

Chittenden County Regional Planning Commission

P.O. BOX 108, 58 PEARL STREET
ESSEX JUNCTION, VERMONT 05452
802 658-3004

May 11, 1976

Mr. William Wessel, Chairman
South Burlington Planning Commission
1175 Williston Road
South Burlington, Vermont 05401

Dear Bill,

In reference to your letter dated May 4, 1976 regarding site plan review for a proposed 172 unit motel-restaurant-lounge complex on the Lamplough property, attached is appropriate documentation to substantiate the points identified in our letter dated April 23, 1976 relative to proposed access to the development.

As per your request, I will attend the next scheduled meeting on this matter to answer any questions specifically related to our analysis previously submitted. I hope my attendance at your meeting will assist the South Burlington Planning Commission in their site plan review process.

Very truly yours,

BRUCE E. HOUGHTON
TRANSPORTATION ENGINEER

BEH/kss

Attachments

cc: C. Harry Behney

... Serving the Municipalities of ...

Bolton	Burlington	Charlotte	Colchester	Essex Junction	Essex Town
St. George	Hinesburg	Huntington	Jericho	Milton	Richmond
Shelburne	So. Burlington	Underhill	Westford	Williston	Winooski

EXHIBIT # 1

Dorset Street - Williston Road Intersection

Intersection Turning Movements

Intersection Volume/Capacity Analysis

CHITTENDEN COUNTY
REGIONAL PLANNING COMMISSION
URBAN TRANSPORTATION STUDY
INTERSECTION TURNING MOVEMENTS

HILLISTON ROAD (HR), DORSET ST. (DS) AND HOLIDAY INN (HI)

MAY 13, 1975

		A.M. PEAK	NOON PEAK	P.M. PEAK
HI-NE	TOTAL VOLUME	76	41	41
	% RT - TOTAL	63.2	56.1	48.8
	% LT - TOTAL	23.7	34.1	39.0
	% TRUCKS	2.6	2.4	2.4
	APPROACH			
	% ST - TRUCK	.0	.0	.0
	% RT - TRUCK	4.2	.0	.0
	% LT - TRUCK	.0	7.1	6.2
	PEDESTRIANS	1	0	0
MR-SE	TOTAL VOLUME	876	910	860
	% RT - TOTAL	1.0	1.6	3.0
	% LT - TOTAL	12.3	19.2	15.8
	% TRUCKS	5.7	2.6	2.2
	APPROACH			
	% ST - TRUCK	5.4	2.9	2.1
	% RT - TRUCK	.0	.0	.0
	% LT - TRUCK	8.3	1.7	2.9
	PEDESTRIANS	1	5	4
DS-SW	TOTAL VOLUME	334	472	572
	% RT - TOTAL	32.0	45.8	38.1
	% LT - TOTAL	64.4	51.5	60.5
	% TRUCKS	5.4	1.5	.7
	APPROACH			
	% ST - TRUCK	.0	7.7	12.5
	% RT - TRUCK	10.3	.9	.5
	% LT - TRUCK	3.3	1.6	.6
	PEDESTRIANS	1	1	1
NR-NW	TOTAL VOLUME	770	1047	1251
	% RT - TOTAL	34.4	38.0	27.3
	% LT - TOTAL	3.0	3.8	3.5
	% TRUCKS	5.1	2.3	3.7
	APPROACH			
	% ST - TRUCK	5.2	1.9	3.4
	% RT - TRUCK	4.9	3.2	4.7
	% LT - TRUCK	4.3	2.5	2.3
	PEDESTRIANS	3	0	2

A.M. PEAK 7:30 A.M. TO 9:30 A.M.
NOON PEAK 12:00 NOON TO 1:00 P.M.
P.M. PEAK 4:15 P.M. TO 5:15 P.M.

CHITTENDEN COUNTY
REGIONAL PLANNING COMMISSION
URBAN TRANSPORTATION STUDY
INTERSECTION TURNING MOVEMENTS

MILLISTON ROAD (WR), DORSET ST. (DS) AND HOLIDAY INN (HI)

MAY 13, 1975

		A.M. PERIOD	NOON PERIOD	P.M. PERIOD	TOTAL COUNT
HI-NE APPROACH	TOTAL VOLUME	144	86	121	351
	% RT - TOTAL	60.4	54.7	55.4	57.3
	% LT - TOTAL	22.2	32.6	29.8	27.4
	% TRUCKS	1.4	1.2	1.7	1.4
	% ST - TRUCK	.0	.0	.0	.0
	% RT - TRUCK	2.3	.0	1.5	1.5
	% LT - TRUCK	.0	3.6	2.8	2.1
PEDESTRIANS	3	0	1	4	
WR-SE APPROACH	TOTAL VOLUME	1834	1609	2336	5779
	% RT - TOTAL	1.0	1.9	2.6	1.9
	% LT - TOTAL	14.2	20.1	17.0	16.9
	% TRUCKS	7.3	3.6	2.5	4.3
	% ST - TRUCK	6.8	3.9	2.6	4.3
	% RT - TRUCK	10.5	.0	.0	1.8
	% LT - TRUCK	10.0	2.3	2.5	4.6
PEDESTRIANS	5	5	7	17	
DS-SW APPROACH	TOTAL VOLUME	723	962	1541	3226
	% RT - TOTAL	33.7	45.0	36.4	38.4
	% LT - TOTAL	63.2	53.3	62.4	59.9
	% TRUCKS	7.2	1.9	1.3	2.8
	% ST - TRUCK	.0	6.2	5.6	3.6
	% RT - TRUCK	13.9	2.3	2.0	4.4
	% LT - TRUCK	3.9	1.4	.8	1.7
PEDESTRIANS	3	1	1	5	
WR-NW APPROACH	TOTAL VOLUME	1602	1941	3402	6945
	% RT - TOTAL	33.6	29.0	27.0	29.4
	% LT - TOTAL	2.8	3.4	3.4	3.3
	% TRUCKS	5.6	3.2	3.5	3.9
	% ST - TRUCK	6.0	3.0	3.4	3.9
	% RT - TRUCK	5.2	3.7	3.9	4.2
	% LT - TRUCK	2.2	1.5	1.7	1.8
PEDESTRIANS	5	4	8	17	
	A.M. PERIOD	7:00 A.M. TO 9:30 A.M.			
	NOON PERIOD	11:00 A.M. TO 1:00 P.M.			
	P.M. PERIOD	3:00 P.M. TO 6:00 P.M.			

CHITTENDEN COUNTY
REGIONAL PLANNING COMMISSION
URBAN TRANSPORTATION STUDY

INTERSECTION VOLUME/CAPACITY ANALYSIS

SOUTH BURLINGTON, VERMONT
WILLISTON ROAD & DORSET STREET P.M.

JANUARY 28, 1976

APPROACH : WILLISTON ROAD - SOUTHEAST (EXISTING)

APPROACH TYPE : URBAN; TWO WAY STREET
WITH PARKING PROHIBITED ; NEAR-SIDE BUS STOP
NO RIGHT TURN LANE; NO LEFT TURN LANE

CAPACITY ANALYSIS WITH LOAD FACTOR OF .85

APPROACH WIDTH = 22.0 FT BASIC CAP = 1833. VEH/(HR GR)

CYCLE(C) = 100.0 SEC. GREEN(G) = 55.0 SEC. G/C = .550

INTERSECTION CHARACTERISTIC	ADJUSTMENT FACTOR
POPULATION & PEAK HOUR FACTOR(75.%)	1.027
LOCATION IN TOWN	1.000
RIGHT TURNS (3.000%)	1.035
LEFT TURNS (15.000%)	.941
TRUCKS (2.200%)	1.028
CURB USE AT INTERSECTION	.990
LOCAL ADJUSTMENT FACTOR	1.000

COMBINED ADJUSTMENT FACTOR = 1.018

PEAK-HOUR VOL = 860. VEH/HR CAPACITY = 1026. VEH/HR

VOLUME/CAPACITY RATIO = .838 SERVICE LEVEL = D

**SERVICE LEVEL	*	TRAFFIC CONDITION	*	V/C RATIO	**
** A	*	FREE FLOW	*	0.00-0.59	**
** B	*	STABLE FLOW	*	0.60-0.69	**
** C	*	STABLE FLOW	*	0.70-0.79	**
** D	*	APPRO. UNSTABLE	*	0.80-0.89	**
** E	*	UNSTABLE FLOW	*	0.90-1.00	**
** F	*	FORCED FLOW	*	-	**

CHITTENDEN COUNTY
 REGIONAL PLANNING COMMISSION
 URBAN TRANSPORTATION STUDY

INTERSECTION VOLUME/CAPACITY ANALYSIS

SOUTH BURLINGTON, VERMONT
 MILLISTON ROAD & DORSET STREET P.M.

JANUARY 28, 1976

APPROACH : MILLISTON ROAD - NORTHWEST (EXISTING)

APPROACH TYPE : URBAN; TWO WAY STREET
 WITH PARKING PROHIBITED ; FAR SIDE BUS STOP
 NO RIGHT TURN LANE; NO LEFT TURN LANE

CAPACITY ANALYSIS WITH LOAD FACTOR OF .85

APPROACH WIDTH = 26.0 FT BASIC CAP = 2180. VEH/(HR GR)

CYCLE(C) = 100.0 SEC. GREEN(G) = 55.0 SEC. G/C = .550

INTERSECTION CHARACTERISTIC	ADJUSTMENT FACTOR
POPULATION & PEAK HOUR FACTOR(75.81.00)	1.027
LOCATION IN TOWN	1.000
RIGHT TURNS (27.300%)	.993
LEFT TURNS (3.500%)	1.064
TRUCKS (3.700%)	1.013
CURB USE AT INTERSECTION	1.000
LOCAL ADJUSTMENT FACTOR	1.000

COMBINED ADJUSTMENT FACTOR = 1.099

PEAK-HOUR VOL = 1251. VEH/HR CAPACITY = 1318. VEH/HR

VOLUME/CAPACITY RATIO = .949 SERVICE LEVEL = E

SERVICE LEVEL	TRAFFIC CONDITION	U/C RATIO
A	FREE FLOW	0.00-0.59
B	STABLE FLOW	0.60-0.69
C	STABLE FLOW	0.70-0.79
D	APPRO. UNSTABLE	0.80-0.89
E	UNSTABLE FLOW	0.90-1.00
F	FORCED FLOW	-

Alternative # 1

CHITTENDEN COUNTY
REGIONAL PLANNING COMMISSION
URBAN TRANSPORTATION STUDY

INTERSECTION VOLUME/CAPACITY ANALYSIS

SOUTH BURLINGTON, VERMONT
WILLISTON ROAD & DORSET STREET P.M.

JANUARY 28, 1976

APPROACH : DORSET STREET - SOUTHWEST (EXISTING)

APPROACH TYPE : URBAN; TWO WAY STREET
WITH PARKING PROHIBITED ; NO BUS STOP
NO RIGHT TURN LANE; NO LEFT TURN LANE

CAPACITY ANALYSIS WITH LOAD FACTOR OF .85

APPROACH WIDTH = 20.0 FT BASIC CAP = 1660. VEH/(HR GR)

CYCLE(C) = 100.0 SEC. GREEN(G) = 29.0 SEC. G/C = .290

INTERSECTION CHARACTERISTIC	ADJUSTMENT FACTOR
POPULATION & PEAK HOUR FACTOR(.75 & .70)	.818
LOCATION IN TOWN	1.000
RIGHT TURNS (30.000%)	.900
LEFT TURNS (30.000%)	.850
TRUCKS (.700%)	1.043
CURB USE AT INTERSECTION	1.000
LOCAL ADJUSTMENT FACTOR	1.900

COMBINED ADJUSTMENT FACTOR = 1.241

PEAK-HOUR VOL = 572. VEH/HR CAPACITY = 597. VEH/HR

VOLUME/CAPACITY RATIO = .957 SERVICE LEVEL = E

SERVICE LEVEL	TRAFFIC CONDITION	U/C RATIO
A	FREE FLOW	0.00-0.59
B	STABLE FLOW	0.60-0.69
C	STABLE FLOW	0.70-0.79
D	APPRO. UNSTABLE	0.80-0.89
E	UNSTABLE FLOW	0.90-1.00
F	FORCED FLOW	-

Alternative # 2

Chittenden County
Regional Planning Commission
Urban Transportation Study

Intersection Volume/Capacity Analysis

South Burlington, Vermont
Williston Road & Dorset Street P.M.

January 28, 1976

Approach: Dorset Street - Southwest (Existing)

Capacity Analysis:

Left Turn Cap. = $[(1200)(0.29) - (41/1.026)](1.043) = 320$ vehicles/hour.

Right Turn Cap. = $(1200)(0.29)(1.043) = 363$ vehicles/hour.

Total Cap. = 683 vehicles/hour

Volume/Capacity Ratio = 0.838

Level of Service = D

EXHIBIT # 2

Estimated Trips Entering Facility During P.M. Peak Hour of Street Operation

Total Entering Trips = 110 Vehicles/hour

Left-Turn Entering Trips = 78 Vehicles/hour (70%)

Right-Turn Entering Trips = 32 Vehicles/hour (30%)

Source: Guidelines for Driveway Design and Location
Institute of Transportation (Traffic) Engineers 1975

Observed Trips Entering the Holiday Inn (May 13, 1975)

4:15 P.M. - 5:15 P.M.

Right-Turn Entering Trips = 26 Vehicles/hour

Left-Turn Entering Trips = 44 Vehicles/hour

Straight-Thru Entering Trips = 8 Vehicles/hour

Total Entering Trips = 78 Vehicles/hour.

Maximum Observed Trips Entering = 93 Vehicles/hour 5:30 P.M. - 6:30 P.M.

EXHIBIT # 3

Theoretical Capacity Analysis For Vehicles To Cross Williston Road

Observed Time Gap Distribution on Williston Road

Observed Westbound Traffic Queues at Two Locations on Williston Road

Assumption For Capacity Analysis

1. Left turn vehicles have a separate lane.
2. There is a constant queue of vehicles waiting to turn left.
3. Time gaps in the opposing flow of traffic are distributed exponentially.
4. Average acceptable gaps used in the analysis have a 0.5 probability.

Source of gap acceptance information:

Olin K. Dart, Jr.
Highway Research Record No. 230
Pg. 45-59

?
OPPOSING VOL (UPH) = 700.000
AVG ACCEPTABLE GAP (SECONDS) = 4.50000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 132.048

?
OPPOSING VOL (UPH) = 800.000
AVG ACCEPTABLE GAP (SECONDS) = 4.50000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 120.967

?
OPPOSING VOL (UPH) = 900.000
AVG ACCEPTABLE GAP (SECONDS) = 4.50000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 110.754

?
OPPOSING VOL (UPH) = 1000.00
AVG ACCEPTABLE GAP (SECONDS) = 4.50000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 101.346

?
OPPOSING VOL (UPH) = 700.000
AVG ACCEPTABLE GAP (SECONDS) = 5.20000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 115.244

?
OPPOSING VOL (UPH) = 800.000
AVG ACCEPTABLE GAP (SECONDS) = 5.20000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 103.541

?u
OPPOSING VOL (UPH) = 900.000
AVG ACCEPTABLE GAP (SECONDS) = 5.20000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 92.9731

?
OPPOSING VOL (UPH) = 1000.00
AVG ACCEPTABLE GAP (SECONDS) = 5.20000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 83.4370

OPPOSING VOL (UPH) = 700.000
AVG ACCEPTABLE GAP (SECONDS) = 5.50000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 108.714

OPPOSING VOL (UPH) = 800.000
AVG ACCEPTABLE GAP (SECONDS) = 5.50000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 96.8632

OPPOSING VOL (UPH) = 900.000
AVG ACCEPTABLE GAP (SECONDS) = 5.50000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 86.2552

OPPOSING VOL (UPH) = 1000.00
AVG ACCEPTABLE GAP (SECONDS) = 5.50000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 76.7658

?
OPPOSING VOL (UPH) = 700.000
AVG ACCEPTABLE GAP (SECONDS) = 5.80000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 102.554

?
OPPOSING VOL (UPH) = 800.000
AVG ACCEPTABLE GAP (SECONDS) = 5.80000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 90.6162

?
OPPOSING VOL (UPH) = 900.000
AVG ACCEPTABLE GAP (SECONDS) = 5.80000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 80.0227

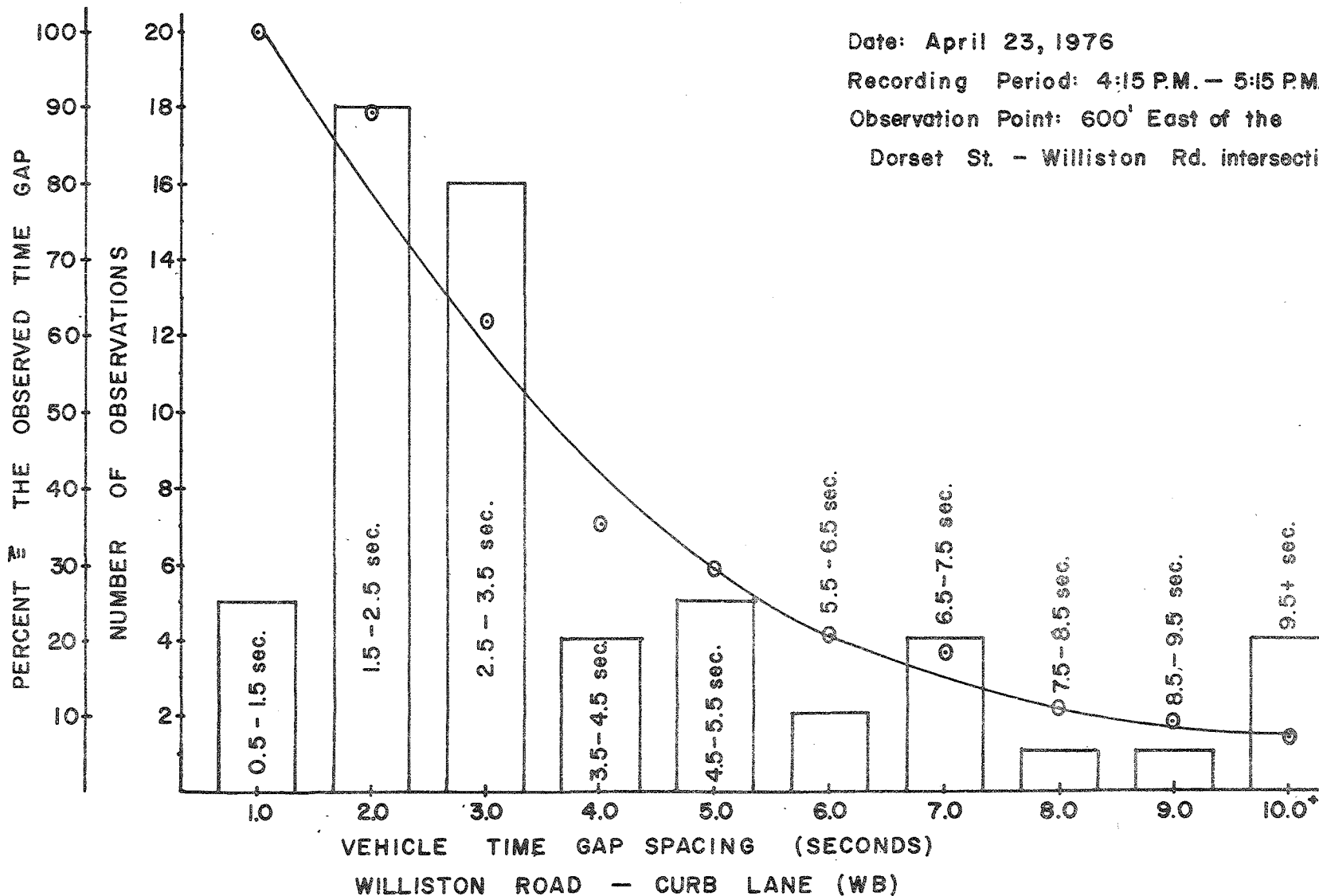
?
OPPOSING VOL (UPH) = 1000.00
AVG ACCEPTABLE GAP (SECONDS) = 5.80000
AVG FOLLOWING HEADWAY (SECONDS) = 3.00000
PORTION OF TIME TURN IS NOT BLOCKED = .200000
LEFT TURN CAPACITY (UPH) = 70.6279

DISTRIBUTION OF OBSERVED TIME GAPS
 LIMITED SAMPLE SIZE - 60 OBSERVATIONS

Date: April 23, 1976

Recording Period: 4:15 P.M. - 5:15 P.M.

Observation Point: 600' East of the
 Dorset St. - Williston Rd. intersection

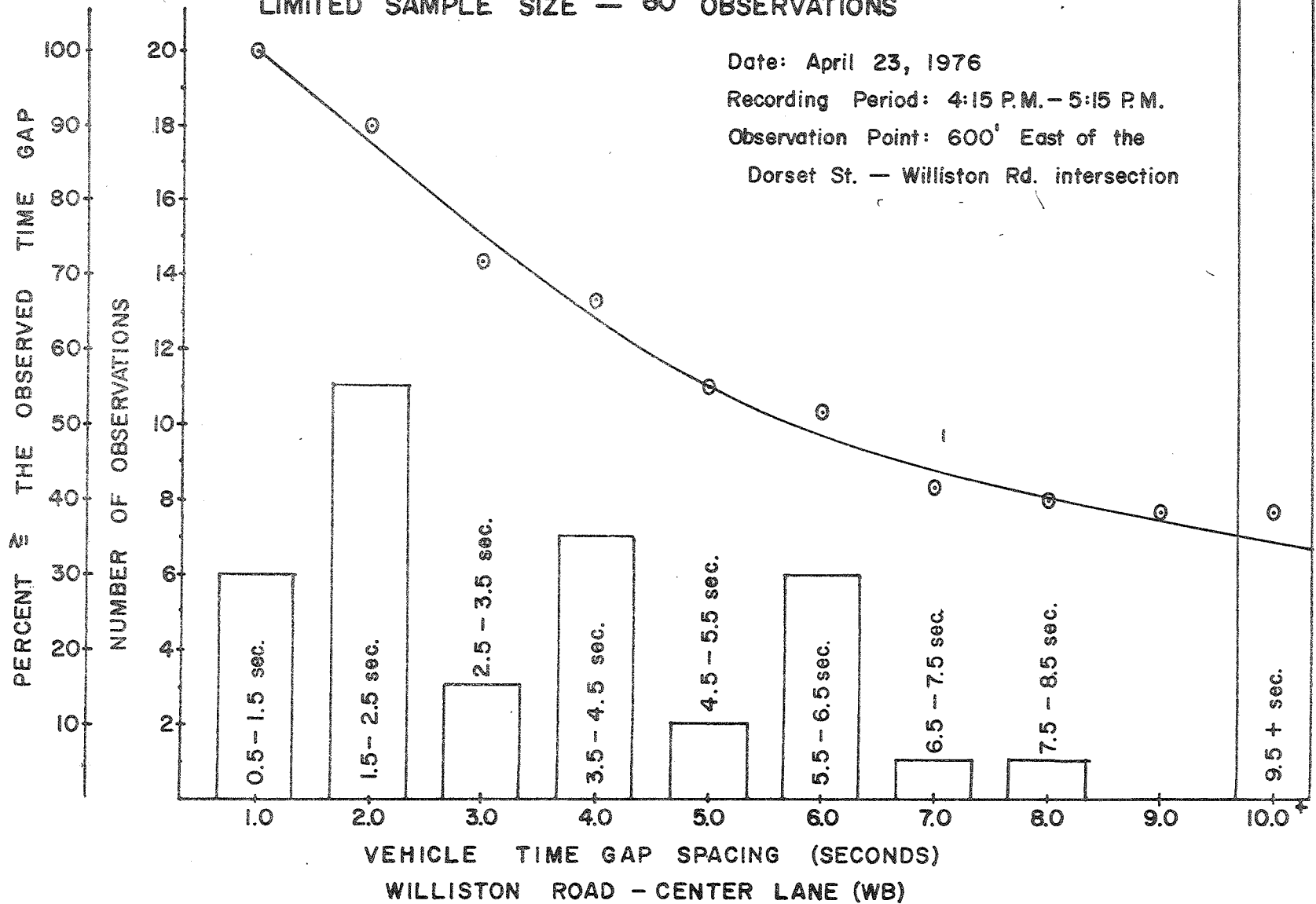


DISTRIBUTION OF OBSERVED TIME GAPS
 LIMITED SAMPLE SIZE — 60 OBSERVATIONS

Date: April 23, 1976

Recording Period: 4:15 P.M. — 5:15 P.M.

Observation Point: 600' East of the
 Dorset St. — Williston Rd. intersection



OBSERVED WESTBOUND TRAFFIC QUEUES AT TWO LOCATIONS ON
WILLISTON ROAD

Date: April 23, 1976

Study Period: 4:15 P.M. to 5:15 P.M.

Recording Interval: 100 seconds (one light cycle)

Observation Points	Curb Lane	Center Lane
280 ft. east of Dorset Street	32	4
730 ft. east of Dorset Street	2	0
Total Observations	= 40	