CHAPTER X- PAVEMENT OVERLAY

Pavement design is traditionally based on traffic volume and load estimates. Streets that are subject to higher traffic volumes and loads require a broader pavement depth than those experiencing light loads on average. Maintaining city streets in good condition is a city responsibility that, among other things, allows King County Metro to provide transit service to residents, employees, and visitors.

A critical factor in assessing pavement needs and design is the assumed level of truck and bus traffic. Due to their weight, relative to general traffic, truck and bus traffic have a significant impact on pavement. As such, pavement design has to factor in the potential of these high load vehicles to ensure that the depth of overlay can compensate for the increased weight. In pavement design schemes, buses have been included in counts of truck traffic. However, in recent years, the level of bus traffic on Bellevue's arterial system has significantly increased. As such, an analysis of the pavement needs on transit routes in Bellevue was recently conducted to determine where pavement rehabilitation or reconstruction is required.

Transit Route Pavement Analysis Methodology

For road segments in Bellevue served by transit, bus loading was determined by considering the heaviest coach used on the street segment as well as the number of bus trips on that segment. On routes where multiple bus types are evenly divided, each size and type was considered in the evaluation. Also, the road base being overlayed with pavement was assessed by considering the resilient modulus of the subgrade materials. This combination of factors was used to determine the full depth of asphalt concrete thickness required for any given road segment.

The final step in the analysis was comparing the existing pavement depth of each roadway segment with the depth suggested by assumed load factors and subgrade qualities. Based on these findings, recommendations were developed for pavement rehabilitation or reconstruction needs as well as potential project costs.

"Pavement Rehabilitation" was considered necessary for any segment requiring an additional overlay of 2.5 inches or less. Such projects can be addressed within the City's pavement management program. Additional overlay requirements in excess of 2.5 inches were considered to be "Pavement Reconstruction" projects. These projects should be considered within the City's CIP program.

Prioritization Methodology

In addition to determining the amount of overlay required, each segment was assigned a priority ranking based on the level of bus traffic.[1] Corridors with more frequent service and associated higher pavement loading should be prioritized over those with limited bus traffic. Existing pavement conditions and automobile volumes are specifically excluded from this ranking

[1] With regard to a primary ranking criterion for prioritizing pavement improvements from a transit perspective, frequency is a more readily measured factor than bus type. Different bus types do have different axle loadings, but the type of bus on a particular street may change on a daily basis and the extremely heavy Breda dual-powered buses will be retired in several years.

methodology. These factors are already incorporated in the Bellevue Pavement Management Program.
The Transit Priority Network designation for any given segment serves as a proxy for transit volume. Based on those designations, the related priority ranking for pavement overlay is shown below:

Local Transit Access	Low Priority
Minor Transit Corridor	Medium Priority
Principal Transit Corridor	Highest Priority
Transitway	Highest Priority

Once each transit segment has received its priority ranking, it should be compared to its standing and ranking in the Bellevue Pavement Management Program. The results of the Transit Route Pavement Analysis should be used to assist choosing between projects that score closely in the Bellevue Pavement Management Program (i.e., it is a "tie-breaker" criterion). The result is that projects with higher bus pavement impacts will be prioritized for resurfacing or reconstruction over those with lower bus traffic, all other factors being equal.

Analysis Findings and Recommendations

Fifty-two arterial street segments in Bellevue were evaluated as part of the Transit Route Pavement Analysis. Of these, it was found that 10 segments require pavement rehabilitation and 33 segments are in need of pavement reconstruction.

All the segments requiring rehabilitation or reconstruction, as well as the level of overlay required, are outlined in Table X-1 and shown in Figure X-1. The priority designation is included in the final column of the table.

The total cost for the combined rehabilitation and reconstruction needs is estimated at $27.4 million. The combined rehabilitation and reconstruction costs exceed available funding sources. Therefore, from a transit perspective, the priority designation was used to assist in determining which projects are the most important.

The rehabilitation and reconstruction needs for the highest-priority projects, as defined by the Transit Priority Network, total approximately $18.5 million. In Chapter XV - Funding Alternatives, only the $18.5 million needed to address the "highest priority" projects is called out as being most beneficial to the service network requested in the Bellevue Transit Service Plan.

Table X-1
Transit Route Pavement Analysis Results and Recommendations

Map ID	Roadway	From	To	Pavement Required (inches)	Existing Pavement (inches)	Required Overlay (inches)	Action	Cost	Priority
29	112 TH AVE NE	MAIN ST	12 TH ST (NE)	12.5	7.5	5.0	Recon	$788,000	High
2	124 TH AVE NE	8 TH ST (NE)	NORTHUP WAY	8.5	7.5	1.0	Rehab	$224,840	High
4	8TH ST (NE)	100 TH AVE NE	116 TH AVE NE	15.5	13.5	2.0	Rehab	$381,465	High
10	110 TH AVE NE	MAIN ST	12 TH ST (NE)	9.5	7.0	2.5	Rehab	$167,055	High
9	6 TH ST (NE)	110 TH AVE NE	112 TH AVE NE	14.5	12.0	2.5	Rehab	$49,490	High
7	148 TH AVE NE (NB)	EASTGATE WAY	BELL. RED. ROAD	12.5	10.0	2.5	Rehab	$834,680	High
11	8TH ST (NE)	140 TH AVE NE	156 TH AVE NE	11.0	8.0	3.0	Recon	$856,667	High
12	36 TH ST (SE)	128 TH AVE SE	150 TH AVE SE	10.5	7.5	3.0	Recon	$578,667	High
14	112 TH AVE SE	MAIN ST	BELLEVUE WAY SE	11.0	7.5	3.5	Recon	$702,694	High
18	128TH AVE SE	EASTGATE WAY	NEWPORT WAY SE	12.0	8.0	4.0	Recon	$808,333	High
17	8TH ST (NE)	116 TH AVE NE	140 TH AVE NE	12.0	8.0	4.0	Recon	$1,679,167	High
19	LAKE HILLS CONNECTO	116 TH AVE SE	140 TH AVE SE	12.0	8.0	4.0	Recon	$1,349,333	High
20	106 TH AVE NE	MAIN ST	12 TH ST (NE)	11.0	7.0	4.0	Recon	$470,611	High
28	4 TH ST (NE)	104 TH AVE NE	116TH AVE NE	15.0	10.0	5.0	Recon	$700,444	High
27	1 ST ST (NE)	LAKE WA. BLVD.	8 TH ST (NE)	10.0	5.0	5.0	Recon	$46,111	High
26	NORTHUP WAY	LAKE WA. BLVD	8 TH ST (NE)	12.0	7.5	4.5	Recon	$2,531,111	High
24	8 TH ST (NE)	156 TH AVE NE	NORTHUP WAY	10.5	6.0	4.5	Recon	$728,611	High
34	24 TH ST (NE)	BELL. RED. ROAD	172 ND AVE NE	12.0	6.0	6.0	Recon	$558,389	High
40	148 TH AVE NE	BELL. RED. ROAD	60 TH ST NE	13.0	5.5	7.5	Recon	$1,021,667	High
35	NEWPORT WAY (SE)	128TH AVE SE	150 TH AVE SE	11.0	5.0	6.0	Recon	$537,733	High
37	108 TH AVE NE	8 TH ST (NE)	12 TH ST (NE)	12.5	5.5	7.0	Recon	$167,500	High
43	150 TH AVE SE	EASTGATE WAY	SE NEWPORT WAY	12.5	3.5	9.0	Recon	$742,500	High
41	108 TH AVE NE	840' S/O N0RTHUP WAY	CITY LIMITS	13.5	5.5	8.0	Recon	$398,667	High
38	156 TH AVE NE	8 TH ST (NE)	26 TH ST (NE)	12.5	5.5	7.0	Recon	$1,011,111	High
32	10 TH ST (NE)	100 TH AVE NE	102 ND AVE NE	11.5	6.0	5.5	Recon	$79,444	High
42	EASTGATE WAY (SE)	RICHARDS RD	35 TH PL (SE)	13.5	5.5	8.0	Recon	$1,086,167	High
3	116 TH AVE NE	12 TH ST (NE)	NORTHUP WAY	9.0	7.5	1.5	Rehab	$192,500	Medium
5	BELL. RED. ROAD	124 TH AVE NE	26TH ST (NE)	11.0	9.0	2.0	Rehab	$888,463	Medium
8	2 ND ST (NE)	105 TH AVE NE	106 TH AVE NE	8.0	5.5	2.5	Rehab	$16,940	Medium
6	12 TH ST (NE)	116 TH AVE NE	124 TH AVE NE	10.5	8.0	2.5	Rehab	$198,800	Medium
13	108 TH AVE NE	MAIN ST	4TH ST (NE)	9.0	6.0	3.0	Recon	$162,556	Medium
22	NEWPORT WAY (SE)	150 TH AVE SE	LAKEMONT BLVD	10.0	6.0	4.0	Recon	$812,667	Medium
23	12 TH ST (NE)	106 TH AVE NE	116 TH AVE NE	10.0	5.5	4.5	Recon	$628,583	Medium
33	RICHARDS ROAD	LAKE HILLS CONNECTOR	EASTGATE WAY	10.0	4.5	5.5	Recon	$451,333	Medium
31	119 TH AVE SE	COAL CREEK PARKWAY	60 TH ST (SE)	10.0	5.0	5.0	Recon	$687,500	Medium
36	COAL CREEK PARKWAY	LAKE WASH BLVD SE	FOREST DRIVE SE	12.5	6.0	6.5	Recon	$920,111	Medium
21	140 TH AVE NE	24 TH ST (NE)	60 TH ST (NE)	9.0	5.0	4.0	Recon	$955,167	Medium
15	140 TH AVE NE	8 TH ST (NE)	24 TH ST (NE)	10.5	7.0	3.5	Recon	$473,917	Medium
16	MAIN ST	100 TH AVE NE	116 TH AVE NE	9.5	6.0	3.5	Recon	$757,986	Low
25	100 TH AVE NE	MAIN ST	10 TH ST (NE)	10.0	5.5	4.5	Recon	$415,278	Low
1	112 TH AVE NE	12 TH ST (NE)	NORTHUP WAY	8.5	7.5	1.0	Rehab	$350,607	Low
39	8 TH ST (SE)	112 TH AVE SE	LAKE HILLS CONNECTOR	11.5	4.0	7.5	Recon	$474,667	Low
30	60 TH ST (SE)	112 TH AVE SE	COAL CREEK PKWY SE	10.5	5.5	5.0	Recon	$486,578	Low

Figure X-1
Map of Pavement Improvement Locations