BELLAMY ROAD ORIGIN/DESTINATION SURVEY ANALYSIS

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BELLAMY ROAD ORIGIN/DESTINATION SURVEY ANALYSIS

STUDY OBJECTIVE

An Origin-Destination Traffic Study of the Bellamy Road area was conducted by the City of Dover Planning Department with the aid of staff from the Strafford Regional Planning Commission in December, 1990. Figure 1 depicts the study area. The objective of the study is to determine the percent of Bellamy Road traffic that is local to the road and the percent from outside of the local residential area; to determine why Bellamy Road is being used by pass-through traffic; and to determine alternate routes that the vehicles travelling Bellamy Road would use should the road be closed to through travel, as this idea has been advanced to mitigate the perceived problems of volume and speed.

To assess impact on alternate routes of diverting traffic, the study will compute the projected assignment of the displaced traffic and load it onto the identified alternate routes. Key intersections on the alternate routes will be analyzed for levels of service (LOS) before and after loading the displaced volumes. A comparison of the levels of service, vehicle delay times, and reserve capacity results will reveal whether closing the Bellamy Road will be recommended.

TRAFFIC LEVEL OF SERVICE DEFINITIONS

Level of service (LOS) is a qualitative measure describing driver satisfaction with a number of factors influencing the degree of traffic congestion. These factors include speed and travel time, traffic interruption, freedom to maneuver, safety, driving comfort and convenience, and delays. There are six levels of service describing traffic flow. The highest is LOS A, describing a free-flowing condition. The lowest, LOS F, is described as forced flow, and is characterized by traffic volumes at the roadway capacity and extreme congestion.

LOS C, which is normally utilized for design purposes, describes a stable condition of traffic operation. It has a somewhat restricted movement due to higher traffic volumes, but flow conditions are not objectionable for motorists.

LOS D, which is acceptable for traffic operations in urban environments and during peak hours of traffic flow, reflects a more restricted movement for motorists. Queues and delays may occur during short peaks, but lower demands occur often enough to permit clearance of developing queues, thus,

preventing excessive backups. LOS E is defined as the actual capacity of the roadway and involves delay to all motorists due to congestion. Levels of Service E and F are generally considered unacceptable.

Level of service is defined separately for both signalized and unsignalized intersections. Level of service for signalized intersections is defined in terms of average delay per vehicle entering the intersection. Delay is considered a measure of driver discomfort, frustration, fuel consumption and travel time. Table A summarizes the criteria for signalized intersection level of service.

Level of service for unsignalized intersections is based on the number of acceptable gaps available in a main street traffic flow that may be utilized by minor street vehicles. The criteria shown in Table B are based on the available reserve capacity for the minor street movement, and the delay to the minor street traffic.

Reserve capacity is defined as capacity in excess of demand of a lane or an approach, and is calculated by subtracting the actual traffic volume from the hourly capacity through the intersection.

EXISTING TRAFFIC VOLUMES

A comprehensive traffic count was performed by SRPC in May 1990, on Bellamy Road, which showed that the average daily traffic volume in a 72-hour period was 3,281 vehicles per day. The northbound traffic totaled 1,646, while the southbound traffic totaled 1,635, a 50/50 northbound/southbound split. The even split of northbound and southbound traffic on Bellamy Road holds up during the average peak hour where 179 cars traveled northbound and 177 cars traveled southbound. The 50/50 split is especially important when assigning traffic to alternative routes from the northbound and southbound directions.

STUDY BACKGROUND

On Thursday December 6, 1990, during the AM Peak Hour, the PM Peak Hour and the noon hour a northbound and southbound survey station was located on Bellamy Road adjacent to the High School athletic fields. Northbound and southbound vehicles were stopped in a "bay space as available" manner during those hours. 360 "good data" vehicles were surveyed through the station. This represents 11% of the average daily traffic on Bellamy Road. As each vehicle had both an origin and a destination, data on 720 individual origin and destination points was gathered. Data on the purpose, frequency and time of each trip also was gathered. Data regarding the street network traveled before and after Bellamy Road by each vehicle was compiled as well.

The origin/destination data from the stopped vehicles was compiled into northbound and southbound alphabetical primary and secondary sorts in a spreadsheet format. The spreadsheet sorts may be found in the spreadsheet section of this report.

STUDY METHODOLOGY AND FINDINGS

The origin/destination data points were then plotted graphically and connected to reveal the desire-lines of the Bellamy Road traffic. A desire-line is simply a straight line from origin to destination portraying graphically where the trip-maker begins his trip and where he wants to end it without regard to the route he must follow to get there. Individual trip desire-lines have been drawn on the City map, Figure 2. The concentration of desire-lines drawn is directly proportional to the total number of trips making the movement.

The heavy concentration of trip-desires from the Route 108 area through Bellamy Road to the central areas of Dover and beyond to Somersworth are clearly evident. High concentrations of trip-desires are evident along the Spaulding Turnpike northern corridor through Bellamy Road to the Route 108 westbound corridor. A high percentage of trip-desires also originate at and are destined for the High School through Bellamy Road from all major corridors through the City.

For purposes of analyses, the groupings of the origin/destination data points strongly suggested that the City be divided into five origin/destination zones, depicted in Figure 3. Zone A is made up of the central area of the City and all non-turnpike volumes that go through the central area to Somersworth and Maine points. 117 destination points and 124 origin points were plotted in Zone A for a total of a 33.5% share of the traffic on Bellamy Road. 80% of this traffic utilizes the Bellamy Road to Silver Street route while 20% uses Bellamy Road to Cataract Avenue.

Zone B is made up of southern Central Avenue, eastern Back River Road, Garrison Road, Stark Avenue, Dover Point Road and points south on the Spaulding Turnpike. This area had the least number of data points with 20 destination and 11 origin points for a 4.3% of the share of the Bellamy Road traffic.

Zone C is comprised of Route 108 (Durham Road), the western Back River Road area and the Mast Road area. 100 origin points and 91 destination points were plotted in Zone C for a 26.5% share of the traffic on Bellamy Road.

Zone D is made up of the Littleworth Road area, the Knox Marsh Road area and all traffic to and from the Spaulding Turnpike beyond Exit 9. 78 origin points and 38 destination

points were plotted in Zone D for a total of 16.1% of the traffic traveling on Bellamy Road.

Zone E is comprised of the Bellamy Road residential area, including Alumni Drive and the High School, Lisa Beth Circle and the Hartswood Road area. 92 destination points were plotted in the zone, while 49 origin points were plotted for a total share of 19.6% of the traffic traveling Bellamy Road.

Figure 4 clearly shows that the majority of destinations and origins desired lie within Zones A and C. These figures and the physical location and direction of Bellamy Road show that it is a collector street between two major corridors within the City. An origin/destination transportation study performed by Tibbetts, Abbet, McCarthy and Stratton in 1967 for NH DOT, US DOT, and the Cities of Dover and Somersworth concluded that Bellamy Road was indeed a collector road.

BELLAMY ROAD CLOSURE ANALYSIS

Closing Bellamy Road has been proposed to prevent through-traffic and mitigate the speeding problem. Therefore, a hypothetical closing of the northern end of Bellamy Road at the Bellamy River was studied.

The alternative routes for the diverted traffic were identified and an assessment of the key intersections that would constrain the local network was accomplished. With the northern end of Bellamy Road closed, traffic that desires to go to or from Zones A, C and D would have to seek alternate routes. The percentage of the total Bellamy Road traffic bound for or originating from Zones A, C and D is 76.1%.

The three alternative routes between Zones A and C are as follows: Central Ave. to Route 108; Locust Street to Route 108; and Silver Street to Rutland to Cataract to Route 108. The next step is to identify the key intersections that could constrain traffic volumes along these alternatives if Bellamy Road is closed to through traffic. These intersections are: Central/Stark; Central/Locust/Burger King entrance; Central/Mill/Exit 7 Ramps; Central/Cataract; and, Silver/Rutland.

Traffic destined between Zones C and D through the Bellamy Road area would also have to seek an alternate route and there are two such routes. The most direct route is Route 108 to the Spaulding Turnpike, to the Littleworth Road/Knox Marsh Road Corridor, and to Spaulding Turnpike Exit 9 and points north. The second alternative, which is less desirable due to travel time and distance factors, is Route 108 to Cataract to Rutland to Silver to the Spaulding, or Littleworth Road and Knox Marsh Road.

Figure 5 depicts diverted Bellamy Road traffic on alternative routes. Volumes used for trip assignment were derived from the average peak hour counts from SRPC taken in May 1990. Trip assignment percentages and volumes were based on shortest travel time, desire-lines, and existing turning movement volume percentages. When the alternative routes for the diverted Bellamy Road traffic are highlighted it becomes clear that all of the diversion traffic must pass through one intersection. This key intersection is the Central Ave./Mill Street/Spaulding Turnpike Exit 7 southbound ramp facility.

In order to assess the performance of four of the five key intersections with the addition of diverted Bellamy Road traffic, a 1990 baseline condition analysis was performed using existing 1990 conditions from actual counts, or by using earlier counts adjusted for 2.5% annual growth to 1990. The Central Avenue/Stark Avenue intersection was not analyzed. The Bellamy Road diversion traffic volume was then added to each affected turning movement at the four intersections and the level of service (LOS) analyses were computed again with the new traffic volumes. The comparisons of levels of service, delay times and reserve capacities may be found in Table C.

A comparison of the before and after results for levels of service (LOS) and delay in seconds per vehicle by approach shown in Table C (Signalized Section) reveals that service is degraded significantly when diversion traffic is loaded onto the alternate routes. Signalized intersection capacity is reduced from the baseline condition when the time needed for a vehicle to go through an intersection is increased, even if most of the LOS values for lane groups remain the same. For instance, at the Central Avenue/Mill Street/Exit 7 ramp intersection, the delay per vehicle in the northbound approach increases from 2.7 minutes to 4.7 minutes during the afternoon peak hour. The southbound approach increases from 2.2 minutes to 4.1 minutes delay per vehicle during the same period. The LOS remains marginally acceptable for the left turn movement, and unacceptable for through and right turn movements for both approaches.

The delay per vehicle in the northbound approach of the Central Avenue/Locust Street/Burger King drive intersection increases from 1.3 minutes to the extent that the capacity analysis program will print only an asterisk, which signifies that inordinate delays will be encountered, with queuing which may cause severe congestion affecting other traffic movements. The asterisk designation signifies that the computed values are actually off the scale. Both the >F and the * designations represent a condition that warrants improvement to the intersection. The LOS degrades from D for the left turn movement and F for the right and through to D and >F (worse than failing). The southbound approach delay increases from 1.2 minutes to excessive delay. The LOS

degrades from D for the left turn movement and D for right and through to D and >F. Signal timing specifications used for capacity analysis of this intersection were obtained from engineering drawings, and may not reflect adjustments made to compensate for actual conditions.

The unsignalized intersections were also analyzed. Both show significant reductions in service through a reduction in reserve capacity. For instance, the shared lane reserve capacity for the minor street (Cataract) at the Central/Cataract intersection was reduced from 71 to 53 vehicles per hour. LOS values remained within the marginal E range. The shared lane reserve capacity for the minor street (Rutland) at the Silver Street/Rutland Street intersection was reduced from (negative) -92 to (negative) -147. The turning movements at Rutland Street are already operating within the failure LOS range. Refer to Table C (Unsignalized section) for a summary of analysis data.

TRIP PURPOSE ANALYSIS

The traffic survey results also indicate a wide variety of reasons travelers make trips through the Bellamy Road area. Table D presents a breakdown of trip purposes. It should be noted that trips to and from work, school and business combine for almost 74% of the total trips on the road. When compared to other purposes for vehicle trips, such as shopping and pleasure, these three reasons for travelling on the road network seem to be the most dependent on time, distance and trip cost.

STREET ORIENTATION ANALYSIS

Like Central Avenue and Locust-Chestnut Streets, Bellamy Road is located in an almost direct north-south orientation, providing one of the most direct routes for travelers from the north and the central area of the City to all points south on a major arterial, Route 108. This north-south orientation corresponds to the prevalent traffic flow in the City, therefore, closing Bellamy Road would simply put the traffic on the other parallel streets through the City.

At the Route 108/Bellamy Road split, Route 108 continues in a northeasterly direction toward the extreme southern end of the central area. This road orientation does not correspond well with desire-line patterns from the study. Additionally, signalized intersections give the traveler a perceived feeling of excessive delay (although that is usually not the case if signals are operating efficiently). Therefore, the location on the road network and corresponding similarities with the direction of a majority of the desire-lines of the traffic make Bellamy Road a popular route for those travellers whose purpose is dictated by time, distance of travel, and trip cost factors.

LOCAL TRAFFIC

The breakdown between through traffic and Bellamy Road residential traffic was analyzed. There are approximately 150 residences located in the study area. The Institute of Transportation Engineer's Trip Generation Manual reports that an average of 10.062 daily trip ends (about 5 daily trips, coming and going) occur for each single family residence. Using this average and the number of residential units in the study area, approximately 1,500 of the 3,281 daily vehicle trips are home-based residential trip ends that either begin or end in the study area (Zone E). Therefore, 46% of the daily traffic on Bellamy Road is local residential traffic. The remaining 54% represents through-trips, most of which are between Zones A and C. This corresponds with the Origin-Destination study results of approximately 40% local residential and 60% through traffic.

Given the comparison results shown in both sections of Table C, the results of the analysis of traffic types using Bellamy Road, and the similarity between desire-lines and road orientation, it is recommended that Bellamy Road not be closed at any point along its length. The biggest reason for this recommendation is the severe impact on the intersections of Central Avenue/Mill Street/Exit 7, Central Avenue/Locust Street/ Burger King Drive, Rutland Street/Silver Street, and the less severe impact on the other intersections.

ONE-WAY STREET ANALYSIS

One effective method to reduce through traffic on a residential area street is to create a major discontinuity in the road network. Changing the Bellamy Road traffic flow to one-way would create the discontinuity in order to reduce through traffic. The traditional technique for implementing one-way street flow is to develop a one-way couplet to maintain the capacity of the corridor. In the Bellamy Road area, however, this technique is not appropriate, since there is not a nearby parallel street available. A one-way street treatment, therefore, would simply transfer traffic impacts from Bellamy Road to the previously discussed alternate network. The impacts on the alternate network would be approximately half of the impacts from a full closure of Bellamy Road because half of the traffic would be diverted. The direction of travel would not affect the amount of impact because the northbound and southbound traffic is equally divided. Studies show that speeds also tend to be higher on one-way streets. This is not a desirable result through the residential athletic field area. Therefore, one-way traffic flow is not recommended for Bellamy Road.

RECOMMENDATIONS

Based on the foregoing described analysis, and the City's traffic study, it is recommended that Bellamy Road not be closed at any point, and that one-way traffic flow not be implemented on Bellamy Road.

During the course of gathering data, performing calculations and research, and analyzing the conditions of Bellamy Road, several other recommendations have been identified. The following are recommended to address the issues:

1. The City should continue to implement the goals of the Transportation Section of the Master Plan regarding the Central Avenue (Rte. 108) corridor. This includes continuing with adjustments to the signal operation timing of Central/Stark/Watson and Central/Locust/Burger King, initiating the reconstruction and signalization of the Back River/Central (Rte. 108) intersection and initiating the reconstruction and signal upgrade of the Central/Silver intersection. These actions would move traffic more quickly, especially left turns onto Locust Street and Central Avenue which are parallel movements to turning onto Bellamy Road.

2. The City should follow the goals of the Master Plan by opening the second central artery of Locust Street by constructing the conceptual Walnut/Locust Streets reconstruction and traffic flow plan. Chestnut/Locust alignment runs parallel to Bellamy Road, and if made more convenient to travellers, may create a natural alternate route to Bellamy Road. Preliminary engineering for this project is complete, with final engineering underway. Approval of funding for the plan is anticipated in early March, 1991. Construction is proposed to commence at the beginning of the 1991 construction season.

3. Signals located at Central Avenue/Silver Street, Silver Street/ Locust Street, and Central Avenue/Mill Street/Exit 7 ramp should be readjusted for sequence timing by Engineering and the State's Traffic Bureau to maximize levels of service. Studies have found that retiming of signal systems for more efficient operation has reduced delays by more than 15 percent, decreased stops by 16 percent, and cut travel time by 7.2 percent. Thus, travel on the major, signalized street network would become more attractive when compared to using Bellamy Road. A traffic signal performance analysis and retiming program on a recurring basis should be instituted by the City.

4. Paint lane striping and install curbing beyond the radii of the curve on the Rutland Street northbound approach to Silver Street. This action would eliminate the unsafe use of defacto right turn lane off the pavement. It will decrease the reserve capacity of the northbound lane, and may convince motorists to use the Central Avenue corridor.

5. This study recommends not widening Bellamy Road or repaving at this time. Such action will serve to increase speeds or entice more travelers to use this direct route to their destinations. It is recommended that several safety improvements be made: reconstruction of shoulders adjacent to the athletic fields and the Alumni Drive area to improve safety; roadway drainage improvements to the Lisa Beth Circle, Bellamy Road/Alumni Drive intersections to improve safety during winter conditions; removal of two vertical curves, one located at the northern side of the athletic field area and one located near Lisa Beth Circle; replace bridge guard rails to improve safety; erect MUTCD (Manual on Uniform Traffic Control Devices) standard roadway and school safety signage; striping; and roadway luminaire repair.

6. Research into the need for a grade-separated school crossing was done. Given the average pedestrian walking speed of 4 ft/second, and a roadway width of 24 feet, it takes 6 seconds to cross Bellamy Road. The number of 6 second gaps (or opportunities to cross) during the average peak hour was determined. Using the negative exponential distribution formula for the random arrival of cars; and the 1990 Peak Hour Volume of 300 vehicles, a fairly substantial 400 to 500 opportunities to cross was calculated. Therefore, a grade-separated school crossing is not recommended at this time. When the volume on Bellamy Road doubles however, traffic control for the school crossing will be required.

   A grade-separated school crossing (bridge or tunnel) has been discussed. The most positive reason for constructing one is that pedestrians are physically removed from the roadway. Effectiveness is dependent on whether the bridge or tunnel will be used. Studies have shown that it is hard to convince pedestrians to walk farther to climb stairs for safety, rather than to cross at any convenient point on the road. This necessitates the erection of fences to funnel the pedestrian traffic to the crossing. Since the use of bridges or tunnels with fences and additional sidewalks cannot be guaranteed, their high construction costs cannot be

justified. Therefore, a cost effective, practical solution would be to install an on-demand red crossing signal in conjunction with rumble strips installed at intervals on each side of the signal crossing. The rumble strips command driver attention by the noise and vibration produced when the vehicle crosses them.

Studies have shown that rumble strips affect the upper range of acceptable speeds in residential areas. The noise generated when traversed by vehicles may be a nuisance, and the use of the strips is recommended only because of the low number of residences along the athletic field area. Studies conducted on major streets have shown that the strips have had a noticeable positive effect in reducing accidents when placed in advance of a traffic control device. Although studies cite no specific instances of bicycle accidents, cyclists often complain that the strips make riding difficult and unpleasant. Upgrading the shoulders in this area would resolve this problem. While relatively ineffective when the roadway is snow-covered, the strips do not pose any appreciable problems for winter roadway maintenance.

7. A left turn bay on Route 108 for traffic turning onto Bellamy Road should be constructed in order to channelize the traffic and to enhance safety at the intersection.

8. An ordinance to eliminate parallel parking on both sides of Bellamy Road adjacent to the High School athletic fields should be prepared for Council consideration. At the same time, plans should be prepared to construct a graded, paved parking lot adjacent to the athletic fields in Bellamy Park. These actions would eliminate the hazard of parked vehicles that hide children crossing the street from passing motorists.

9. A school zone on Bellamy Road between the athletic fields should be designated by ordinance and implemented by proper signage and striping.

TABLE A

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	5.0
B	5/1 to 15.0
C	15.1 to 25.0
D	25.1 to 40.0
E	40.1 to 60.0
F	Greater than 60.0

* SOURCE: 1985 Highway Capacity Manual

TABLE B

LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

RESERVE CAPACITY (pcph)	LEVEL OF SERVICE	EXPECTED DELAY TO MINOR STREET TRAFFIC
400	A	Little or no delay
300- 399	B	Short traffic delays
200- 299	C	Average traffic delays
100- 199	D	Long traffic delays
0- 99	E	Very long traffic delays
*	F	

* When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvement to the intersection.

SOURCE: 1985 High Capacity Manual

TABLE C: SIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY

INTERSECTION	1990 BASELINE CONDITIONS V/C RATIO	APPROACH DELAY(sec)	LOS	PROJECTED W/BELLAMY VOLUMES V/C RATIO	APPROACH DELAY(sec)	LOS
Central/Mill/Turnpike Exit 7 SB Ramp						
Eastbound	0.745	28.9	D	0.746	29.3	D
Left/Through	0.409		C	0.564		D
Right						
Westbound	0.295	22.8	C	0.295	22.8	C
Left/Through	0.046		C	0.046		C
Right						
Northbound	0.258	160.1	D	0.328	281.1	D
Left	1.272		>F	1.425		>F
Through/Right						
Southbound	0.199	134.6	D	0.199	246.4	D
Left	1.230		>F	1.383		>F
Through/Right						
Central/Locust/Burger King Drive						
Eastbound	0.326	27.0	D	0.347	27.8	D
Left/Through	0.563		D	0.617		D
Right						
Westbound	0.913	74.2	F	1.010	98.5	F
Left/Through	0.092		D	0.092		D
Right						
Northbound	0.608	78.5	D	0.683	*	D
Left	1.133		F	1.252		>F
Through/Right						
Southbound	0.138	74.0	D	0.162	*	D
Left	1.079		D	1.213		>F
Through/Right						

* Denotes excessive delay times.

NOTES:

1. Approach delay is the average stopped delay per vehicle entering the intersection, in seconds.

2. V/C is the ratio of volume over capacity. When this ratio exceeds 1.2, the level of service is worse than failing (>F) and is essentially meaningless because the performance can no longer be quantified.

3. Analysis results are from the PM Peak Hour.

4. Analysis based on methodology presented in the 1985 Highway Capacity Manual.

TABLE C: SIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY

INTERSECTION	1990 BASELINE CONDITIONS V/C RATIO	APPROACH [5] DELAY(sec)	LOS	PROJECTED W/BELLAMY VOLUMES V/C RATIO	APPROACH [5] DELAY(sec)	LOS
Central/Mill/Turnpike Exit 7 SB Ramp						
Eastbound	0.745	28.9	D	0.746	29.3	D
Left/Through	0.409		C	0.564		D
Right						
Westbound	0.295	22.8	C	0.295	22.8	C
Left/Through	0.046		C	0.046		C
Right						
Northbound	0.258	160.1	D	0.328	381.1	D
Left	1.272		>F	1.425		>F
Through/Right						
Southbound	0.199	134.6	D	0.199	246.4	D
Left	1.230		>F	1.383		>F
Through/Right						
Central/Locust/Burger King Drive						
Eastbound	0.326	27.0	D	0.347	27.8	D
Left/Through	0.563		D	0.617		D
Right						
Westbound	0.913	74.2	F	1.010	99.5	F
Left/Through	0.092		D	0.092		D
Right						
Northbound	0.608	78.5	D	0.683	*	D
Left	1.133		F	1.252		>F
Through/Right						
Southbound	0.138	74.0	D	0.162	*	D
Left	1.079		D	1.213		>F
Through/Right						

* Denotes excessive delay times.

NOTES:

1. Approach delay is the weighted average stopped delay per vehicle entering the intersection, in seconds.

2. V/C is the ratio of volume over capacity. When this ration exceeds 1.2, the level of service is worse than failing (>F) and is essentially meaningless because the performance can no longer be quantified.

3. Analysis results are from the PM Peak Hour.

4. Analysis based on methodology presented in the 1985 Highway Capacity Manual.

5. The delay times are estimated theoretical times produced by a traffic analysis model. Due to limitations in the model when conditions degrade below LOS E, approach delay times should not be taken literally. The delay times verify worsening conditions, but may not reflect length of delays actually encountered by motorists.

TABLE C: UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY

INTERSECTION	1990 BASELINE CONDITIONS		PROJECTED W/BELLAMY VOLUMES	
	RESERVE CAPACITY	LOS	RESERVE CAPACITY	LOS
CENTRAL (RTE.108)/CATARACT				
Cataract Eastbound				
Left	31	E	25	E
Right	390	B	326	B
Shared Lane	71	E	53	E
Central Northbound				
Left	396	B	322	B
SILVER/RUTLAND				
Rutland Northbound				
Left	-5	F	-22	F
Right	187	D	151	D
Shared Lane	-92	F	-147	F
Silver Westbound	375	B	337	B

NOTES:

1. Analysis results are from the PM Peak Hour.
2. A shared lane is a one lane approach that must accommodate more than one vehicle movement.
3. Reserve capacity is a measure of the remaining ability (in vehicles per hour) of the lane or approach to handle traffic after the actual volumes (demand) are subtracted from the lane's potential capacity.
4. Negative Res. Cap. values indicate demand exceeds capacity.
5. Analysis Summary based on methodology presented in Highway Capacity Manual, Transportation Research Board, Washington, D.C., (1985)

TABLE D - BELLAMY ROAD TRIP PURPOSE

SURVEY RESPONSES NB	SB	PER CENT OF TOTAL	TRIP PURPOSE
45	71	32.2%	To/from work
35	55	25.0%	To/from school
42	18	16.7%	Commercial trips
19	20	10.8%	To/from shopping
15	14	8.1%	Pleasure trips
6	7	3.6%	To/from errands
0	7	1.9%	Other trips
4	2	1.7%	To/from medical
166	194	100.0%	TOTALS

ORIGIN-DESTINATION SURVEY SPREADSHEET KEY

O-ZONE & D-ZONE.....as shown on Figure 1.

	Northbound	Southbound
PRIOR STREET.....	a. Alumni Dr.	a. Cataract Ave.
	b. Rt. 108-Dover	b. Silver St.
	c. Rt. 108-Durham	c. Knox Marsh Rd.
	d. Mast Rd.-west	d. Littleworth Rd.
	e. Mast Rd.-east	e. Spaulding T'pike
NEXT STREET.....	a. Cataract Ave.	a. Alumni Dr.
	b. Silver St.	b. Rt. 108-Dover
	c. Knox Marsh Rd.	c. Rt. 108-Durham
	d. Littleworth Rd.	d. Mast Rd.-west
	e. Spaulding Turnpike	e. Mast Rd.-east

TRIP PURPOSE.....a. to/from work
b. shopping
c. pleasure
d. school
e. business (commercial)
f. medical
g. errands
h. other

TRIP FREQUENCY.....a. daily
b. one to four times per week
c. monthly
d. yearly

TIME STOPPED.....	a. 7:00-7:15	b. 7:16-7:30
	c. 7:31-7:45	d. 7:46-8:00
	e. 11:00-11:15	f. 11:16-11:30
	g. 11:31-11:45	h. 11:46-12:00
	i. 3:30-3:45	j. 3:46-4:00
	k. 4:01-4:15	l. 4:16-4:30

ORIGIN	O-ZONE	PRIOR ST	DESTINATION	D-ZONE	NXT ST	PURP	FREQ	TIME	SURVEY
TOLEND ROAD	A	A	HIGH SCHOOL	E	A	D	A	D	JP
BROADWAY	A	A	HIGH SCHOOL	E	A	H	A	B	JP
CLIFFORD STREET	A	A	HIGH SCHOOL	E	A	A	B	C	JP
CUSHING STREET	A	A	HIGH SCHOOL	E	A	D	A	J	SS
ASH STREET	A	A	HIGH SCHOOL	E	A	D	B	I	SS
GROSSMAN'S	A	A	HIGH SCHOOL	E	A	D	B	D	SS
PROSPECT	A	A	HIGH SCHOOL	E	A	D	A	C	JP
PARKER STREET	A	A	HIGH SCHOOL	E	A	D	A	K	SS
RUTLAND STREET	A	A	HIGH SCHOOL	E	A	H	A	D	SS
RUTLAND STREET	A	A	NEWINGTON	B	B	B	B	C	SS
GROVE STREET	A	A	KINGSTON WARREN	C	C	A	A	A	SS
CHESTNUT STREET	A	A	EXETER	C	C	E	A	B	JP
RUTLAND & CATARACT	A	A	DURHAM	C	C	D	B	B	SS
WENTWORTH DOUGLASS	A	A	DURHAM	C	C	A	A	B	JP
CATARACT AVE	B	A	HOME		C	E	B	C	SS
DOWNTOWN DOVER	A	A	HOME		C	C	A	B	SS
WENTWORTH HOME	A	A	JENSENS	C	C	A	A	F	JP
CATARACT	A	A	UNH	C	C	D	A	A	SS
WOODMAN PARK SCHOOL	A	A	DURHAM	C	C	A	E	A	SS
CATARACT AVENUE	A	A	UNH	C	C	D	B	C	SS
CENTRAL/OLD ROLLIN	A	A	BELLAMY ROAD	E	N/A	B	E	B	JP
DOWNTOWN	A	A	BELLAMY ROAD	E	N/A	B	A	E	DP
PORTLAND AVENUE	A	B	HIGH SCHOOL	E	A	G	B	K	JP
DOWNTOWN	A	B	HIGH SCHOOL	E	A	D	A	D	JP
SIXTH/WHITTIER	A	B	HIGH SCHOOL	E	A	D	A	H	DP
DOWNTOWN	A	B	HIGH SCHOOL	E	A	D	B	D	SS
FOURTH STREET	A	B	HIGH SCHOOL	E	A	A	A	G	JP
SILVER STREET	A	B	HIGH SCHOOL	E	A	D	A	B	SS
MERCHANTS NAT'L	A	B	HIGH SCHOOL	E	A	A	B	F	JP
SOMERSWORTH	A	B	HIGH SCHOOL	E	A	D	B	A	JP
WENTWORTH DOUGLASS	A	B	HIGH SCHOOL	E	A	D	C	F	DP
WEST CONCORD STREET	A	B	HIGH SCHOOL	E	A	D	A	K	JP

BELLAMY ROAD O/D SURVEY SOUTHBOUND SORT Sousort.wk2

WEST CONCORD ST	A	B	HIGH SCHOOL	E	A	D	B	H	JP
WHITTIER STREET	A	B	HIGH SCHOOL	E	A	A	A	I	JP
TOLEND ROAD EXT.	A	B	HIGH SCHOOL	E	A	D	A	I	JP
WEST CONCORD ST.	A	B	HOME		B	D	A	G	DP
RICHMOND STREET	A	B	STRATHAM	C	C	A	A	B	JP
SILVER STREET	A	B	DURHAM	C	C	E	B	C	SS
BROADWAY	A	B	EXETER	C	C	E	A	I	SS
CENTRAL/OAK	A	B	DURHAM	C	C	A	B	I	SS
DOWNTOWN DOVER	A	B	DURHAM	C	C	C	A	D	SS
CENTRAL/THIRD	A	B	DURHAM	C	C	A	B	L	JP
DOWNTOWN DOVER	A	B	DURHAM	C	C	A	A	D	JP
SHOP & SAVE	A	B	DURHAM	C	C	B	B	A	JP
SHAWS	A	B	DURHAM	C	C	B	B	H	JP
DOWNTOWN	A	B	DURHAM	C	C	D	B	A	JP
CUSHING STREET	A	B	EXETER	C	C	A	A	B	JP
ROCHESTER, NH	D	B	DURHAM	C	C	A	C	K	SS
TRAFFIC CIRCLE	A	B	MADBURY	C	C	B	D	D	SS

SOMERSWORTH	A	B	EXETER	C	C	A	A	L	JP
SHAWS	A	B	NEWMARKET	C	C	A	B	J	SS
SHAW'S	A	B	DURHAM	C	C	A	A	J	SS
GLENWOOD AVE.	A	B	UNH	C	C	D	A	H	DP
SHAWS	A	B	DURHAM	C	C	B	B	H	DP
HENRY LAW AVENUE	A	B	EXETER	C	C	H	D	H	DP
DOWNTOWN DOVER	A	B	EXETER	C	C	E	C	J	SS
WEST CONCORD STREET	A	B	UNH	C	C	D	B	F	DP
DOWNTOWN DOVER	A	B	FRESHET ROAD	C	C	B	B	L	JP
BELKNAP STREET	A	B	UNH	C	C	D	A	E	JP
ALFRED, ME	A	B	NEWMARKET	C	C	A	A	H	DP
SIXTH STREET	A	B	EXETER	C	C	C	B	F	JP
DOWNTOWN DOVER	A	B	JENSENS	C	C	B	B	E	JP
SIXTH STREET	A	B	SEABROOK	B	E	C	C	E	JP
LIBERTY MUTUAL	A	B	GARRISONSCHOOL	C	E	D	B	F	JP
COURT HOUSE	A	B	SPRUCE LANE	C	E	E	A	J	JP
WASHINGTON	A	B	DREW ROAD	C	E	A	B	E	DP
SILVER STREET	A	B	LISA BETH CIR.	E	N/A	E	B	J	SS
DOWNTOWN	A	B	BELLAMY	E	N/A	A	A	G	DP
DOWNTOWN DOVER	A	B	LISA BETH CIR.	E	N/A	B	A	J	SS
DOWNTOWN DOVER	A	B	BELLAMY ROAD	E	N/A	E	B	A	SS
CHESTNUT STREET	A	B	BELLAMY ROAD	E	N/A	G	A	D	JP
DOWNTOWN	A	B	BELLAMY ROAD	E	N/A	B	A	A	SS
THIRD/CENTRAL	A	B	BELLAMY ROAD	E	N/A	E	B	K	JP
LEE, NH	D	C	HIGH SCHOOL	E	A	A	A	J	JP
C & J TERMINAL	D	C	ROUTE 108	B	A	A	B	D	SS
MADBURY	D	C	HIGH SCHOOL	E	A	A	A	A	JP
NOTTINGHAM	D	C	HIGH SCHOOL	E	A	D	D	I	SS
UNH	D	C	BACK RIVER ROAD	B	A	G	B	F	JP
BARRINGTON	D	C	HIGH SCHOOL	E	A	G	C	G	JP
UNH	D	C	HIGH SCHOOL	E	A	D	A	E	DP
MARTHAS WAY	D	C	HIGH SCHOOL	E	A	A	B	B	JP
C & J TERMINAL	D	C	ROUTE 108	E	B	A	B	I	SS

BELLAMY ROAD O/D SURVEY SOUTHBOUND SORT Sousort.wk2

WHITE CLIFF APTS.	D	C	PORTSMOUTH	B	B	A	B	K	SS
C & J TERMINAL	D	C	DURHAM	C	C	A	A	C	SS
BERWICK, ME	A	B	DURHAM	C	C	A	B	B	JP
BARRINGTON	D	C	JENSEN'S	C	C	A	B	C	JP
DURHAM	D	C	FRESHETT ROAD	C	C	E	B	D	SS
DOWNTOWN DOVER	A	B	KINGSTON	C	C	C	D	A	SS
INDUSTRIAL PARK	D	C	DURHAM	C	C	E	B	L	JP
MANCHESTER, NH	D	C	GARRISON ROAD	C	E	A	A	F	JP
DURHAM	D	C	BELLAMY	E	N/A	B	E	C	JP
BARRINGTON	D	D	HIGH SCHOOL	E	A	D	B	F	JP
LITTLEWORTH ROAD	D	D	HIGH SCHOOL	E	A	D	A	C	SS
BARRINGTON	D	D	HIGH SCHOOL	E	A	A	A	J	SS
BARRINGTON	D	D	HIGH SCHOOL	E	A	D	A	B	SS
DAVIDSON RUBBER	D	D	DURHAM ROAD	B	A	A	A	B	SS
MADBURY	D	D	HIGH SCHOOL	E	A	D	B	B	JP
BARRINGTON	D	D	HIGH SCHOOL	E	A	D	B	E	DP
BARRINGTON	D	D	HIGH SCHOOL	E	A	D	A	B	SS

BARRINGTON	D	D	HIGH SCHOOL	E	A	A	A	K	JP
SHADY LANE	D	D	HIGH SCHOOL	E	A	D	A	I	SS
BARRINGTON	D	D	HIGH SCHOOL	E	A	D	A	J	SS
BARRINGTON	D	D	HIGH SCHOOL	E	A	D	A	B	JP
WAKEFIELD, NH	D	D	HIGH SCHOOL	E	A	A	A	D	JP
BARRINGTON	D	D	HIGH SCHOOL	E	A	D	C	K	SS
ROCHESTER	D	D	ALUMNI DRIVE	E	A	A	A	F	DP
HORNE STREET	A	D	HIGH SCHOOL	E	A	D	A	D	SS
BARRINGTON	D	D	HIGH SCHOOL	E	A	D	A	D	JP
STRAFFORD, NH	D	D	HIGH SCHOOL	E	A	D	A	H	DP
OLD STAGE ROAD	D	D	HIGH SCHOOL	E	A	D	A	B	SS
BARRINGTON	D	D	HIGH SCHOOL	E	A	E	C	D	JP
LITTLEWORTH ROAD	D	D	HIGH SCHOOL	E	A	D	A	J	JP
BARRINGTON	D	D	HIGH SCHOOL	E	A	D	A	I	JP
BARRINGTON	D	D	HIGH SCHOOL	E	A	D	A	K	JP
BARRINGTON	D	D	HIGH SCHOOL	E	A	D	B	F	DP
BARRINGTON	D	D	HIGH SCHOOL	E	A	D	A	B	JP
MADBURY	D	D	HIGH SCHOOL	E	A	H	B	C	SS
BARRINGTON	D	D	HIGH STREET	A	A	C	D	C	JP
ROUTE9	D	D	SIXTH STREET	A	A	H	E	L	JP
LITTLEWORTH ROAD	D	D	ROUTE 108	C	B	A	A	D	JP
UPS	D	D	STRATHAM	C	C	A	A	B	JP
BARRINGTON	D	D	PORTSMOUTH	B	C	C	A	K	SS
DAVIDSON RUBBER	D	D	STRATHAM	C	C	A	A	K	SS
RTE.9 CROSBY	D	D	NEWMARKET	C	C	A	B	K	JP
INDUSTRIAL PARK	D	D	HOME	C	C	A	A	I	JP
TOLEND ROAD	D	D	NEWMARKET	C	C	C	B	D	SS
BARRINGTON	D	D	DURHAM	C	C	B	B	I	JP
DAVIDSON RUBBER	D	D	KITTERY	B	C	A	B	B	JP
LITTLEWORTH ROAD	D	D	DURHAM ROAD	C	C	C	B	A	SS
ROCHESTER	D	D	UNH	C	C	A	A	A	JP
INDUSTRIAL PARK	D	D	STRATHAM	C	C	A	A	K	SS
WESTWOOD CIRCLE	D	D	EXETER	C	C	A	A	F	JP

BELLAMY ROAD O/D SURVEY SOUTHBOUND SORT Sousort.wk2

BARRINGTON	D	D	NEWINGTON	B	D	A	A	H	DP
OLD STAGE ROAD	D	D	MAST ROAD	C	E	E	A	G	JP
DAVIDSON RUBBER	D	D	LISA BETH	E	N/A	A	A	J	JP
SOMERSWORTH	A	E	APPOINTMENT			F	B	L	JP
ROCHESTER	D	E	HIGH SCHOOL	E	A	D	A	I	JP
ROCHESTER	D	E	HIGH SCHOOL	E	A	D	A	K	SS
WEEKS TRAFFIC CIRCLE	A	E	HEMLOCK FOREST	B	A	A	B	I	SS
ROUTE 11	D	E	HIGH SCHOOL	E	A	A	A	D	SS
WATSON ROAD	D	E	HIGH SCHOOL	E	A	D	A	I	JP
ROCHESTER	D	E	HIGH SCHOOL	E	A	G	B	H	JP
SHAWNEE LANE	A	E	HIGH SCHOOL	E	A	A	A	H	DP
ROCHESTER	D	E	HIGH SCHOOL	E	A	D	A	E	DP
SHAWNEE LANE	A	E	HIGH SCHOOL	E	A	D	A	H	JP
SIXTH STREET	A	E	HIGH SHCOOL	E	A	C	B	E	DP
STRAFFORD FARMS ROAD	A	E	HIGH SCHOOL	E	A	A	A	A	SS
REYNORS BROOK	A	E	HIGH SCHOOL	E	A	D	A	G	DP
APACHE STREET	A	E	HIGH SCHOOL	E	A	D	B	I	JP

OLD ROCHESTER ROAD	A	E	HIGH SCHOOL	E	A	D	A	F	DP
ROCHESTER	D	E	REDDEN GARDENS	B	B	A	A	I	JP
SOMERSWORTH	A	E	NEWINGTON	B	B	C	B	E	JP
WEEKS TRAFFIC CIRCLE	A	E	NEWMARKET	C	C	A	B	D	JP
TAMWORTH, NH	D	E	UNH	C	C	D	B	D	SS
SOMERSWORTH	A	E	DURHAM	C	C	A	A	H	JP
SOMERSWORTH	A	E	DURHAM	C	C	G	B	A	JP
ROCHESTER	D	E	UNH	C	C	D	B	H	JP
ROCHESTER	D	E	NEWMARKET	C	C	A	A	D	JP
ROCHESTER	D	E	UNH	C	C	D	B	F	JP
APACHE STREET	A	E	NEWMARKET	C	C	A	A	H	JP
SOMERSWORTH	A	E	JENSENS	C	C	B	A	G	JP
FARMINGTON	D	E	NEWMARKET	C	C	A	A	K	SS
SOMERSWORTH	A	E	DURHAM	C	C	A	C	I	JP
TRAFFIC CIRCLE	A	E	DURHAM	C	C	B	B	I	SS
SOMERSWORTH	A	E	NEWFIELDS	C	C	H	D	D	JP
SERVICE MERCH.	A	E	NEWFIELDS	C	C	B	D	K	SS
SOMERSWORTH	A	E	ROUTE 108	C	C	B	E	B	SS
ROCHESTER	D	E	EXETER	C	C	A	A	E	DP
SHAWS	A	E	DURHAM	C	C	B	B	A	SS
ROCHESTER	D	E	DURHAM ROAD	C	C	A	A	D	JP
SOMERSWORTH	A	E	EXETER	C	C	C	B	C	SS
WENTWORTH DOUGLASS	A	E	HOME	C	C	F	B	C	JP
HOSPITAL	A	E	NEWMARKET	C	C	A	B	C	SS
BERWICK, ME	A	E	NEWMARKET	C	C	A	A	B	JP
SOMERSWORTH	A	E	NEWFIELDS	C	C	A	A	I	JP
NOTTINGHAM	D	E	EXETER	C	C	E	D	L	SS
ROCHESTER	D	E	STRATHAM	C	C	E	C	J	JP
SHAWS	A	E	DURHAM	C	C	B	B	J	SS
G.E/SOMERSWORTH	A	E	DURHAM	C	C	A	A	B	SS
WEEKS CIRCLE	A	E	JENSENS	C	C	C	A	A	SS
SOMERSWORTH	A	E	DURHAM	C	C	G	A	J	SS
MIRACLE MILE	A	E	NEWFIELDS	C	C	A	A	C	JP

BELLAMY ROAD O/D SURVEY SOUTHBOUND SORT Sousort.wk2

SOMERSWORTH	A	E	DURHAM	C	C	E	E	J	SS
SHOP & SAVE	A	E	DURHAM	C	C	B	B	F	DP
SOMERSWORTH	A	E	MAST ROAD	C	D	A	B	H	JP
STRAFFORD FARMS	A	E	HIGH SCHOOL	E	E	E	A	C	SS
SOMERSWORTH	A	E	HIGH SCHOOL	E	E	H	A	J	JP
WEEKS TRAFFIC CIRCLE	A	E	BELLAMY ROAD	E	N/A	G	A	I	SS
SOMERSWORTH	A	E	BELLAMY ROAD	E	N/A	A	A	F	JP
ROCHESTER	D	E	BELLAMY ROAD	E	N/A	E	B	K	JP
SIXTH STREET	A	E	BELLAMY ROAD	E	N/A	D	A	K	SS
ROCHESTER	D	E	LISA BETH	E	N/A	A	A	B	SS
PORTSMOUTH	B	E	BELLAMY	E	N/A	A	A	D	SS
SHAWS	A	E	BELLAMY ROAD	E	N/A	A	A	G	JP
SOMERSWORTH	A	E	BELLAMY ROAD	E	N/A	B	A	C	JP
SOMERSWORTH	A	E	LISA BETH CIR.	E	N/C	A	B	H	JP
BELLAMY ROAD	E	N/A	STARK AVE.	B	B	C	A	B	JP
BELLAMY/HARTSWOOD	E	N/A	PORTSMOUTH	B	E	A	A	K	SS

Norsort.wk2 01/15/91

ORIGIN	O-ZONE	PRIOR ST	DESTINATION	D-ZONE	NXT ST
High School	e	a	Silver/Rutland	a	a
High School	e	a	Ash/Sixth	a	a
High School	e	a	Washington St.	a	a
High School	e	a	Broadway	a	a
High School	e	a	Gold's Gym	a	a
Glenwood Ave.	a	a	Park St.	a	a
High School	e	a	Wallinford/Hanson	a	a
High School	e	a	Columbus Ave.	a	a
Cushing St.	a	a	Cushing St.	a	a
Dover High	e	a	Central/City Hall	a	b
High School	e	a	West Concord St.	a	b
High School	e	a	Fifth/Grove St	a	b
High School	e	a	Prospect St.	a	b
High School	e	a	Forth St.	a	b
Agway - Dover	b	a	Bellamy Park	e	b
Dover Point Rd.	b	a	Somersworth	a	b
Somersworth	a	a	Somersworth	a	b
High School	e	a	Portsmouth Navy Yard	b	b
High School	e	a	Fifth Street	a	b
Adell Drive	c	a	Richmond St.	a	b
High school	e	a	Sixth/Whittier	a	b
Oak Hill Drive	a	a	Central/Sixth	a	b
High School	e	a	Jr. High School	a	b
High School	e	a	Woodman Park School	a	b
High School	e	a	Lee	c	c
High School	e	a	Concord	c	c
High School	e	a	Littleworth Rd.	d	d
High School	e	a	Littleworth Rd.	d	d
High School	e	a	Barrington	d	d
High School	e	a	White Cliffs	d	d
High School	e	a	Bedford	d	d
High School	e	a	Rt 16/16B	a	e
High School	e	a	Varney Rd/Rt 16B	a	e
High School	e	a	Bellamy Rd.	e	n/a
Redden Gardens	c	a	Hartswood Road	e	n/a
Dover	a	b	Silver St.	a	a
Durham	c	b	Tolend Road	a	a
Paddock	c	b	Tole Ave.	a	a
Somersworth	a	b	Somersworth	a	a
Nottingham	c	c	Central Ave.	a	b
Durham	c	c	Cataract Ave.	a	b
Greenland	b	b	Sixth St.	a	b
Sixth St.	a	b	Miracle Mile	a	b
Garrison School	c	e	Hanson St.	a	b
Rt. 108	b	b	Ames	a	c
Redden Gardens	c	b	Bus	d	c
Durham	c	b	Industrial Pk.	d	d
Sixth St.	a	b	Central Ave.	a	d
Back River Rd.	b	b	Barrington	d	d

Durham	c	c	Silver St.	a	b
Rt 108 Dover	b	b	Crosby Commons	d	d
Grossmans	a	b	Davidson Rubber	d	d
Newmarket	c	c	Industrial Park	d	d
Somersworth	a	b	Barrington	d	d
Newington	b	b	Somersworth	a	e
Durham	c	c	Rochester	d	e
Durham	c	c	Courthouse	d	e
Back River Rd.	b	b	Hartswood Rd.	e	n/a
Durham	c	c	Atkinson St.	a	a
Newmarket	c	c	Somersworth	a	a
UNH	c	c	Grove/6th	a	a
Durham	c	c	Wentworth Douglas Hosp	a	a
Durham	c	c	Hospital	a	a
Durham	c	c	Washington St.	a	a
Newmarket	c	c	Silver/Sixth	a	a
Durham	c	c	Central/Henry Law	a	a
Durham	c	c	Hospital	a	a
Durham	c	c	Silver/Arch St.	a	b
Durham	c	c	Washington/Richmond	a	b
Durham	c	c	Broadway/Central	a	b
Jensen's Pk.	c	c	Miracle Mile	a	b
Durham	c	c	Washington St	a	b
Durham UNH	c	c	Sixth St.	a	b
Newmarket	c	c	Broadway	a	b
Lee	c	c	Horne St. School	a	b
Durham	c	c	UPS	d	b
Durham	c	c	Miracle Mile	a	b
Durham	c	c	Towle Ave/Silver	a	b
East Kingston	c	c	Woodman Park School	a	b
Madbury	c	c	Post Office	a	b
Raymond	c	c	Central Ave	a	b
Durham	c	c	Woodman Park School	a	b
Exeter	c	c	Police Dept.	a	b
Durham	c	c	Woodman Park School	a	b
Newmarket	c	c	Silver St	a	b
UNH	c	c	Washington/Locust	a	b
Durham	c	c	Silver St.	a	b
Durham	c	c	Tolend Rd.	a	b
Durham	c	c	Downtown Dover	a	b
Newmarket	c	c	Chestnut St.	a	b
Durham UNH	c	c	Rollinsford	a	b
Newmarket	c	c	Downtown	a	b
Durham	c	c	Woodman Park	a	b
Durham	c	c	So. Berwick	a	b
Durham	c	c	Silver/Arch	a	b
rt. 108	c	c	Downtown Dover	a	b
Durham	c	c	Cochecho Mill	b	b
Durham UNH	c	c	Lexington/Silver	a	b
Exeter	c	c	Glenwood/Central	a	b

Durham	c	c	Central/City Hall	a	b
Durham	c	c	Cataract Ave.	a	c
Durham	c	c	Somersworth	a	c
Stratham	c	c	Davidson Rubber	d	c
Durham	c	c	Dover Post Office	a	c
Exeter	c	c	Rt. 155	d	d
Durhawm	c	c	U.P.S.	d	d
Durham	c	c	Davidson Rubber	d	d
Trailer Park	c	c	Rt 9	d	d
Madbury	c	c	Davidson Rubber	d	d
Durham	c	c	Crosby rd.	d	d
Portsmouth	b	c	Horne St.	a	d
Lisa Beth Cir.	e	n/a	Sixth St.	a	d
Durham Rd.	c	c	Barrington	d	d
Durham	c	c	Somersworth	a	e
Durham	c	c	Miracle Mile	a	e
Durham	c	c	Rochester	d	e
Exeter	c	c	Somersworth	a	e
Kingston	c	c	Somersworth	a	e
Durham	c	c	Suzelles	d	e
Durham	c	c	Courthouse	d	e
Newmarket	c	c	Somersworth	a	e
Durham	c	c	Broken Pushcart	a	e
Durham	c	c	Central Ave	a	e
Durham UNH	c	c	Rochester	d	e
Durham	c	c	Somersworth	a	e
Exeter	c	c	Somersworth	a	e
Exeter	c	c	Berwick	a	e
Durham	c	c	Weeks Traffic Circle	a	e
UNH	c	c	Service Merchandise	a	e
Durham	c	c	Rochester	d	e
Durham	c	c	Central/Glenwood	a	e
Newmarket	c	c	Gonic	d	e
Newfields	c	c	Rochester	d	e
Newmarket	c	c	Somersworth	a	e
Durham	c	c	Hospital	a	e
Durham	c	c	Somersworth	a	e
Redden Gardens	c	c	Rochester	d	e
Dover	c	c	Rochester	d	e
Deerfield Drive	c	c	Miracle Mile	a	e
Exeter	c	c	Weeks Circle	a	e
Stratham	c	c	Milton Mills	d	e
Newfields	c	c	Somersworth	a	e
Durham UNH	c	c	Rochester	d	e
Paddock	c	c	Berwick	a	e
Durham	c	c	Bellamy Rd.	e	n/a
Mast Sand Pit	c	d	Silver/Rutland	a	a
Dover	c	d	Rochester	d	e
Lisa Beth Cir.	e	n/a	Jr. High School	a	a
Lisa beth Cir.	e	n/a	Downtown Dover	a	a

Bellamy Rd.	e	n/a	Somersworth	a	a
Bellamy Rd.	e	n/a	Central/Oak	a	a
Lisa beth Cir.	e	n/a	Woodman Park School	a	a
Lisa Beth Cir.	e	n/a	Central/Washington	a	b
Bellamy Rd	e	n/a	Cochecho Mills	b	b
Lisa Beth Cir.	e	n/a	First Parish Church	a	b
Bellamy Rd	e	n/a	Rochester	d	b
Lisa Beth Cir	e	n/a	Central Ave	a	b
Bellamy Rd	e	n/a	City Hall	a	b
Bellamy Rd.	e	n/a	Industrial Park	d	d
Lisa Beth Cir.	e	n/a	Massachusetts	b	e
Bellamy Rd.	e	n/a	Portsmouth	b	e
Bellamy Rd.	e	n/a	Rochester	d	e
Bellamy Rd.	e	n/a	Portsmouth	b	e
Bellamy Rd.	e	n/a	G.E., Somersworth	a	e
Bellamy Rd.	e	n/a	Miracle Mile	a	e
Lisa Beth Cir.	e	n/a	Central Ave.	a	e