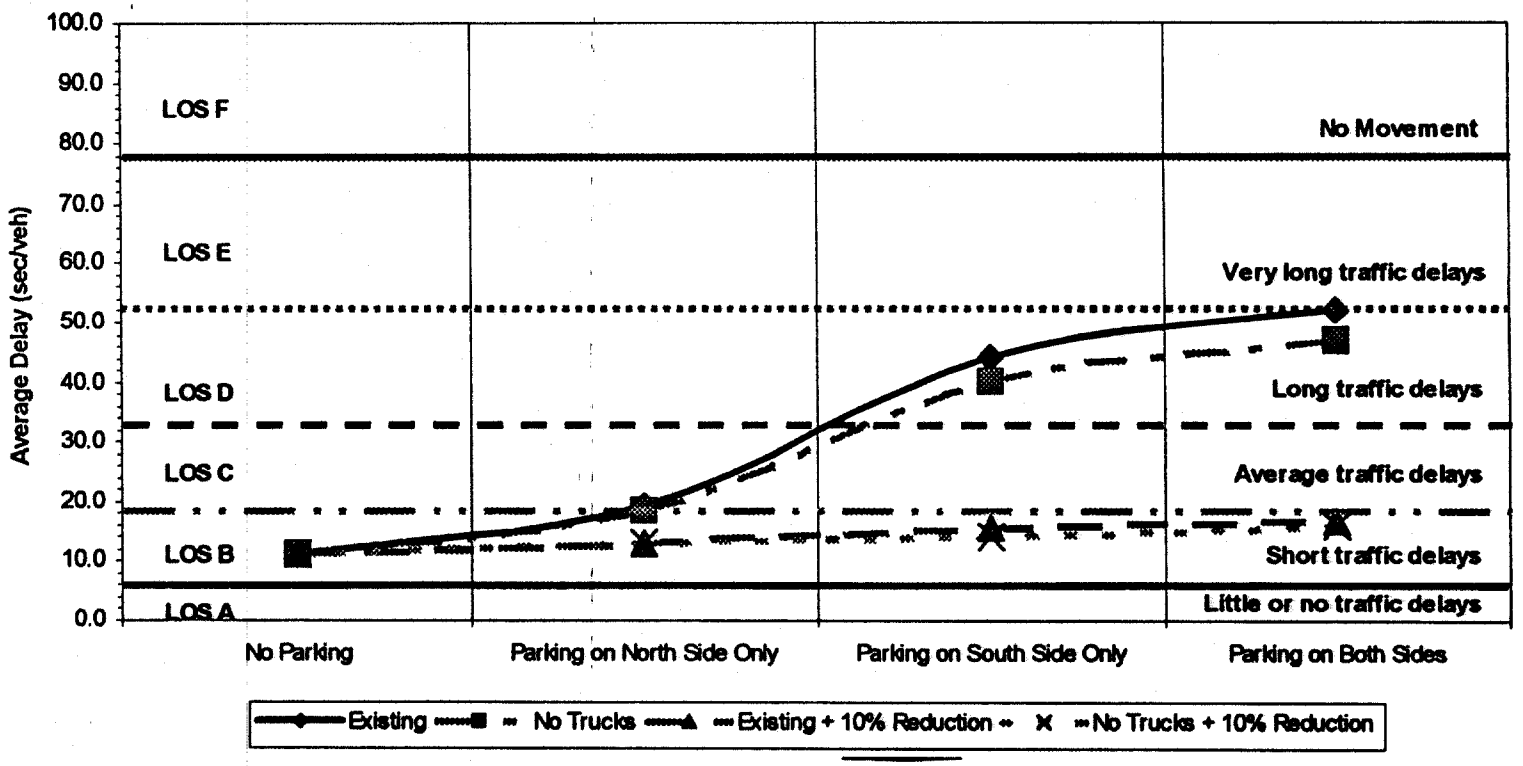
EXHIBIT Q

CAPACITY ANALYSIS

On-Street Parking Scenarios on Elm Street

Elgin Street to Lisgar Street

Weekend - PM Peak Hour



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The above data for **weekdays** shows that with any of the three options, parking north side, parking south side, and parking both sides, there will still be a substantial reduction in vehicular capacity along Elm Street. The least disruptive scenario would be parking along the north side only, along with the removal of all trucks and a corresponding reduction of 10% of the traffic. This would still create long traffic delays along this three signal corridor.

Again, the issue of compounding these delays with the disruption that presently occurs due the closure of Elm Street by railroad activity must be considered. The result will see queuing for longer periods of time that can extend as far as the Lorne Street intersection. The reality of this still depends on a 10% reduction and the removal of all truck traffic.

The following is a graphical comparison of the delays felt as a result of the proposed parking during the weekend only.

CAPACITY ANALYSIS - ON-STREET PARKING SCENARIOS ALONG ELM STREET

WEEKDAY - ELGIN STREET TO LISGAR STREET

Scenarios	LOS	Duration (hr)	Av. Delays (Sec/veh)	Travel Time (sec)	Speed (km/hr)	Time Spending ($/year)*	Fuel Consumption ($/year)**	NOX (kg/year)	HC (kg/year)
Existing	*B*	*24*	*12.4*	*90*	*32*	*1,404,000*	*70,278*	*2455*	*1830*
Parking on West Side	B	10	12.4	90	32	585,000	29,282	1023	763
	C	2	33	110	26	143,130	6,874	246	162
	D	2.5	52	130	23	210,600	9,558	346	212
	E	6.5	78	156	19	657,410	27,429	1002	578
	F	3	82	160	18	311,220	12,815	469	268
Σ		**24**				**1,907,360**	**85,959**	**3085**	**1983**
Δ						***503,360***	***15,681***	***631***	***153***
Parking on East Side	B	10	12.4	*90*	32	585,000	29,282	1023	763
	C	2	32.5	110	29	143,130	6,874	246	162
	D	2	52.0	130	26	168,480	7,646	277	170
	E	3.5	78.0	156	22	353,990	14,770	540	311
	F	6.5	97.0	175	17	737,685	28,913	1061	594
Σ		**24**				**1,988,285**	**87,485**	**3146**	**1999**
Δ						***584,285***	***17,208***	***692***	***169***
Parking on Both Sides	B	10.5	12.4	90	32	614,250	30,746	1074	801
	C	1	32.5	110	27	71,565	3,437	123	81
	D	1.5	52.0	130	26	126,360	5,735	208	127
	E	1	78.0	156	21	101,140	4,220	154	89
	F	10	141.7	219	13	1,425,450	48,496	1793	957
Σ		**24**				**2,338,765**	**92,635**	**3351**	**2055**
Δ						***934,765***	***22,357***	***896***	***224***

* Occupancy = 1.2 @ $10/hr

** Fuel @ 70 cents/litre

EXHIBIT R

IMPACT ANALYSIS OF VARIOUS PARKING SCENARIOS ON ELM STREET TRAFFIC

Elm Street Capacity Analysis - Various Parking Scemarios
Weekend

Scenarios	LOS	Duration (hr)	Av. Delays (Sec/veh)	Travel Time (sec)	Speed (km/hr)	Time ($/year)*	Fuel Consumption ($/year)**	NOX (kg/year)	HC (kg/year)
Existing	B	24	12.4	85	34	294,667	14,831	514	400
Parking on North Side	B	19.5	12.4	85	34	239,417	12,050	417	325
	C	4.5	32.5	110	26	71,565	3,437	123	81
Σ		*24*				*310,982*	*15,487*	*540*	*406*
Δ						***16,315***	***656***	***27***	***6***
Parking on South Side	B	19.5	12.4	85	34	239,417	12,050	417	325
	C	1	32.5	110	26	15,903	764	27	18
	D	3.5	52	130	23	65,520	2,974	108	66
Σ		*24*				*320,840*	*15,788*	*552*	*409*
Δ						***26,173***	***957***	***39***	***9***
Parking on Both Sides	B	14	12.4	85	34	171,889	8,651	300	233
	C	2.5	32.5	110	26	39,758	1,909	68	45
	D	4	52	130	23	74,880	3,398	123	75
	E	3.5	78	156	19	78,664	3,282	120	69
Σ		24				365,192	17,241	611	423
Δ						***70,525***	***2,410***	***97***	***23***

* Occupancy = 1.2 @ $10/hr
** Fuel @ 70 cents/litre

EXHIBIT S

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SUMMARY
STREET PARKING SCENARIOS ALONG ELM STREET
ANNUAL COSTS

Scenarios	Time ($/year)*	Fuel Consumption ($/year)**	NOX (kg/year)	HC (kg/year)
Existing	1,698,667	70,278	2,968	2,230
Parking on North Side	2,218,342	101,446	3,625	2,389
Parking on South Side	2,309,125	103,273	3,698	2,408
Parking on Both Sides	2,703,957	109,876	3,962	2,477
Parking West Side + 10% Reduction	1,848,600	92,036	3,157	2,271
Parking East Side + 10% Reduction	2,042,040	93,076	3,275	2,302
Parking Both Sides + 10% Reduction	2,489,760	95,103	3,771	2,436

Annual Increase in Costs, Elm Street

Comparison - Various Parking Scenarios to Existing Condition

Scenarios	Time ($/year)*	Fuel Consumption ($/year)**	NOX (kg/year)	HC (kg/year)
Parking on North Side	519,675	31,168	657	159
Parking on South Side	610,458	32,995	730	178
Parking on Both Sides	1,005,290	39,598	994	248
Parking West Side + 10% Reduction	149,933	21,758	189	41
Parking East Side + 10% Reduction	343,373	22,798	307	72
Parking Both Sides + 10% Reduction	791,093	24,826	802	206

* Occupancy = 1.2 @ $10/hr
** Fuel @ 70 cents/litre

EXHIBIT T

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CARS AND POLLUTION

The American Lung Association Web Site
http://www.lungusa.org/air/envcarcare.html

Transportation sources contribute more than half the total amount of man-made air pollution in the United States today. Motor vehicle emissions account for approximately 77 percent of the carbon monoxide (CO), more than 35.6 percent of the volatile organic compounds (including hydrocarbons) and forty five percent of the nitrogen oxides (NOx) in our nation's air.

Carbon monoxide emissions are a result of incomplete fuel combustion. CO is a colorless, odorless gas which limits the blood's ability to transport oxygen to body tissues. This places a strain on people with weak hearts and respiratory diseases, the elderly, and pregnant women. High levels of CO can also cause dizziness, headaches, impaired coordination and, at very high levels, even death.

Nitrogen oxides are the result of high temperature combustion. These pollutants can damage lung tissue and aggravate chronic lung diseases such as asthma. In addition, NOx can lower the body's resistance to respiratory infection.

Volatile organic compounds (including hydrocarbons) are another product of incomplete combustion, and when exposed to sunlight are involved in the chemical reactions which lead to the formation of ozone.

Ozone, a major component of smog, is a strong irritant to the eye and respiratory tract. Like NOx, ozone can cause increased respiratory problems for people with asthma and other respiratory diseases.

EXHIBIT U

In this representation parking on both sides is still very disruptive with or without truck traffic. Should there be a total weekend prohibition of truck traffic along with a 10% reduction of vehicular traffic, the congestion would remain at LOS "B" or better.

Attachments

Elm St. Traffic Report

Prepared for

The Region of Sudbury

December 2000

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TABLE OF CONTENTS

1. OBJECTIVE

The following represents the results of an omnibus public opinion survey of voting age residents of the Region of Sudbury. Included in this report are questions subscribed to by the Region of Sudbury related to attitudes towards traffic and parking on Elm Street in Sudbury.

A total of 400 residents of the Region of Sudbury, 18 years of age and older, were contacted in this survey. Interviews were conducted between November 13th and November 17th 2000.

2. METHODOLOGY AND LOGISTICS

Study Sample

- A total of 400 respondents 18 years of age and older were interviewed in the survey from across the Region of Sudbury.

Survey Method

- The survey was conducted using computer-assisted techniques of telephone interviewing (CATI) and random number selection. No pre-imposed demographic quotas were set, as the survey method ensured a representative sample of the general population of the Region of Sudbury.
- The study sample was drawn using a modified method of "Random Digit Dialing" (Mitofsky-Waksberg).
- A total of 30% of all interviews were monitored and the management of Oraclepoll Research supervised 100% of calls.

Logistics

- The survey was conducted between November 13th and November 17th 2000.
- Initial calls were made from 5:30 p.m. to 9:30 p.m. with call-backs of no-answers and busy numbers made on a (staggered) daily rotating basis up to 5 times (from 10:00 a.m. to 9:30 p.m.) until contact was made. In addition, telephone interview appointments were attempted with those respondents unable to complete the survey at the time of contact.

Confidence

- The margin of error for a survey of this nature is ± 4.9%, 19/20 times

3. EXECUTIVE SUMMARY

Among respondents who had an opinion about the most important issue facing their community, the top three concerns were jobs (14%), health care (13%), and roads (12%). Issues of amalgamation (8%), taxes (7%), and the state of downtown (4%) were the next most common concerns.

In a full seven-day week, 19% of respondents travel along Elm Street five times a week or more, 29% use it four times or less and 51% use Elm Street once a week or less. Of the 51% who said they do not travel weekly on Elm Street, 33% claim not to use Elm Street at all.

The method of transportation most frequently used on Elm Street is the car (89%). 5% of respondents most frequently travel by foot, and 4% by public transit.

Reaction to the proposal to reduce the number of lanes on Elm Street was not favorable, with 50% stating that Elm Street should be left as it is. Only 5% felt that there should be a reduction in the number of lanes on Elm Street, while 39% favored a reduction in the number of lanes on a trial basis only.

Respondents who favored the reduction in the number of lanes on Elm Street cited the need to create more parking (10%), the need to help downtown (6%), the need to attract people and shoppers (5%), and the need for Elm Street to be more pedestrian-friendly.

Respondents who favored maintaining the status quo said the reduction in the number of lanes would create congestion (13%) and that there was too much traffic on Elm Street already (9%). 6% expressed the need for a traffic flow on Elm Street, and 5% said the reduction in the number of lanes would not work or help downtown business. 4% of respondents claimed Elm Street is fine as it is, and 3% said the proposed changes were a waste of money.

If the traffic lanes on Elm Street were reduced, 61% said they would use an alternate route to avoid Elm Street, with 47% of those respondents saying they would use Regent Street and Douglas / Brady underpass, and 34% saying they would use LaSalle and Barrydowne.

If the reduction in the number of lanes on Elm Street were done on a one-month trial basis, 33% said they would be more likely to support the proposal, 16% said they would be less likely, and 46% said it would have no effect on their decision to support or oppose the proposal.

If during peak rush hour traffic periods full four-lane traffic were allowed, 44% said they would be more likely to support the proposal, 19% said they would be less likely, and 32% said it would have no effect on their support or opposition.

If metered parking were allowed along Elm Street, 26% said they would be more likely to support the proposal, 33% said they would be less likely, and 35% said it would have no effect on their decision to support or oppose the proposal.

4. RESULTS BY QUESTION

In your opinion, what is the most important issue facing your community at this time?

Don't know	19%
Jobs	14%
Health care	13%
Roads	12%
Amalgamation	8%
Taxes	7%
Downtown	4%
Education	4%
Water quality	4%
Falconbridge strike	3%
The weather	2%
Poverty / homeless	2%
Infrastructure	1%
Transit	1%
Snow removal	1%
The economy	1%
Election	1%
Crime & policing	1%
Loss of local municipal services	1%
Hospitals	1%

Q1. In an average full seven-day week, that is five weekdays, Saturday and Sunday, approximately how often do you travel along Elm Street in downtown Sudbury?

Once	14%	Go to Q3
Twice	11%	Go to Q3
Three times	2%	Go to Q3
Four times	2%	Go to Q3
Five or more	19%	Go to Q3
Don't know	1%	Go to Q3
Not weekly	51%	Go to Q2

Q2. How often would you say that you travel along Elm Street?

Once a month	25%	Go to Q3
Twice a month	20%	Go to Q3
Three times a month	2%	Go to Q3
Four times a month	4%	Go to Q3
Not monthly	12%	Go to Q3
Don't know	4%	Go to Q4
Not at all	33%	Go to Q4

Q3. What method of transportation do you most frequently use when traveling on Elm Street?

Car	89%
Foot	5%
Public transit	4%
Taxi	1%
Bicycle	1%

Q4. There is currently a proposal to reduce the number of traffic lanes on Elm Street in downtown Sudbury [between Lisgar Street and the train tracks past Elgin Street] from four lanes to two.

Those in favor of the proposal cite the need to reduce [vehicle] traffic in the area to create a pedestrian friendly area with on-Street parking in order to attract shoppers to the downtown, which may increase congestion and slow traffic. Which of the following statements most resembles your opinion on this issue?

I feel that the Elm Street should be left as it is	50%
I favor a reduction in the number of lanes on Elm from four to two on a trial basis	39%
I feel that there should be a reduction in the number of lanes from four to two on Elm	5%
Don't know	6%

Q5. Can you tell me why you feel this way?

Don't know	17%
Will create congestion	13%
Create parking	10%
Too much traffic already	9%
Need to help downtown	6%
On a trial basis	6%
Need a traffic flow	6%
Attract people / shoppers	5%
It won't help / work	5%
Fine as it is	4%
Pedestrian friendly	3%
Waste of money	3%
Don't go downtown	3%
Would mean fewer people	2%
No big trucks	2%
Need less traffic	2%
Can use other routes	1%

Dangerous	1%
Not needed	1%
Need more information	1%

Q6. If the traffic lanes on Elm Street were reduced, would you use an alternate route to get to your destination or would you continue to use Elm Street?

Alternate	61%	Go to Q7
Continue	26%	Go to Q8
Don't know	13%	Go to Q8

Q7. Which of the alternate routes would you choose?

Regent St. & Douglas / Brady underpass	47%
LaSalle & Barrydowne	34%
Beatty St. & Kathleen	7%
College & Kathleen	7%
Don't know	5%

What effect would each of the following have on your decision to support or oppose the proposed reduction of traffic lanes on Elm Street? For each area that I read, please state whether it would make you more likely to support, less likely to support, or have no effect on your decision to support or oppose the proposal.

Q8. If it were done on a one-month trial basis

More likely	33%
Less likely	16%
No effect	46%
Don't know	4%

Q9. If during peak rush hour traffic periods [8am – 9 am & 4 pm – 6 pm] full four lane traffic were allowed

More likely	44%
Less likely	19%
No effect	32%
Don't know	4%

Q10. If metered parking were allowed along Elm Street

More likely	26%
Less likely	33%
No effect	35%
Don't know	5%