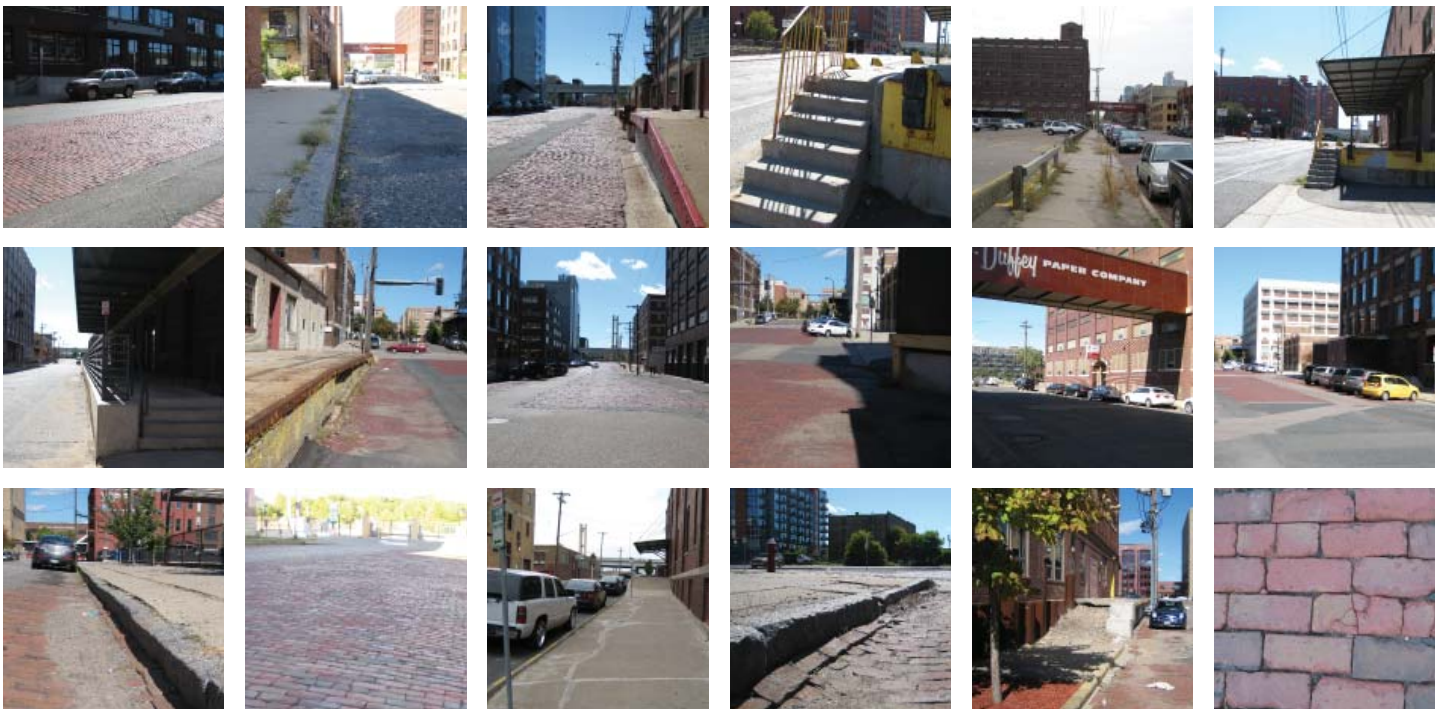
CITY OF MINNEAPOLIS

Warehouse District Heritage Street Plan



Prepared for City of Minneapolis Community Planning & Economic Development (CPED)
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APPENDIX 2
Historic Documentation

Warehouse District Heritage Streets Plan
City of Minneapolis Annual Reports - Paving

1889 Annual Report - Since this is the first version, the city engineer sums up the street paving that has been done up to this point (past 8 years). There are 24 miles of paved streets and 4 done in this year - 80% are cedar block, 20% granite. The table that lists paved streets prior to 1889 is on page 120 and it identifies portion of street and material used, the 1889 table is on page 124.

1890 Annual Report - table on page 118

1891 Annual Report - table on page 108

1892 Annual Report - table on page 116

1893 Annual Report - City engineer describes that a discussion has begun on using brick for paving (page 116). At this point, 300 of 800 city streets are paved with 63 miles of cedar block, 2.8 of asphalt, 9.5 of granite, and 2 of macadam. He goes into the cost details of each, including the base. Granite was the most commonly used for curbing. There is a discussion on page 120 about the City's success in abolishing railroad grade crossings. The table for paved streets is on page 128.

1894 Annual Report - Apparently businesses in downtown pushed for brick to start being used and brick was ordered against the engineer's advice. His report goes into extensive detail about the types of brick, where they come from, and how much they cost. There is a MAP of paved streets by material type on page 144. The paved streets table is on page 146.

1895 Annual Report - The Downtown controversy is over - they used Utah Wasatch Limerock Asphalt on Nicollet Ave instead of brick. Minneapolis is the first city east of the Rockies to use this material. The city engineer wanted to test brick on one block of Washington between 2nd and 3rd Aves S but didn't end up occurring. The Council did take a trip to Des Moines to visit the Brick Makers Association and inspect 60 miles of that city's brick pavements, and thy were in good condition. The engineer finally tested the first brick on a strip 60 feet in length on Bridge Square over Great Northern Railway tracks. They used four types of brick. The test was a success and the engineer proposes using brick my commonly, particularly if it can be manufactured closer to home (page 123). Table of paving done this year is on page 166. A MAP on page 167.

1896 Annual Report - Important year for paving, some old, dilapidated cedar block pavements finally removed and substituted with asphalt. Apparently cedar block only really is good for 5 years and asphalt has 10-year guarantee. This report points out the first ever pavement (1882) was granite on Washington south of 3rd Ave S and cedar block north of 3rd Ave S. All brick used so far in city comes from Des Moines. Page 119 has an interesting discussion on how tracks are laid in the streets and that they are a particularly a problem in the cedar block streets due to contraction and the need to fill the gaps with another material. Paving table on page 160, MAP on page 161 shows a small stretch of brick in the North Loop (but not in the district).

1897 Annual Report - Not much paving, lack of money and uncertain of what material to use. Next brick street constructed in city - 7th St between Hennepin and 7th Ave S. More mention of Purington Brick Company out of Galesburg, IL. Businesses and property owners really like the brick, also bicyclists. Paving repairs are starting to be more of a problem - old cedar block in such bad condition that they aren't being repaired but instead abandoned and covered with gravel - okay in the winter but a muddy best in summer. Now the city has started to use brick exclusively. Paving table and map on page 232.

1898 Annual Report - Bidding process to find a brick manufacturer - described on page 155. Contract let to Purington Company, lowest bidder and "furnishing, in my opinion, the best brick of all concerns bidding". City also trying Kettle River Sandstone blocks, laid in parts of North Loop - 1st Ave N from Washington to 4th St and 3rd Ave N from 2nd to 3rd Sts. Paving table on page 201. Another interesting table on page 205 of pavement removed and replaced by other pavement - first year this is inventoried.

1899 Annual Report Annual Report - Annual Report discusses the maintenance of different paving types found within the City. City Engineer has discussed the maintenance of different paving types with seven leading cities. These discussions regard the merit of each paving type but notes to give the tax payers their monies worth depends not only on the material but also the method of placement and treatment afterwards. Too much sprinkling and sweeping are detrimental to pavements and the “seven” department heads have all but condemned the sprinkling of asphalt paving.

City paving map found on page 181

Kettle sandstone pavers laid in lieu of cedar blocks on 3rd avenue n – from 2nd street n to 3rd street north. Remainder of block from fifth street to (175’ towards 4th street was laid with the same sandstone material. See page 197 of pavement removed and replacement chart. Washington Avenue replaced from 3rd Avenue s to 3rd avenue n from cedar block to asphalt.

First year bicycle paths showed up in the engineers report.

1900 Annual Report - For the first time in the history of the city all of the paving, curb and gutter was done by day labor (city had to purchase equipment and find skilled laborers).

Engineer noted that Washington Avenue from 3rd Avenue N to 5th avenue N was to be paved with brick pavers in the upcoming year. Businesses in the area contributed money to intersections.

A large portion of Washington Avenue from 5th avenue n to 14th avenue n was repaved with brick from cedar block. Granite curb was also set as part of this project. See pavement removal and replacement chart on page 175. No paving map.

1901 Annual Report - Cost of pavement repairs in the city exceeded pavement repairs from the previous year. This excess was associated to brick pavements to the use of tar filler. This filler was adopted in place of cement filler at the request of property owners so that the street might be cured quickly in condition for travel. Tar filler would provide a more “elastic” condition that the cement filler and reduces the expense of replacing the pavement when tore up for subway work.

The following streets were recommended for replacement….Fifth avenue n – 2nd street to Washington Avenue. Paving done in 1901 included….Washington Avenue N – 5th Avenue intersection, Washington avenue n - 3rd avenue to 4th and then 4th to 5th avenue including the bridge. See chart on page 169.

Paving removed and replaced includes…. Washington Avenue N – 5th Avenue intersection (cedar block to brick), Washington avenue n - 3rd avenue to 4th avenue (brick) and 4th to 5th avenue (sandstone on concrete). See chart on page 171

Chart on page 173 defines asphalt paving on Washington Avenue from 3rd Avenue s to 3rd Avenue n as being installed in 1896.

1902 Annual Reports - 1902 is the first mention of creosoted wood block paving materials. Also a wide variety of installation methods defined.....granite on sand or concrete, brick, sandstone on sand or concrete and Macadam with granite or limestone dressing.

Engineer identified issues with Macadam paving and considers the system a total failure and has expensive maintenance costs.

Paving done chart on page 164 identifies new paving on 8th Avenue N from Washington to the ROW of the SOO railroad.....paved as macadam L. top...

Paving done on 2nd avenue N – 1st Street N to ROW of W.C. RY.....Purington Brick

TABLE No. 13.

Paving Done During the Season of 1902 and Assessed in the Taxes for the Year 1902.

All assessable property is assessed for the cost of the street on which the property abuts. The cost of paving all street intersections and parts along property exempt from special assessments is paid out of the permanent improvement fund, which is raised by general taxation. The paving is paid in five equal annual installments, with interest at five per cent per annum on all deferred payments. All work done by the city by day labor.

STREET.	From—	To—	Kind.	Width in Feet			Rate of Assessment Per Sq. Yd.	Cost per Sq. yard.	Length Paved in Feet and 10ths.	Square yards Paved by		Cost of Paving Laid by City.	Amount of Assessment.
				Paved by St. Ry. Co.	Paved by City.	Roadway.				Street Railway Co.	City.		
Alley, Block 37	Town of Minn	eapolis	Purington Bl'k Bk.	.....	10.0	10.0	.....	2.69	55 4	.....	57.10	153.85	Money adv'c'd
Cedar av.	5th st.	7th st.	Purington Bl'k Bk.	15.1	34.9	50.0	2.10	2.19	832.3	1,399.98	3,878.67	8,503.48	4,938.01
Hennepin av.	10th st.	13th st	Sandstone on Con.	15.1	48.9	64.0	2 58	2.54	1,100.3	** 1,939.67	6,317.46	18,042.83	12,843.23
Hennepin av.	13th st.	Harmon Pl.	Sandstone on Con.	15.1	48.9	64.0	2.60	2.64	1,789.3	§ 3,007.57	19,244.22	27,067.34	22,381.18
Main st. N. E.	Central av.	1st av. N. E.	Macadam Gr. Top.	.....	56.0	56.0	1.25	1.13	405.0	.....	2,609.36	2,943.36	2,847.48
Main st. N. E.	3rd av. N. E.	4th av. N. E.	Macadam L. Top.	.....	47.0 56.0	47.0 56.0	.96	96	612.0	.....	4,417.07	4,240.39	2,870.79
Marshall st. N. E.	4th av. N. E.	5th av. N. E.	Macadam Gr. Top.	.....	34.0	34.0	1 25	1.25	554.25	.....	2,274 87	2,848.14	2,803.74
Nicollet av.	13th st.	Grant St.	Purington Bl'k Bk.	....	50.0	50.0	....	2.32	424.55	.....	2,369 73	5,493.86	Assess. in 1903
Univ. av. S. E.	7th av. S. E.	10th av. S. E.	Sandstone.	.....	40.0	40.0	1.96	1.91	1,309.7	.....	6,529.73	12,502.17	8,744.36
Univ. av. S. E.	10th av. S. E.	14th av. S. E.	Sandstone.	.....	40.0	40.0	1.96	1.94	1,332.7	.....	6,266.32	12,156.12	11,335.42
Western av.	N. Irving Av.	N. James av.	Purington Bl'k Bk.	15.1	26.9	42.0	2.10	2.37	299.2	501.99	859 63	2,035.78	1,815.03
1st av. N.	1st st.	R.of W.W.C.Ry	Purington Brick	.....	50.0	50.0	.....	.....	157.8	.....	988.60	.....	By W.C.Ry.Co.
1st av. N.	5th st.	6th st.	Sandstone.	.....	50.0	50.0	1.86	1.91	341.3	.....	1,926.10	3,886.63	3,412.20
2nd av. N.	1st st.	R.of W.W.C.Ry	Purington Brick	.....	50.0	50 0	.....	.....	170.5	.....	947.23	.....	By W.C.Ry.Co.
2nd av. N.	Wash. av. N.	4t st.	Sandstone.	.....	50 0	50.0	1.86	1 87	682.0	.....	3,822 60	7,166.51	6,865.76
3rd av. N.	1st st.	2nd st.	Sandstone.	.....	50.0	50.0	1.86	1 81	333.5	.....	1,906.16	3 453.67	3,354.35
6th av. S.	Wash. av. S.	3rd st	Sandstone.	.....	50.0	50.0	1.86	1.86	331.15	.....	1,861 32	3,469.97	3,306.63
8th av. N	Wash. av. N.	R.of W.Soo.Ry.	Macadam L. Top.	.....	40.0	40.0	.....	.....	166.0	.....	718.56	.....	Private Parties
10th av. S.	Wash. av. S.	3rd st	Purington Bl'k Bk.	.....	50.0	50.0	2.04	2.06	332.4	.....	2,275.37	4,694.30	4,475.23
10th st. S.	1st av. S.	Park av.	Creosoted Wood Bk	.....	39.0 40.0	39.0 40.0	2.79	2.79	3,145.95	¶ 262.80	13,304.69	37.120.08	26,343.47
20th av. N.	Miss. R. Bdge.	Wash. av.	Sandstone.	.....	64.0	64.0	1.82	1.82	1,183.0	.....	8,666.11	15,772.32	12,822.91
20th av. N.	Wash. Av. N.	4th st.	Sandstone on Con.	15.1	40.9 48.9	56.0 64.0	2.60	2 63	739 85	† 1,247.07	3,924.87	10,320.62	8,450.69
20th av. N.	4th st.	N. Lyndale av.	Sandstone.	15.1	40.9	56.0	1 90	‡	857.4	‖ 1,357.40	‡ 2,477.80	7,926.38	6,118.90
Totals									17,155.55	9,716.48	88,643 57	187,597.80	$145,529.38
												6,805.33	Cost in 1903
												180,792.47	Net cost of Paving in 1902

.8475 miles of creosoted wood block.
.2959 miles of granite on concrete.
1.4814 miles of sandstone on concrete.
2.1121 miles of sandstone on sand.
.8381 miles of Brick.
.3083 miles of macadam (granite top).
.3242 miles of macadam (limestone top).

6.2075 miles of average 27 ft. roadway.

*Not finished
**Granite.
§In this amount 805.24 sq. yards sandstone, 2202.33 sq. yards is granite.
†In this amount 55.17 sq. yards granite, 1191.90 sq. yards sandstone.
‡Not yet finished (to be in 1903).
¶Of this amount namely 262.8 sq. yards, 120.94 sq. yards is creosote block balance or 141.86 sq. yards is granite.

‖Of this amount 348.6 sq. yards is Granite balance 1008.8 sq. yards sandstone.

1903 Annual Reports - No text descriptions of paving.

Paving done on 4th avenue n – 1st street n to 2nd street North.....sandstone on sand

Paving on 5th avenue n – 2nd street n to ½ way to Washington .....sandstone on sand

1904 Annual Reports - Paving on 5th avenue n –Washington to ½ way at 2nd street n .....sandstone on sand

1905 Annual Reports - Nothing significant

1906 Annual Reports - Pavement map on page 36 of engineers report

Paving on 10th avenue n –Washington Avenue to 2nd street n.....cedar block to sandstone on sand, and Washington Avenue to 3rd street n.....cedar wood block to sandstone on concrete

Engineers report provided a report on cooperative comparative test of different woods for creosoted block paving....test was on Nicollet Avenue between Washington Avenue and 1st street.

See scanned maps and documents..

1907 annual reports - Pavement map on page 35 of engineers report

No significant pavement replacement in project area

1908 Annual Reports - Pavement map on page 8E

Documentation in annual report of more creosote pavement usage throughout the City.

No significant pavement replacement in project area

1909 Annual Reports - Pavement map on page 14E

No significant pavement replacement in project area

1910 Annual Report - Pavement Map on Page 14e

Only significant pavement repair/ replacement in the project area along 3rd Avenue N – 2nd Street n to 4th Street N....pavement replaced was creosoted southern pine from sandstone.

Annual report paving replacement chart found on 16e identifies 85% of all pavement replacement within streets was with creosoted wood blocks. Brick was the primary material used for alleys.

1911 Annual Reports - Pavement map found on page 16e

Pavement chart found on page 18e

6th Avenue N – Washington Avenue to 5th Street N ,.....sandstone on sand

5th Avenue N – Washington Avenue to 3rd Street N .....creosoted block

3rd Street N – 3rd Avenue N to 6th Avenue N .....creosoted block

1912 Annual Reports - Pavement map found on page 8e

3rd Street N –6th Avenue N to 7th Avenue N .....creosoted block

7th Avenue N – Washington Avenue to 3rd Street N....creosoted wood block

1913 Annual Reports - During 1913 over 90,386 sf of 3.5" creosoted block was laid in the City and another 44, 857 4" creosoted block was laid....this was more than half of the 222,000 sf of pavement materials for the year.

During this year the City purchased the previous Railway portable asphalt plant and laid roughly 11,200 sf of asphalt on some of the major streets in the City (University Avenue, Plymouth Avenue, first Avenue N, second Avenue N.

Creosoted wood block pavements – the wood used for the creosoted pavements was southern yellow pine (also called long leaf yellow pine). And was treated in Minneapolis utilizing standard specifications defined by the association of standardizing paving specifications; using 16 pounds of oil per cubic foot of wood.

See pavement map on page 8e

8th avenue n – Washington Avenue to 3rd street n.....creosoted wood block

3rd avenue n – 4th street n to 5th street n .....creosoted wood block from sandstone on sand

2nd avenue n – Washington Avenue to 2nd street n ....asphalt

4th avenue north – 1st street n to 2nd street n ....granite

TABLE NO. 10.

PAVING DONE IN THE SEASON OF [illegible]

All assessable property is assessed for the cost of paving that part of the street on which the property abuts. The cost of paving all [illegible] of the permanent improvement fund, which is raised by general taxation. The paving is paid in [illegible] on all deferred payments. All work done by the city [illegible].

Street	From	To	Kind of Paving	Width Paved by St. Ry. Co. Feet	Width Paved by City Feet	Width Roadway Feet	[illegible] per square Yard	[illegible] per square Yard	[illegible]	[illegible]	[illegible]	[illegible]
Alley in blk 14, Harmons' add	12th st S	Lots 2 and 9	Creosoted wood		13.5	14	$2.91	[illegible]	[illegible]		[illegible]	[illegible]
Alley bet. Clinton and 3d avs S	26th st	S line lot 11, blk 2, R. A. Davidson's	Concrete		12	12	1.55	[illegible]	[illegible]		[illegible]	[illegible]
Alley in blk 3, Hoag & Bells add	7th st N	End of alley	Brick		10	10	3.26	[illegible]	[illegible]		[illegible]	[illegible]
Alley in blk 12, Snyder & Co.'s 1st addition	10th st S	11th st S	Brick		12	12	2.57	[illegible]	[illegible]		[illegible]	[illegible]
Blaisdell av	24th st	25th st	Creosoted wood		28	30	2.57	2.56	[illegible]		[illegible]	[illegible]
Blaisdell av	Elroy st	Lake st	Creosoted wood		28	30	2.60	2.65	[illegible]		[illegible]	[illegible]
*Broadway st	Tyler st	Johnson st	Brick		38	40	.92	2.25	[illegible]		[illegible]	[illegible]
Calhoun blvd	Lake st	Dean blvd	Concrete		24	28	1.13	1.13	[illegible]		[illegible]	[illegible]
Chicago av	14th st	Franklin av	Creosoted wood	15.2	29.14	46	2.55	2.48	[illegible]	[illegible]	[illegible]	18,728.20
Clinton av	22d st	24th st	Creosoted wood		28	30	2.52	2.48	[illegible]		[illegible]	[illegible]
Excelsior av	Lake st	City limits	Concerete		16	40	1.40	1.38	[illegible]		[illegible]	[illegible]
8th st S	Nicollet av	Hennepin av	Creosoted wood		25.4	38	2.00	1.98	[illegible]		[illegible]	[illegible]
†8th av N	Washington av	3d st N	Creosoted wood		40	40	2.50	2.50	[illegible]		[illegible]	[illegible]
‡8th av N	Humboldt av	Elwood	Macadam		30	32		1.17				[illegible]
¶11th av N	Irving av	Knox av	Macadam		30	32	1.48	1.53	346		[illegible]	[illegible]
Farwell av	Sheridan av	Thomas av	Macadam		28	30	1.35	1.35	311		[illegible]	[illegible]
§1st av N	4th st	5th st–N ½	Asphalt		17.4	50		1.26	311		[illegible]	[illegible]
4th st N	20th av N	21st av N	Creosoted wood		30	32	2.50	2.53	380		[illegible]	[illegible]
§4th av N	1st st	2d st	Granite		20	50		1.43	200		[illegible]	[illegible]
14th av N	Oliver av	Penn av	Macadam		30	32	1.45	1.49	261		[illegible]	[illegible]
§42d av N	Bridge over river		Creosoted wood		31	36		1.66	1,372		[illegible]	[illegible]
Girard av N	Plymouth av	20th av N	Concrete		30	32	1.44	1.44	2,542		[illegible]	[illegible]
Hennepin av	10th st	15th st	Creosoted wood	15.2	48.8	64	2.25	2.25	1,828		[illegible]	[illegible]
Hennepin av	31st st	36th st	Creosoted wood		30	32	2.50	2.49	3,230		[illegible]	[illegible]
E Island av	Central av	N line lot 5 Nicollet Island	Creosoted wood		28	30	2.66	2.66	1,102		[illegible]	[illegible]
‡E Lake st	29th av S	River	Creosoted wood	15.2	3	50		2.45		[illegible]	[illegible]	[illegible]
Monroe st	Broadway st	15th av NE	Creosoted wood		30	30	2.35	2.37	1,590		[illegible]	[illegible]
¶19th av N	Thomas av	Xerxes av	Concrete		34	36	1.21	1.67	1,274		[illegible]	[illegible]
Oliver av N	Plymouth av	16th av N	Macadam		26	28	1.45	1.49	1,276		[illegible]	[illegible]
*Penn av N	Crystal Lake av	36th av N	Creosoted wood	15.2	20.8–32.8	38 & 50	2.60		3,432	[illegible]	[illegible]	[illegible]
■Penn av N	Crystal Lake av	19th av N	Concrete		30	32	.99	1.36	1,785		[illegible]	[illegible]
Pillsbury av	24th st	28th st	Creosoted wood		30	32	2.57	2.58	2,617		[illegible]	[illegible]
Pleasant st	University av	N. P. Ry	Creosoted wood		25 & 30	25 & 30		2.42	1,226		[illegible]	[illegible]
§Plymouth av	Bridge over river		Creosoted wood		34	34		1.86	935		[illegible]	[illegible]
§Plymouth av	Washington av	2d st N	Asphalt		42	42		.76	331		[illegible]	[illegible]
Richfield av	Calhoun blvd	39th st	Concrete		16	36	1.30	1.69	592		[illegible]	[illegible]
Sheridan av	10th av N	Farwell av	Macadam		30	32	1.35	1.35	106		[illegible]	[illegible]
Superior av	Hennepin av	Lyndale av	Creosoted wood		32	34	2.50	2.54	530		[illegible]	[illegible]
Superior av	Lyndale av	Bridge	Concrete		16	34	1.23	1.20	3,487		[illegible]	[illegible]
§Superior av	Brownie Lake	City limits	Concrete		16	34		1.50	1,469		[illegible]	[illegible]
§2d av N	Washington av	2d st N	Asphalt		50	50		.76	337		[illegible]	[illegible]
16th av N	Queen av N	Russell av	Macadam		30	32	1.66	1.66	330		[illegible]	[illegible]
3d av N	4th st N	5th st N	Creosoted wood		50	50	2.83	2.83	346		[illegible]	[illegible]
§3d st S	5th av S	7th av S	Asphalt		50	50		.68	658		[illegible]	[illegible]
10th av S	6th st	8th st	Creosoted wood	15.2	40 & 34.8	40 & 50	2.50	2.50	722	[illegible]	[illegible]	[illegible]
10th av N	Irving av	Knox av	Macadam		26	28	1.45	1.48	500		[illegible]	[illegible]
12th av N	Thomas av	Washburn av	Macadam		18	20	1.45	1.54	830		[illegible]	[illegible]
E 24th st	Clinton av	4th av S	Creosoted wood		28	30	2.52	2.46	272		[illegible]	[illegible]
E 26th st	Nicollet av	Park av	Creosoted wood		50&34,32 &32,34	50 & 34	2.38	2.37	3,087		[illegible]	[illegible]
§W 36th st	Hennepin	Lake Calhoun	Concrete		16			1.59	1,348		[illegible]	3,809.27
University av SE	Central av	1st av NE	Creosoted wood	5.1	50.9	56	2.35	2.35	105	[illegible]	[illegible]	5,165.15
§University av NE	1st av SE	3d av SE	Asphalt		40	40		.76	753		[illegible]	3,716.54
Upton av N	12th av N	Plymouth av	Macadam		28	30	1.53	1.54	482		[illegible]	2,154.73
Vincent av	12th av N	Plymouth av	Macadam		28	30	1.51	1.54	485		[illegible]	2,157.00
▲Washington av	3d av S	12th av S	Creosoted wood	15.2	48.5	64	2.60	2.60	3,699		[illegible]	61,504.21
Western av	7th st N	Railway bridge	Creosoted wood	15.2	26.8	42	2.10	2.10	1,837		[illegible]	12,030.20
Total									61,117	[illegible]	[illegible]	$456,773.95

*$6,697.27 from good roads.
†To be assessed in 1914.
‡Assessed in 1912.
§No assessment.
¶$2,250 from good roads.
•To be finished in 1914.
■$2,033 from good roads.
▲$19,975.7[illegible] from C. M. & St. P. Ry.

1914 annual reports

1915 annual reports

1916 annual reports

See Table on page 74 for new pavements in 1916

2nd Ave N – 1st Street N to 2nd Street N …..4" creosote to replace (1904) sandstone on sand

2nd Ave N – Washington Avenue to 4th Street N …..4" creosote to replace (1902) sandstone on sand

3rd Avenue N – 1st Street N to 2nd Street N ……..granite to replace (1902) sandstone on sand

Washington Avenue N – 3rd Avenue N to 24th Avenue N……asphaltic concrete to replace (1901) brick from 3rd Avenue N to 4th Avenue N and (1900) from 8th Avenue N to 14th Avenue N

1917 annual reports

See Table on page 98 for new pavements in 1917

4th Street N - 1st Avenue N to 3rd Avenue N……4" creosote wood to replace sandstone on sand (1905)

1918 annual reports

See Table on page 74 for new pavements in 1918

3rd Street N - 7th Avenue N to 10th Avenue N…..4" brick

TABLE No. 6

PAVING LAID DURING THE SEASON OF 1918

STREET	FROM	TO	KIND	Width Paved by Street Railway Feet	Width Paved by City Feet	Width of Roadway Feet	Rate of Assessment Per Square Yard $	Cost Per Square Yard $	Length Paved in Feet	Square Yards Paved by Street Railway	Square Yards Paved by City	Cost of Paving Laid by City	Amount of Assessment
Alley in Aud. Sub. No. 30	12th st	Mary Place	3" Brick		20.0	20.0	3.01	$3.01	433.8		977.7	$2,941.51	$2,849.36
Alley bet. Emerson and Fremont	6th av N	11th av N	7" P. C. Concrete		16.0	16.0	2.25	2.31	1,614.5		2,858.2	6,434.90	6,178.80
Alley bet. Fremont and Girard	6th av N	11th av N	7" P. C. Concrete		16.0	16.0	2.25	2.14	1,644.3		2,912.5	6,077.49	6,374.20
Alley bet. Hennepin & Holmes	Lake st	31st st	7" P. C. Concrete		11.9	12.0	2.10	2.21	584.0		739.2	1,640.01	1,560.86
Alley bet. Humboldt & Irving	22nd st	24th st	7" P. C. Concrete		14.6	14.0		2.08	599.2		960.2	1,944.17	
Alley bet. Irving and James	28th st	29th st & James	7" P. C. Concrete		13.4	14.0	1.96	1.95	1,036.6		1,581.9	3,006.22	2,915.06
"A," "C," Cedar av	Lake st	38th st	3½"creosoted wood	15.2	22.8	40.0		2.91	5,259.7		13,063.7	37,982.83	25,113.87
"A," "C," Chicago av	24th st	Lake st	3½"creosoted wood	15.2	34.8	52.0		2.78	3,757.9		15,082.3	41,818.34	12,677.33
"B" Crystal Lake av	20th av N	26th av N	Asph.Con. Res'face		40.8 34.8 32.8	56.0 48.0 40.0	0.97	1.48	4,662.3		21,056.8	31,051.46	14,786.56
4th av S	28th st	Lake st	3½"creosoted wood	15.2	20.8	36.0	3.65	3.65	894.8	1,524.0	2,172.2	7,830.07	2,344.13
4th av S, widening	10th st S	22nd st E	4"creosoted wood		4.0	40.0	4.08	4.05			2,074.5	8,402.53	7,493.65
"C" 14th st W	Nicollet av	Willow st	3½"creosoted wood		30.3	32.0		2.67	854.9		2,983.8	7,960.37	7,087.54
First av NE	Univ. av NE	4th st NE	4" brick		9.8	40.0	3.15	3.86	389.9		367.0	1,415.51	1,353.00
Fifth av N	7th st	Royalston av	4" brick		34.0	36.0	2.93	2.98	414.1		1,858.4	5,533.10	4,618.54
"A" "C" Minnehaha av	Lake st	48th st	3½"creosoted wood	15.2	34.8	50.0		2.74	1,939.9		7,546.6	21,904.77	94,674.07
"A" 9th st S, widening	Hennepin av	Nicollet av	4"creosoted wood		29.6	51.0		3.20			2,835.7	9,070.51	
2nd av S	1st st S	Washington av	Granite		50.0	50.0	2.80	2.80	663.2		3,779.6	10,612.16	4,823.60
2nd st S	Marquette av	3rd av S	Granite		50.0	50.0	2.83	2.83	772.7		4,529.5	12,826.70	7,781.40
3rd av S	1st st S	2nd st S	4"creosoted wood		50.0	50.0	3.44	3.45	503.3		3,231.3	11,121.77	5,975.00
3rd st N	7th av N	10th av N	4" brick		50.3	52.3	2.94	2.94	1,455.2		8,556.8	25,136.08	20,905.11
10th av S	38th st E	40th N	7" P. C. concrete		30.0	32.0	Billed	3.05	37.5		125.0	381.37	
10th av SE	Como av	E Hennepin av	3" brick		21.0	40.0	3.01	3.09	1,248.1		2,665.8	8,223.75	5,669.4
"B" 20th av N	Lyndale av	Crystal Lake av	Asp.cone.Re'rface		40.8	56.0	0.97	1.48	2,525.1		11,961.4	17,638.42	9,577.97
23rd av NE	Fillmore st	Johnson st	7" P. C. concrete		25.0	27.0	2.08	2.08	1,298.7		4,301.3	8,965.30	6,067.71
26th st E	Park av	Chicago av	3½"creosoted wood		32.0	34.0	3.44	3.44	572.3		2,230.1	7,671.00	6,080.77
"A," "C" 26th st W	Pillsbury av	Lake of the Isles	3½"creosoted wood		38.0 34.0 32.0	40.0 36.0 32.0		2.72	4,264.3		17,190.0	46,900.24	41,917.07
Washington av S	12th av S	Cedar av	3½"creosoted wood		48.8	64.0	2.82	2.82	1,327.0		8,045.8	22,670.52	16,365.03
"C" Yale Place	12th st S	Willow st	3½"creosoted wood		30.0	32.0	2.70	2.74	980.3		3,364.7	9,210.27	8,648.55

"A"—Ordered under the Elwell Law. "B"—One half of cost assessed by Resolution of Council "C"—Partly done in 1917.

1919 annual reports

See Table on page 79 for new pavements in 1919. Pavement map on page 22

9th Avenue n – Washington Avenue to 4th Street N……..4" brick

1st Street N – 1st Avenue N to 3rd Avenue N…..granite on concrete to replace (1885) granite on sand

TABLE No. 6

PAVING LAID DURING THE SEASON OF 1919 AND ASSESSED IN TAXES OF 1919

STREET	FROM	TO	KIND	Width Paved by Street Railway Feet	Width Paved by City Feet	Width of Roadway Feet	Rate of Assessment Per Square Yard	Cost Per Square Yard	Length Paved in Feet	Square Yards Paved by Street Railway	Square Yards Paved by City	Cost of Paving Laid by City	Amount of Assessment
Alley Between	Park & Columbus	32st to 33st	Concrete		12.0	12.0	$2.64	$2.64	533.1		718.1	$1,895.8	$1,810.16
Alley between	Park & Oakland	32st to 33rd	Concrete		12.0	12.0	2.64	2.64	620.9		840.3	2,218.39	2,093.00
Cedar Av	48th st	32nd st	Concrete		36.0	40.0	1.78	1.78	2,742.5		10,922.8	19,396.25	8,817.41
(a) (d) Cedar av	38th st	48th st	3½" Creosoted wood		22.0	40.0	4 00	5.13	6,481.0		14,689.3	74,031.93	49,326.37
Central av	Main st	2nd st SE	3½ Creosoted wood		56.0	56.0	3.98	3.98	391.2		2,495.8	9,934.79	7,291.82
Emerson av	5th av N	Plymouth av	Asphaltic concrete		30.0	32.0	2.38	2.38	3,280.6		11,787.0	28,086.76	24,352.63
(b) (d) 8th av NE	2nd st NE	5th st NE	3½" creosoted wood		34.0	36.0	4.0		763.0		3,040.3	13,100.33	13,839.91
(b) (e) (d) (f) 5th st S	Henn. av	Nicollet av	3½" creosoted wood		22.2	48.0	3.00				1,356.3	3,844.64	13,277.70
18th av N	Wash. av N	2nd st N	Concrete		30.0	32.0	2.13	2.13	319 0		1,202.5	2,567.62	2,414.92
1st st	3rd av N	6th av S	Gran. on Concrete		Irregular	Irregular	3.20	3.18	3,303.0		16,440.4	52,180.19	43,276.27
1st av S	Grant st	22nd st	3½" creosoted wood		30.0 32.0	32.0	3.66	3.71	3,109.0		11,746.1	43,537.31	35,130.24
4th st	1st av N	4th av S	3½" creosoted wood	15.2	50.0 34.8 52.2	52.2 50.0	3.22	3.22	2,286.0		11,674.3	37,581.09	27,445.42
15th av NE	Quincy st	Jackson st	3½" creosoted wood		36.0 47.2	36.0	3.65	3.65	310.5		707.7	2,577.37	2,444.04
Hennepin av	Washington av	10th st	3½" creosoted wood	15.2	48.8 24.0	64.0 26.0	3.12	3.12	3,153.0		17,939.1	55,951.16	43,509.73
(b) (c) Humboldt av N	6th av N	Plymouth av	Concrete		34.0	36.0	2.30		1,963.8		5,834.0	12,155.36	11,630.00
Jackson st	15th av NE	15th av NE	3½" creosoted wood		38.0 16.0	38.0 16.0	3.65	3.65	147.4		572.8	2,083.08	1,864.27
Jewett Pl	6th av N	11th av N	Asphaltic concrete		22.0	24.0	2.73	2.73	1,668.6		3,877.6	10,556.74	9,813.25
(b) (d) Johnson st	Lowry av	29th av NE	3½" creosoted wood		19.0	40.0	4.00		2,000.0		4,740.3	20,545.09	19,303.33
(b) (c) (d) (f) Mary Place	8th st S	Vine Place	3½" creosoted wood		Irregular 40.0	50.0	3.00				4,261.4	14,611.96	37,563.00
9th av N	Washington av	4th st N	Brick		38.0 39.0 28.2	40.0	3.35	3.35	658.0		2,952.4	9,885.88	8,243.54
Oak st	Wash. av SE	Univ. av SE	3½" creosoted wood		38.3	43.5	3.92	3.92	666.0		2,011.6	7,881.78	5,032.67
Portland av	27th st	Lake st	3½" creosoted wood		38.0	40.0	3.67	3.67	1,804.0		7,844.7	28,752.50	25,661.90
(e) Plymouth av	Humboldt av	Penn av N	3½" creosoted wood	15.2	32.7 28.0	49.9 30.(	3.90	3.60	2,568.0		10,397.3	37,366.78	20,631.60
(b) Quincy st	Broadway	15th av NE	Brick		38.0	40.0	3.33		306.8		1,348.3	19,151.01	19,033.40

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1920 annual reports

See Table on page 15 for new pavements in 1920

10th Avenue N – 3rd Street N to 5th Street N…..4” VF brick to replace (1892) cedar block

1921 annual reports

See Table 8 on page 16 for new pavements in 1921

1st Street N - 3rd Avenue to Plymouth…..placed recut granite and replaced granite on sand

4th Avenue N - 2nd Street to Omaha ROY …… placed recut granite and replaced granite on sand

3rd Street N - 3rd Avenue N to 3th Ave S……replaced asphalt with 3.5" creosote block

1922 annual reports

See Table 5 on page 98 for new pavements in 1922

1st Street N - 3rd Avenue to Plymouth…..placed recut granite and replaced granite on sand….same project as in 1921

- (1891) granite on sand
- (1906) sandstone on sand

- (1915) sandstone on sand
- (1922) granite on concrete

2nd Street N - Hennepin Avenue to 1st Avenue N.....recut granite on concrete from granite on sand

1st Avenue N - Washington Ave to 7th Street

- (1904) sandstone on sand
- (1914) Asphalt resurface
- (1922) 3.5" wood block

2nd Avenue N - 5th Street N to 7th Street N

- (1901) 6th to 7th street - brick
- (1904) 5th to 6th street - brick
- (1922) 4" brick

1923 annual reports

See Table 8 on page 184 for new pavements in 1923

5th Street N - 1st Avenue N to Hennepin Avenue.....3.5" creosote block from (1896) asphalt on concrete base

5th Street N - Washington Ave to RR bridge..... 3.5" creosote block from (1904) sandstone on sand

2nd Street N - 1st Avenue N to RR Bridge.....recut granite from (1905) sandstone on concrete

1924 annual reports

See Table on page 14 for new pavements in 1924

No significant pavement replacement in project area

1925 annual reports

See Table on page 108 for new pavements in 1925

2nd Avenue N – 7th Street N to 8th Street N .....creosote block and brick

2nd Street N – 715' north of 5th Avenue to 1515' north of 5th Avenue.....granite

1926 annual reports

See Table on page 196 for new pavements in 1926

4th Street N – Bridge over tracks to 6th Avenue N.....4" brick to replace (1910) sandstone block

5th Avenue N – 4th Street N to 5th Street N.....4" brick

5th Avenue N – 2nd Street N to alley between 2nd Street and Washington Avenue.....4' brick to replace (1903) sandstone blocks

6th Avenue N – Washington Avenue to 5th Street N.....4" brick to replace (1911) sandstone blocks

Alley bet. 11th av S and 12th av S	36th st	37th st	7" concrete		12.0	12.0	2.52	2.52	244.8	330.7	833.47	771.70
Alley bet. Lake st and 31st st	Bloomington av	15th av S	7" concrete		12.0	12.0		2.86	278.8	378.1	1,000.36	*1,001.29
Alley bet. Humboldt av S and Irving av S	26th st	27th st	7" concrete		14.1	14.0	2.63	2.63	684.9	1,082.8	2,843.42	2,721.15
Alley bet. 27th av S and 28th av S	Lake st	31st st	7" concrete		16.5	16.0	2.64	2.64	489.4	911.5	2,401.49	2,292.22
Alley bet. 29th av S and 30th av S	Lake st	End of alley	7" concrete		16.6	16.0	2.79	2.69	354.4	653.7	1,757.01	1,725.43
Alley bet. Minnehaha av and 34th av S	37th st	34th av S	7" concrete		14.0	14.0	2.79	2.70	541.4	845.4	2,281.00	2,155.89
Alley bet. 44th av S and 45th av S (i)	34th st	35th st	7" concrete								**295.00	2,548.88
Broadway st N E (a)	Johnson st	Wilson st	4" brick	No. 1,235—20 yrs.	38.0	40.0		5.24	1,436.3	6,405.5	28,617.53	
4th st N	Bridge over tracks	6th av N	4" brick	No. 1,320—20 yrs.	36 & 42.5	36 & 42.5		4.13	686.3	3,377.9	13,959.23	
4th st S E (b)	Central av	2nd av S E	4" brick		10.0	50.0	6.67	6.71	364.5	435.9	2,926.12	2,592.00
4th st S E and Oak st (c)	15th av S E	University av	Creosoted blocks	No. 1,191—20 yrs.	3.0					495.9	4,079.92	
5th av N	4th st	5th st	4" brick	No. 1,236—20 yrs.	48.0	50.0		4.36	349.6	1,871.7	8,164.08	
5th av N	2nd st	Alley bet. Wash. and 2nd st	4" brick		50.0	50.0	5.13	5.13	143.3	909.9	4,668.59	4,617.00
15th st N	Laurel av	Hawthorne av	3" brick		30.0	32.0	3.60	3.60	305.1	1,022.7	3,681.70	3,600.00
41st st E	42nd av S	46th av S	3" brick	No. 1,414—20 yrs.	19.6	40.0		3.89	1,207.3	3,143.5	12,246.25	
43rd st W	Upton av	Vincent av	Asph. Con	No. 1,332—10 yrs.	39 & 28	30 & 41		2.87	365.5	1,395.3	3,998.73	
Hennepin av E	16th av S E	25th av S E	A. C. Re-Surf	No. 62—20 yrs.	25 & 40	40.0		2.37	2,340.8	9,573.5	22,880.40	
Hennepin av and Lyndale av (d)	Oak Grove st	Groveland av	4" brick		24.0	Indef.			603.0	1,579.6	11,700.41	
Hennepin av (e)	At Bridge Square		4" brick		83.0	Indef.	3.42	3.42	78.6	591.2	2,021.18	1,701.90
Holmes av	Lagoon av	Lake st	Asph. Con		30.0	32.0	2.15	2.15	272.4	857.5	1,839.96	1,809.36
Humboldt av N	26th av N	Lowry av	Asph. Con	No. 1,432—20 yrs.	30.0	32.0		2.21	2,565.4	8,932.8	19,744.86	
Lowry av N	Washington av N	River bridge	A. C. Re-Surf		41.0	40.0	1.85	1.85	1,426.8	6,559.1	12,157.94	10,226.09
Nicollet av (f)	48th st	50th st	Creosoted blocks	No. 679—20 yrs.	3.0					357.0	2,684.47	
Park av	14th st	28th st	A. C. Re-Surf		36.0	36.0	1.55	1.55	6,255.1	28,083.4	43,603.17	33,732.44
Pleasant av	26th st	Lake st	Asph. Con	No. 1,417—10 yrs.	28.0	30.0		2.30	2,396.4	7,839.5	17,979.87	
Riverside av	27th av S	Franklin av	Asph. Con	No. 1,425—20 yrs.	48.0	50.0		2.22	815.8	4,639.7	10,318.00	
Sheridan av	Lake Calhoun Blvd	W 40th st	Asph. Con	No. 1,362—10 yrs.	30.0	32.0		2.21	1,285.7	4,454.9	9,826.71	
2nd st S E	Central av	2nd av S E	4" brick		38.0	40.0	4.05	4.05	339.3	1,510.8	6,123.71	5,632.74
6th av N	Washington av N	5th st	4" brick	No. 1,489—20 yrs.	50.0	50.0		4.44	970.1	5,496.8	24,404.95	
10th st N	Hennepin av	Hawthorne av	3" brick	No. 1,456—20 yrs.	30.0	32.0		3.47	713.4	2,396.7	8,323.98	
10th st N (g)	Hennepin av	Angle bet. Hawthorne and 1st av N	4" brick	No. 1,310—20 yrs.	14.0	46.0			427.0	671.7	5,086.49	
13th av N E	River bridge	Ramsey st	4" brick re-surf		26 to 30	43.0	3.10	3.07	630.9	2,168.3	6,652.81	5,768.74
21st st W	Penn av	Thomas av	Asph. Con	No. 1,412—10 yrs.	30.0	32.0		2.15	1,379.8	5,126.3	11,926.57	
25th st E	Columbus av	Chicago av	Asph. Con		24.0	26.0	2.47	2.47	326.8	1,038.2	2,562.14	1,703.52
26th av S	29th st	Minnehaha av	Creosoted blocks	No. 1,305—20 yrs.	46.0	48.0		4.21	233.7	1,197.3	5,038.40	
31st st E	28th av S	Minnehaha av	Asph. Con	No. 1,413—10 yrs.	38.0	40.0		3.10	344.7	1,542.9	4,783.82	
38th av N	Penn av	Thomas av	3" brick	No. 1,314—20 yrs.	20.0	40.0		4.04	1,303.4	3,278.2	13,256.00	

1927 annual reports

See Table on page 286 for new pavements in 1927

5th Avenue N – 3rd Street N to 4th Street N.....4" brick

5th Street N – R RY Bridge to 6th Avenue N.....4" brick

TABLE NO. 7

PAVING LAID DURING THE SEASON OF 1927

STREET	FROM	TO	KIND	Elwell Law Number and Assessment Term	Width Paved by City —Feet	Width of Roadway—Feet	Rate of Assessment Per Sq. Yard	Cost Per Sq. Yard	Length Paved in Feet	Square Yards Paved by City	Cost of Paving Laid by City	Amount of Assessment
3rd av S	34th st E	38th st E	Asphaltic con	No. 1,482—10 yrs.	28.0	30.0	$2.70	$2.39	2,573.2	8,403.9	$20,084.98	13,389.98
Portland av	34th st E	38th st E	Asphaltic con	No. 1,488—10 yrs.	38.0	40.0	2.70	2.28	2,575.5	11,430.3	26,111.91	17,407.46
42nd st E	Cedar av	Minnehaha av	3" brick	No. 1,487—20 yrs.	38.0	40.0	4.00	3.79	7,192.0	21,146.5	80,225.26	53,483.50
Hoag av N	5th av N	6th av N	3" brick	No. 1,457—20 yrs.	34.0	36.0	4.00	3.99	350.6	1,393.8	5,566.43	3,710.94
University av N E	Lowry av N E	R. Ry. Bridge	3" brick	No. 1,469—20 yrs.	30.0	32.0	4.25	3.48	2,241.0	7,763.1	27,037.34	18,024.88
Girard av N	26th av N	Lowry av N	Asphaltic con	No. 1,561—10 yrs.	30.0	32.0	2.50	2.44	2,566.4	8,901.0	21,701.25	14,467.50
5th av N	3rd st N	4th st N	4" brick	No. 1,235—20 yrs.	48.0	50.0	4.00	4.73	320.3	1,791.9	8,750.45	5,833.62
5th st N E st 22nd av N E			Asphaltic con	No. 1,460			3.60	3.52	148.6	609.2	2,502.73	1,668.48
19th st S	Nicollet av	Hennepin av	3" brick	No. 1,310	10.0	45.0	8.16	8.15	709.2	1,178.5	9,619.61	6,413.06
28th av S	38th st E	42nd st E	3" brick	No. 1,094	3.4	40.0	2.33	2.33	2,715.0	1,025.7	2,384.55	1,589.70
Alley, Snyder & Co's 1st Add Blk 13	Marquette av	End	4" brick		16.0	16.0	4.76	4.89	324.4	576.7	2,819.86	2,622.71
Stevens av	24th st E	25th st E	2" asphaltic con		34.0	36.0	2.50	2.47	625.2	2,362.2	5,843.63	2,925.46
25th st E	Stevens av	3rd av S	2" asphaltic con		30.0	32.0	2.50	2.49	602.7	2,101.7	5,234.63	2,190.08
Hennepin av	25½ st W	26th st W	3" brick		5.0	50.0	7.42	8.16	268.5	165.5	1,350.09	1,228.05
Reservoir Blvd	850' N of 37th av N E	Reservoir	Mac. and 3" brick		11.0				4,909.1	5,950.9	47,717.38	47,717.38
					20.0	34.0	2.59	2.59	4,965.8	12,501.7		
5th st N	R. Ry. Bridge	6th av N	3" brick		38.0	52.0	4.50	3.46	602.1	3,026.5	10,469.57	
9th st S	Marquette av	4th av S	3" brick		10.0	50.0	8.51	8.51	1,028.2	1,227.1	10,441.51	8,908.20
Huron av	Hennepin av	Lyndale av	3" brick		18.5	50.0		6.48	238.3	505.1	3,276.30	
31st st W	Hennepin av	Irving av S	Macadam		33.0	56.0	1.75	1.75	974.3	4,528.4	8,103.79	8,103.79
Elliot av	29th st E	Lake st E	2" asphaltic con		28.0	30.0	3.45	3.45	623.4	1,857.3	6,403.87	6,403.87
10th av S	29th st E	Lake st E	2" asphaltic con		30.0	32.0	3.08	3.08	605.1	2,604.5	8,019.77	5,346.50
29th st E	Elliot av	Alley bet. Elliot and Chicago	2" asphaltic con		28.0	28.0	2.64	2.64	138.5	447.9	1,182.53	1,182.53
Alley bet. 27th and 28th av S	40th st E	41st st E	7" concrete		14.3	14.0	2.62	2.62	626.1	1,003.2	2,633.22	2,155.05
Alley bet. 39th and 40th avs S	34th st E	35th st E	7" concrete		14.0	14.0	2.92	2.92	623.3	1,045.3	3,054.71	2,664.75
Alley bet. 46th and 47th avs S	33rd st E	34th st E	7" concrete		12.1	12.0	1.90	1.86	629.0	845.6	1,572.07	1,339.60
Alley bet. 31st and 32nd avs S	45th st E	46th st E	7" concrete		14.0	14.0	2.57	2.62	629.5	982.6	2,577.34	2,331.20
Alley bet. 44th and 45th avs S	35th st E	36th st E	7" concrete		14.0	14.0	2.60	2.59	627.1	975.9	2,526.64	2,413.26
Alley bet. 40th and 41st avs S	34th st E	35th st E	7" concrete		14.0	14.0	2.92	2.92	618.3	954.3	2,790.40	2,648.55

1928 annual reports

See Table on page 373 for new pavements in 1928

No significant pavement replacement in project area

1929 annual reports

See Table on page 12 for new pavements in 1929

6th Avenue N – Washington Avenue to Washington alley west.....3" brick

STREET	FROM	TO	KIND	WIDTH PAVED CITY FEET	WIDTH ROAD-WAY FEET	RATE ASSM'T SQ.YD.	COST PER SQ.YD.	LENGTH PAVED FEET	SQ.YDS. PAVED BY CITY	COST PAVING LAID BY CITY	AMOUNT ASSM'T
E. Bloomington Av.	½ way bet 42 & 43rd St.	M'haha E. Pkwy	3" Brick	13	44			4,651.6	6,204.4	25,827.36	* * *
E. W. Broadway	Penn Av. N.	W. City Limits	2" A.C.	16	56	5.50	5.50	3,367.5	7,386.6	40,658.05	37,682.40*
E. Chicago Av.	44th St. E.	M'haha Blvd.	3" Brick	35	52	3.50	3.50	4,248.4	15,863.1	55,528.09	46,372.37
Colfax Av.N.	Hawthorne Av.	Laurel Av.N.	7" Concrete	45	32	3.26	3.26	289.5	1,431.3	4,666.79	4,260.56
4th St. S.	5th Av. S.	8th Av.S.	3" Brick Resurf.	35	50	2.61	2.61	1,188.1	4,922.5	12,832.27	9,694.35
E. W. 44th St.	Upton Av.	France Av.	2" A.C.	34&40	36&40	2.31	2.31	3,619.3	15,138.8	34,902.40	26,079.60
E.E. 46th St.	M'haha Av.	46th Av.S.	2" A.C.	54	56	2.61	2.61	1,782.2	11,703.2	30,550.43	11,684.40
E. 10th St. S.	Nicollet Av.	Marquette Av.	3" Brick	14	54	9.10	9.10	332.6	580.5	5,282.69	3,157.40*
E. 28th Av. S.	E. 42nd St.	M'haha Blvd.	3" Brick	20	40	4.02	4.02	3,676.1	8,457.3	34,025.94	27,261.73
E. 34th Av. S.	M'haha Blvd.	51st St. E.	3" Brick	23	40	3.54	3.54	1,920.0	5,185.7	18,332.80	14,106.80
E. 36th St.	Lyndale Av.S.	Chicago Av.	2" A.C.	30	32	2.41	2.41	6,304.6	23,871.9	57,566.73	41,451.40
E. W. 39th St.	Richfield Av.	Chowen Av.S.	2" A.C.	30	32	3.57	3.57	3,316.7	12,603.5	45,022.02	34,823.74
E. Park Av.	34th St. E.	38th St. E.	2" A.C.	34	36	2.38	2.38	2,515.5	9,908.0	23,617.78	21,851.96
46th Av. S.	46th St. E.	Godfrey Road	3" Brick	36	40	3.53	3.53	448.5	2,206.6	7,787.49	Not Ass'd.
Lyndale Av. S.	Superior Av.	Vineland Place	3" Brick	54&56	54&56	2.09	3.70	1,101.0	7,157.7	26,453.69	5,064.82
E. 25th St. W.	Pleasant Av.	Lyndale Av.	2" A.C.	28	30	2.39	2.39	1,241.4	4,325.9	10,350.97	7,327.50
6th Av. N.	Washington Av.	Alley-West	3" Brick	50	50	4.18	4.18	166.1	975.2	4,080.09	3,994.33
E. University Av. S.E.	24th Av.	St. Marys Av.	3" Brick	27	70	4.70	4.70	1,508.2	5,358.7	25,209.50	21,854.52**
E. University Av. S.E.	St. Marys Av.	E. City Limits	3" Brick Resurf	54	70	3.42	3.42	2,833.8	18,166.7	62,065.98	52,510.52
		Total						44,511.1	161,447.6	$524,761.07	

Note:
* Widening
** Job Started in 1928 and Completed 1929.
*** To be completed 1930.
E. Elwell Jobs.

12

1930 annual reports

See Table on page 99 for new pavements in 1930

5th Street N – 6th Avenue N to 11th Avenue N……2” asphaltic concrete

5th Avenue N – Washington Avenue to 3rd Street N ……4” brick

STREET	FROM	TO	KIND	WIDTH PAVED BY CITY FEET	WIDTH ROAD-WAY FEET	RATE ASSMT SQ.YD.	COST PER SQ.YD.	LENGTH PAVED FEET	SQ.YDS. PAVED BY CITY	COST PAVING LAID BY CITY	AMOUNT ASSM'T	
Aldrich Av. S.	Lincoln Av.	Franklin Av.	2" A.C.	28.0	30.0	2.55	2.52	564.7	1760.9	4432.07	4760.00	
Aldrich Av. N.	2nd Av. N.	Glenwood Av.	3" Brick	30.0	32.0	5.31	5.31	165.5	564.4	2996.38	2799.30*	
E. Bloomington Av.	40th St. E.	½ way bet 42& 43 St.	2" A.C.mac	12.0	42.0	2.13	2.13	1589.5	7959.6	8613.41		
E. Bloomington Av.	½ way bet 42&43 St.	M'haha Blvd.	3" Brick	12.8	44.0	3.99	3.99	3651.5	5058.1	20181.02**		
Bryant Av.S.	Lincoln Av.	Douglas Av.	2" A.C.	34.0	36.0	2.55	2.37	659.8	2617.2	6204.96	5784.48	
E. Broadway St.N.E.	Mississippi River	Main St. N.E.	3" Brick	40.0	40.0	5.55	5.55	1247.2	6588.0	33330.39		
E. Broadway St.N.	Penn Av. N.	City Limits	2" A.C. (Widen)	9.2	56.0	5.55	5.55	155.9	170.0	943.28		
E. Bryant Av. S.	26th St. E.	29th St. E.	2" A.C.	28.0	30.0	2.16	2.16	1785.0	5689.4	12316.65		
Central Av. N.E.	13th Av. N.E.	18th Av.N.E.	2" A.C. (Resurf)	44.8	60.0	1.12	1.12	1822.1	9248.8	10320.58	9539.04*	
E. Cedar Lk Road	Penn Av.	Superior Av.	2" A.C.	32.0	34.0	2.56	2.56	2149.9	8245.2	21115.09		
Elliott Av. S.	28th St. E.	29th St. E.	2" A.C.	30.0	32.0	2.40	2.40	520.1	1730.7	4150.41	4072.00	
E. Elliott Av. S.	Franklin Av.	24th St. E.	2" A.C.	30.0 (34.0	32.0 36.0	2.27	2.27	1242.4 1573.3)	4461.3	10110.76		
Emerson Av. S.	Mt. Curve Av.	24th St. W.	2" A.C.	(24.0	30.0	2.41	2.41	1198.5)	9397.1	22642.06	18857.93*	
Emerson Av. N.	Lowry Av. N.	33rd Av. N.	3" Brick (Header)	3.4	43.0	3.84	3.84		259.1	995.14	472.80*	***
Elroy St.	Blaisdell Av.S.	Pleasant Av. S	3" Brick	30.0 (40.0	32.0 40.0	3.54	3.54	731.9 806.0)	2569.0	9093.00	6872.25*	
8th St. S.	11th Av. S.	15th Av. S.	2" A.C.	(30.0	32.0	2.24	2.24	764.2)	6517.7	14611.11	12015.37*	
11th St. N.	Glenwood Av.	Holden St.	3" Brick	30.0	32.0	4.15	4.16	311.8	1071.0	4458.60	4152.00	
1st Av. N.	12th St. N.	M.St.L.R.R.	3" Brick	30.0	32.0	3.95	3.95	442.1	1523.7	6017.35	5533.78	
5th	Washington Av.	3rd St. N.	3" Brick (Resurf)	35.0	50.0	2.93	2.93	322.4	1225.3	3591.85	3589.92	
E. 4th Av. S.	50th St.	3rd Av. S.	2" A.C.	14.0	30.0	2.15	2.15	1002.4	2170.1	4665.96		
E. 42nd Av. S.	42nd St.	46th St. E.	2" A.C.	30.0	32.0	2.27	2.27	2585.4	9006.6	2046.42		

1931 annual reports

See Table on page 9 for new pavements in 1931

No significant pavement replacement in project area

3rd Avenue N – 2nd Street N to 5th Street N……2” asphaltic concrete

3rd Avenue Bridge…..2” asphaltic concrete

1933 annual reports

See Table on page 17 for new pavements in 1933

1st Avenue N – Washington Avenue to 9th Street N……brick header with 2” asphaltic concrete

2nd Street N – 10th Avenue N to Broadaway……5’ brick gutter with 2” asphaltic concrete

1934 annual reports

See Table on page 92 for new pavements in 1934

No significant pavement replacement in project area

Best Practices in Relation to Historic Street Materials

Best practices involving the preservation and reparation of historic street materials including clay, wood, and granite pavers.

1. Identification of brick, granite or wood streets as contributing resources to historic infrastructure in Minneapolis. Many cities including New York City, Philadelphia, Rock Island, IL, and Portland have identified said materials as contributing, leading to maintenance and reparation plans and ultimate preservation.

2. Creation of a 'Historic Street Materials Plan' like that of Rock Island, IL. First streets containing historic street materials are identified, evaluated, and categorized in terms of preservation. Once streets with historic streets materials are categorized, a prioritization list for public and private entities is created and distrubued. Along with categorization, policies to ensure the preservation of the surface of category one and category two brick streets must be implemented.

3. With the completion of a Historic Street Materials Plan, City Council should approve a new maintenance budget to be specifically targeted for streets composed of clay, wood, or granite pavers. A certain percentage of the annual budget for street maintenance should be set-aside to remove patches and potholes, level surfaces and generally do surface improvements that would improve the rideability and appearance of brick streets.

Techniques and associated costs to properly remove, clean, and reset historic paving materials.

Remove.
The clay, wood, and granite pavers on all identified streets may be salvaged with varying degrees of success and loss due to age, wear, composition, and removal process. Every contractor contacted utilized mechanical equipment in the paver removal process.

Glacial Ridge (one of the best Paver companies in Minnesota) begins the process by handpulling a few pavers to examine the quality and strength of the pavers. If the bricks appear to have not too much moisture and/or deterioration, then Glacial Ridge will use a bobcat to lift and dump bricks. Next, workers clean the bricks before they are palletized. If the bricks appear fragile at the initial removal, GR will handpull the bricks. Al Lotthammer warns against reusing fragile bricks explaining that if the bricks are too fragile to remove with a machine, they likely will not hold up to the re-installation process of being mechanically repacked.

Glacial Ridge estimated that 60-80% of bricks are salvageable depending on the setting method used, the fragility of bricks, and the texture of said bricks.

Clean.

All for-profit contractors contacted by Ms. Lindberg said cleaning method was basically "clapping" the bricks together to clean off dirt and related debris. Glacial Ridge stated that cleaning the bricks becomes a cost function. If bricks need to be hand scraped, workers will use a putty knife to clean the joints. Texture on the side of the bricks adds a variable. Hand scraping becomes very expensive as the "scrapers" are paid common labor rate.

Reset
There are three basic systems that could be used for reconstructing the brick and cobbles streets, .drylaid over crushed stone base, drylaid over a bituminous base, and drylaid over a concrete base. The construction methods vary mostly in the type of base materials that are used. All of the systems will work, however, drylaid over crushed stone is best for historic pavers.

Maintenance issues, best care practices, and associated costs related to maintenance.

Repairs
"As mentioned earlier the streets can be repaired easily and cost effectively if the city trains crews to lay pavers the proper way. The beauty of utilizing a dry laid and stone base system is that repairs can be made easily. To repair dips in the paving a prost can be used to pull the pavers out of the street. A probst is a special tool from Germany made for pulling pavers. The tool costs approximately $200 and replacement blades can be purchased for $10."[1]

Snowplowing
"Several cities, including St. Paul and Duluth have used rubber blade attachments for snowplows to remove snow from brick streets and to minimize damage. Typically, the blades wear out and are not replaced. Apparently, the cobble and brick streets in St. Paul and Duluth have been plowed with normal snowplows for quite some time and deterioration is not that noticeable."[2] Glacial Ridge recommends that pavers be plowed with a floating blade (which does not have to be rubber).

Historic street pavers and the integration of stormwater management.

"From a stormwater management perspective, porous asphalt, porous concrete, and permeable pavers—all with the open-graded aggregate system—are techniques that can restore permeability and infiltration and provide large storm detention in a highly urban environment. Parking lots, alleyways, driveways, fire lanes, and parking lanes on streets are common examples of impervious flatscape areas that can instead be porous or permeable to reduce runoff. Communities can retrofit

[1] Dahlgren, Shardlow, and Uban, Inc. *Grand and St. Albans Sewer Separation Project. Ramsey and Crocus HIll Street Replacement Project.* Rep. St. Paul, 1993. Print.
[2] Dahlgren, Shardlow, and Uban, Inc. *Grand and St. Albans Sewer Separation Project. Ramsey and Crocus HIll Street Replacement Project.* Rep. St. Paul, 1993. Print.

these areas to help retain the economic benefits of developed land while reducing offsite impacts."[3]

Glacial Ridge stated that spacer units can be installed under historic pavers to assist with stormwater management, though one would not want to use spacers under historic pavers on vehicular lanes as this could open up joints.

In reference to storm water management, a water management analysis needs to be done to understand how much water needs to be handled, where is the inflow coming from (rooftop, immediate 100 ft., 800 ft.,), etc. before a solution can be designed.

Glacial Ridge suggested looking at three cities for stormwater management case studies:
1. West Union, IA – channeled water into rain gardens on Main Street;
2. Chicago, IL – Green Alleys program
3. Charles City, IA – used Federal Stimulus money on 6 to 8 blocks of pavers in residential area.

[3] "What I Learned in Paver School." by Michelle DeLaria. Stormwater; The Journal for Surface Water Quality Professionals May 2008. Northland NEMO. Northland Nonpoint Education for Municipal Officials. Web. 10 Jan. 2011. <http://northlandnemo.org/images/Stormwater%20Journal%20-%20What%20I%20Learned%20in%20Pavers%20School%20april%202008.pdf>.

1st Street N. looking south toward 4th Avenue N., 1920

Street Paving in the Minneapolis Warehouse Historic District: A Public Works Context, 1882-1936

Prepared for

Bonestroo

and the

City of Minneapolis
Community Planning and Economic Development Department

by

Carole S. Zellie
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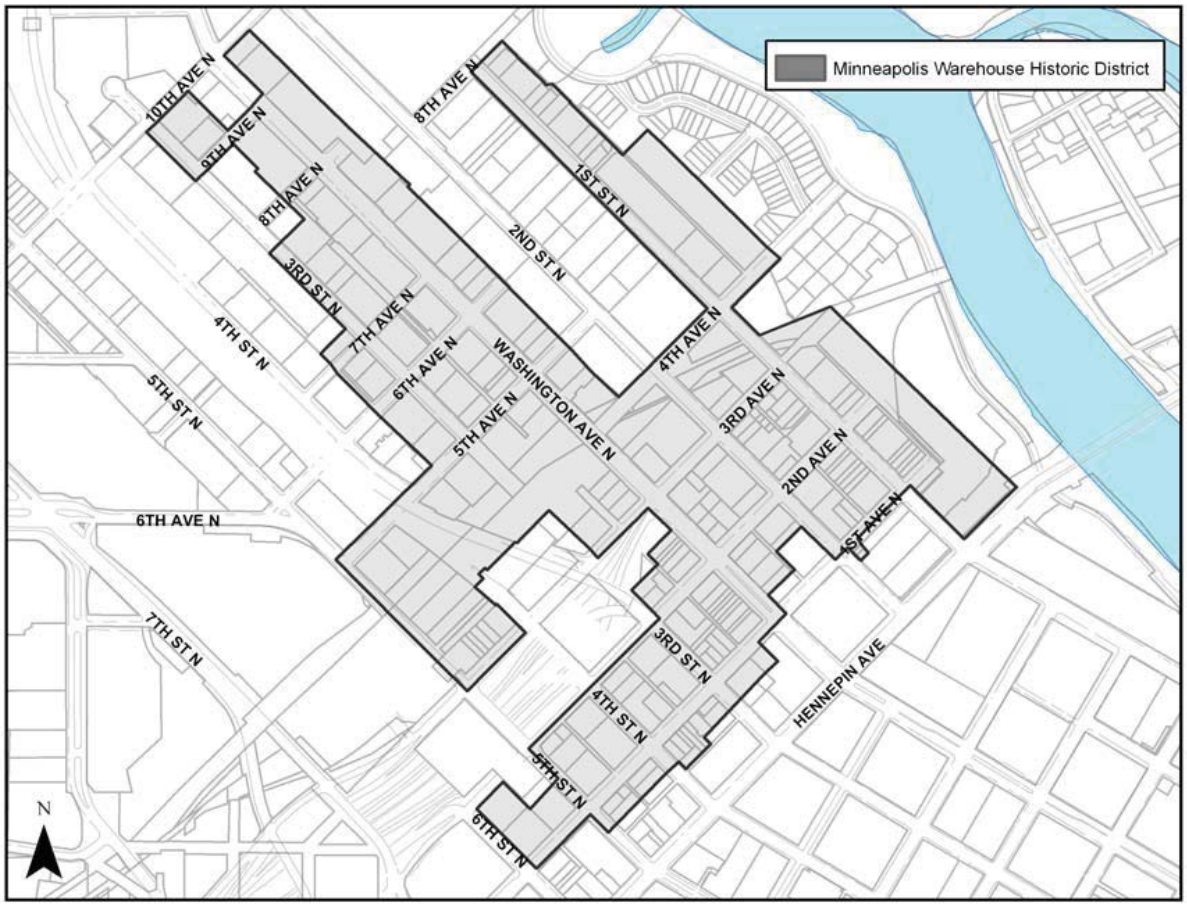
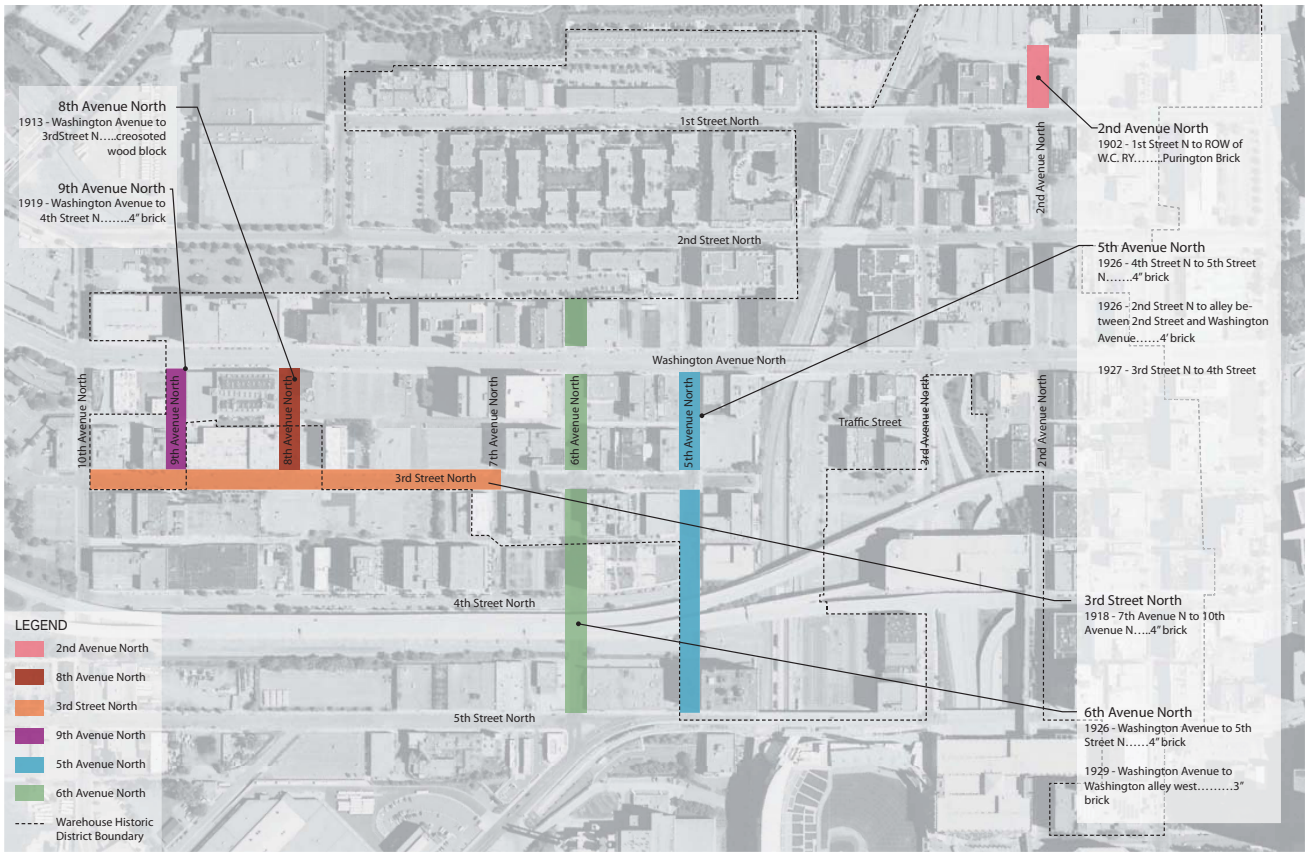


Fig. 1. Minneapolis Warehouse Historic District (City of Minneapolis)



Street Paving History
WAREHOUSE DISTRICT HERITAGE STREET PLAN

1.0 Introduction

> No problem of city life is more important, none more difficult of solution than that of the proper formation of our streets and roadways.
>
> *Minneapolis Tribune*, November 22, 1881, 1

> Few things are better indication of the growth of a place, or indicate the rapidity of the change from town to city more exactly, than the extent to which street paving is carried.
>
> "About Street Paving" *Minneapolis Tribune*, November 24, 1883, 7

This study provides a contextual background for the Minneapolis Warehouse District Heritage Street Plan and contributes to an understanding of the significance of the Warehouse Historic District's remaining historic wood, brick, and granite paving materials (Figures 1 and 2). An overview of the development of this area is provided in the *Minneapolis Warehouse Historic District Designation Study* (2009). The current study is a companion to the *Warehouse District Heritage Street Plan* (2011) prepared by Bonestroo for the City of Minneapolis.

The period of significance for the Warehouse District is from 1865 to 1936.[1] These dates span from construction of the earliest extant building, the Pacific Block at 224 Washington Avenue N., to the decline of the area during the Depression. The history of paving improvements within the district boundaries begins in the 1880s. Each decade of subsequent paving work reflects national planning and engineering trends as well as site, budget, and political conditions unique to Minneapolis. Concurrently, the Minneapolis City Engineer also oversaw extensive water, sewer and bridge improvements that underpinned the area. During its first decades, the area within the boundaries of today's district comprised retail businesses, dwellings, and churches as well as railyards, factories and shops. By 1900, once light-duty streets required upgrading to support the demands of increasingly heavy traffic.

2.0 Sources and Methods

Government documents, newspaper accounts, municipal engineering periodicals, historic photographs from the Minnesota Historical Society, and published histories provided information for this study. Annual reports and other statements prepared by the Minneapolis City Council and City Engineer were consulted for the years 1873-1940. Street paving locations, materials, and costs were detailed in the City Engineer's reports, which were often illustrated with tables and maps. The *Minneapolis Tribune* (1867-1908) and *Minneapolis Morning Tribune* (1909-1922) provided additional information and editorial opinion about paving progress as well as failure. Engineering periodicals such as *Paving and Municipal Engineering*, *Engineering Magazine*, and the *Journal of the Association of Engineers Society* sometimes discussed Minneapolis in case studies of paving materials and techniques. The literature review of public works history included

Carl Abbott, “Plank Roads and Wood-Block Pavements,” in *Journal of Forest History* (1981); Clay McShane,“Transforming the Use of Urban Space: A Look at the Revolution in Street Pavements, 1880-1924,” in *The Journal of Urban History* (1979) and *Down the Asphalt Path: the Automobile and the American City* (1994). Stanley Schultz and Clay McShane, “To Engineer the Metropolis: Sewers, Sanitation and City Planning in Late-Nineteenth-Century America,” in *The Journal of American History* (1978) was among other works consulted.

John Slack of Bonestroo reviewed and analyzed Minneapolis City Engineer’s annual reports for the years 1889 through 1934. A summary of this information is included in the Appendix. Carole Zellie of Landscape Research LLC prepared the historic context report.

3.0 STREET PAVING IN THE MINNEAPOLIS WAREHOUSE HISTORIC DISTRICT: A PUBLIC WORKS CONTEXT, 1882-1960

3.1 Early Street Improvements and Paving in the Warehouse Historic District: 1882-1900

> With all our metropolitan pretensions and proportions we have not a rod of paved or macadamized street, our water system is grossly inadequate, and by its shortcomings a constant source of peril to the property and lies of our citizens, while, with trifling exceptions we are as destitute of a proper sewage system as the average frontier village.
>
> "A Word to Every Citizen," *Minneapolis Tribune*, October 11, 1881

Minneapolis grew impressively after the Civil War, and incrementally expanded its city boundaries across the Mississippi River after merger with St. Anthony in 1872. The flour and sawmills framing Saint Anthony Falls were at the center of the city's economic growth. Washington and 1st Avenues N. also grew as spines of a district south of the river that would form the heart of a railroad and warehouse district (Figures 2, 5-8). Economic expansion would require not only new streets and bridges, but design of an extensive water and sewer system on both sides of the Mississippi River. Selection of the best paving materials and techniques for the Minneapolis landscape and climate would be based on decades of research and much trial and error.

Fig. 3. Hennepin Avenue looking south toward Washington Avenue, 1875. Street railway tracks are laid on unpaved streets (MHS).

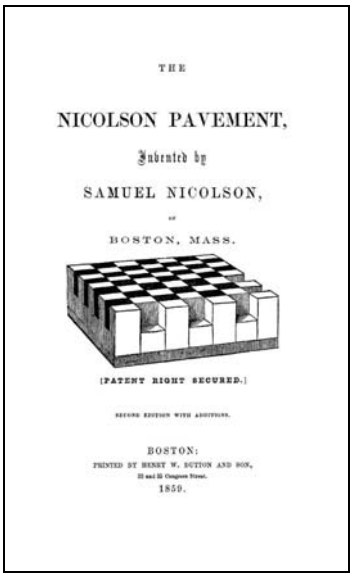
The city's first street grading project began in 1865 at Bridge Square at Hennepin and Nicollet Avenues. In 1873 the City of Minneapolis appointed H. H. Corson as the first City Engineer.[2] The Office of City Engineer was charged with all public works including streets, sewers, water and bridges.[3] The Street Division oversaw street surveying, grading, paving, sidewalks and curbs, and the creation of maps and profiles. Formal paving did not begin until 1882, however, when granite and cedar blocks were laid along a portion of Washington Avenue.[4] Despite the abundance of lumber, early street paving with pine planks, a practice popular in Wisconsin and Michigan, was apparently never adopted.

Many citizens complained about the condition of the city's business streets. The debate was carried on in daily newspapers and in City Council chambers. Articles in nationally syndicated newspapers regularly reviewed the pros and cons of various paving materials, and it was apparent that one city's success or failure would not necessarily be repeated elsewhere.[5] This was due to differences in topography, the availability of local materials and labor and, importantly, freeze-and-thaw cycles.

3.2 Many Paving Choices, Few Solutions

Early in 1882, on the eve of the city's first paving project, six types of paving materials were under consideration, including macadam, limestone block, granite block, Nicolson wood pavement, creosoted wood block, and asphalt blocks.[6] The merits of cedar versus granite blocks were most strenuously debated. Granite was durable, but it was expensive, noisy and caused heavy wear on horses and wagons. Treated or untreated wood—usually cedar—was praised for its cost and quiet surface suitable for residence areas, but it could be slippery and needed frequent replacement.[7] Macadam, composed of compacted gravel sometimes bound with oil, was cheap and suitable for pleasure drives and lightly used residential streets. Washington Avenue abutters petitioned in favor of cedar blocks, but City Engineer Andrew Rinker toured eastern cities and concluded, "wood should not be used at all."[8] The city's paving committee, on the other hand, visited Chicago and concluded that wood was suitable. By 1902, Rinker would completely reverse his opinion about wood paving.[9]

Municipal engineers placed great hope on the potential of wood block paving, whether pine, cedar, or other species. The method published in 1859 by Samuel Nicolson of Boston —the "Nicolson Paving"— utilized a relatively durable, inexpensive material that provided a quiet surface. The creosote-soaked pine was cut into blocks three to four inches wide, six to fourteen inches long, and six inches deep. They were laid together loosely on a sand foundation over one-inch planks coated with hot tar. The spaces were filled with tar and gravel. Nicolson's method was adopted by many cities, but patent infringement problems led to substitution of other methods such as the Boyington Paving first utilized in Chicago in 1868.[10]


THE

NICOLSON PAVEMENT,

Invented by

SAMUEL NICOLSON,

OF

BOSTON, MASS.

[PATENT RIGHT SECURED.]

BOSTON:

1859.

Fig. 4. Samuel Nicolson, The Nicolson Pavement (Boston 1859).

Wood paving, however, was slippery when wet, provided poor traction on steep grades, and harbored the potential for rot. Improvements included injection of creosote rather than soaking, and installation of blocks over a cement-concrete base.[11]

Minneapolis preferred cedar. In 1882, Washington Avenue was paved with cedar blocks from 3rd Avenue S. to 2nd Avenue N. Granite was laid between 8th and 3rd avenues S.[12] In 1883, cedar was installed on 1st Avenue N. from 1st Street to Washington Avenue, and along 2nd and 3rd avenues N. from 1st Street to Washington Avenue. Some alleys were concurrently paved in granite.[13]

In 1883, stone curbs and gutters were placed along 3rd Avenue from 2nd Street to 3rd Street N.; on 2nd Street from 3rd Avenue N. to 3rd Avenue S; and on 3rd Street from 4th Avenue N. to Sixth Avenue S.[14] Kettle River Sandstone and granite were initially used for curbing, with a small amount of limestone. Portland cement (then called "artificial stone") was adopted in 1887 and by constituted most of the city's curb material.[15]

By 1889 Minneapolis had 24 miles of paved streets. About 16 miles were in cylindrical cedar block laid on a plank bed, rammed with fine gravel and cemented with coal tar; four miles were granite, and one-half mile was asphalt.[16] Four years later, in 1893, 40 miles of paved streets included about 33 miles paved with cedar block. Two miles of Park Avenue, however, were asphalt-paved. By 1893, 33 of the city's 40 miles of paved streets were cedar block.[17] Most of the city's central business district streets were paved by 1894 in either cedar block or granite, despite continual discussions about the merit of other materials. Natural or artificial stone ("cement") sidewalks lined the streets in the business district; plank sidewalks also remained in use.[18]

Despite this progress, however, in 1894 the state of paving for the city's most-traveled streets was called a matter of "humiliation and discomfort." The contest next shifted from wood to asphalt versus vitrified brick.[19] In that year, four blocks of asphalt were laid on

Hennepin between Washington and 6th streets.[20] In the next year Wasatch Lime Rock Asphalt was laid on Nicollet Avenue, representing the first use of the material east of the Rockies.[21] City Engineer F. W. Cappelen and seven other city officials first made a nine-day trip to Salt Lake City to inspect that city's paving. [22] The material was based on Utah Wasatch lime rock. It was also composed of a matrix of 54 percent Pittsburgh flux, 32 percent pure asphaltum gum, 12 percent residuum oil and heated sand. When installed in Minneapolis, however, it failed during its first winter season, prompting the headline, "Asphalt Cracks."[23]

Until the standardization of specifications, which was achieved in the early 20th century, what was termed "asphalt" did not typically contain uniform ingredients. Asphalt consists of asphalt used to bind the material to aggregate (sand and gravel). It is laid down in layers and compacted. What was called asphalt in this period was later called asphalt concrete, while "concrete" referred to products containing Portland cement.

It should be noted that additional undercurrents in previous and future paving debates would come from the lobbies of lumber, asphalt and other paving material producers, as well as the influence of local contractors. Through the early twentieth century, the city's shift to its own labor pool, purchase of its own asphalt and concrete plants, and changes in taxation of local abutters would add to the equation.

3.3 New Hope with Vitrified Brick

> Vitrified brick, the new paving material, will soon be given a trial in this city, and should it prove a success, the day of cedar blocks will be over.
>
> "An Experiment in Paving," *Minneapolis Tribune*, April 2, 1892, 4

The significant amount of remaining brick paving in the Warehouse Historic District is testament to the popularity of this material between ca. 1895 and 1930. When wood pavers laid a decade before began to fail, brick was often employed for replacement. Beginning in 1892, vitrified brick was given a thorough discussion in the local press and Minneapolis City Council members visited St. Louis to assess the success of brick in that city.[24] In 1895 the material was tested on Bridge Square.[25]

In 1896, however, and despite poor results in previous attempts, city leaders endorsed asphalt for business streets.[26] Asphalt enjoyed support from nationally prominent engineers, including George Tillson, who published the influential *Street Pavements and Paving Materials* (1901), which concluded that asphalt was an ideal paving material by standards of cheapness, durability, ease of maintenance. It was not slippery for horse traffic and was favored by bicyclists.[27] The proposed use of asphalt adjacent to streetcar tracks was immediately protested by the Minneapolis Street Railway Company. The company claimed that the life of asphalt "depends upon an absolutely rigid foundation.[28] The city prevailed, but within six years all of the asphalt failed and had to be removed. The street railway company next installed a base of crushed rock under the ties, with the spaces filled with concrete. The 91-pound rails were spiked to the ties, and the spaces between the rails paved with granite blocks grouted with Portland cement.[29]

Fig. 5. 507 Washington Avenue N., 1919. Asphalt (?), granite curb, and granite block at street railway tracks (MHS).

3.4 Asphalt Woes

> Minneapolis is heartily sick of asphalt.
> *Minneapolis Tribune*, November 10, 1905 [30]

Asphalt was attractively cheap to install but performed poorly for downtown business streets. It also proved very costly to replace with other materials: because it was thinner than other materials, any change required extensive demolition including the concrete foundation, manholes, sidewalks, and curbs.[31]

In 1897 the *Minneapolis Tribune* reviewed an article about brick from the *Engineering Record*. The Minneapolis writer concluded that brick was superior to asphalt in the northern climate: "Anyone can see, by glancing at our asphalt pavement on the business streets, that is already covered with excoriations and seams and faults . . . it is certain that some sections look as if the pavement would not last many years."[32] The writer asked if brick paving had been given an adequate test in Minneapolis.

Plymouth Avenue N. was repaved with brick in 1897, and in 1900 Washington Avenue was resurfaced from 5th Avenue N. to Plymouth. Both streets previously had cedar block roadways. The brick obtained from the Purington Brick Company of Galesburg, Illinois was laid on a three-quarter inch layer of sand above a 6-inch bed of concrete. A new coating on the brick was tried, consisting of a thin layer of Portland cement intended to prevent chipping of the brick edges and also serving as a moisture barrier. A thin layer of sand was rolled on top of the brick.[33] This work also involved installation of water, gas, electric, and sewer connections and new streetcar tracks.[34]

By 1912, City Engineer Rinker declared that he would "advise against the use of asphalt paving." [35] In addition to the failure of the material, the city's contractors failed to properly install and maintain the paving. Asphalt, nevertheless, continued to be used for repairs and new installation and in 1913 Minneapolis purchased its own portable asphalt plant.[36] New asphalt paving in the Warehouse Historic District included 2nd Avenue N. between Washington and 2nd Street N.[37]

Although critiqued for poor performance, stone continued to be used for paving until well into the twentieth century. In 1897 Kettle River sandstone was laid along 1st Avenue N. from Washington to 4th Street, and on 3rd Avenue N. from 2nd to 3rd streets. In 1898, sandstone was laid on 3rd Avenue N. from 2nd Street N. to 3rd Street N. In 1904 it was placed on 5th Avenue N. between Washington Avenue and 2nd St. N., and in 1911 on 6th Avenue N. between Washington Avenue and 5th Street N.[38]

In 1913, granite was placed on 4th Avenue N. from 1st Street N. to 2nd Street N., and in 1916 it replaced sandstone on 2nd Avenue N. between Washington and 4th Street N.[39] Also in 1916 re-cut granite was used to replace sandstone laid on a sand foundation along 3rd Avenue N. from 1st St. to 2nd streets N. The granite was re-cut from stone laid elsewhere in 1883. The blocks were trimmed from their original five- to six-inch width and eight to ten-inch length to about five inches square. The joints were packed with Portland cement grout and an asphalt filler.[40]

Macadam, generally suited for light duty residential streets, was also installed in a few Warehouse Historic District locations, including that installed in 1902 on 8th Avenue N. from Washington to the Soo Line right-of-way.[41] Macadam was comprised of a graded soil roadbed with a three-inch crown to promote drainage. Two-inch (or smaller) crushed limestone was spread across the roadbed. The small aggregate ensured that the material would not get embedded in carriage wheels.

3.5 Creosoted Wood Block and Other Materials: 1902-1936

Following the repeated failure of asphalt, new developments in wood block paving made the City Engineer reconsider its use. A new generation of heavily creosoted blocks, rather than cedar, were believed to provide quiet and durable surfacing for the twentieth century. Introduced in Minneapolis 1902, they were laid on concrete rather than sand bases.[42] This was an improvement over previous practice, but in 1903 critics complained that some pavements were still being laid on native sand or mud, with poor results: "the money paid for labor and material . . . might as well be dumped in the river."[43]

By 1905, Minneapolis ranked third in the amount of creosoted block pavement in use, outranked only by Indianapolis and New York. In that year the U. S. Forest Service began a test of various types of wood paving on Minneapolis streets, making the city "the center of street paving interest in the country . . . in the future this city will be watched by every one interested in the important point of paving for modern streets."[44] The trial involved samples of creosoted Long leaf pine, Norway pine, Douglas fir, western larch, white birch, hemlock, and tamarack.[45] Cedar does not appear to have been tested. As the

main thoroughfare of the northern part of the city, Washington Avenue sometimes served as a laboratory for such early 20-century paving experiments. In 1909, City Engineer Rinker contributed an article to *Good Roads Magazine* explaining the benefits of properly creosoted blocks.[46] During this period civil engineers and other researchers conducted extensive tests on various paving materials. Forest-product scientists focused on improving wood block paving and tested performance of oils used for treating the wood blocks. Treatments including tannin and zinc-gypsum, kreodone oil, natural asphaltic oils from California and Mexico, and other creosoting oils of various types were debated, as well as the utility of various types of bases including concrete reinforced with steel wire.[47] Engineers proposed techniques such as corrugation and tightening with jackscrews to improve traction and safety for automobile traffic.

In 1912, the granite laid on Hennepin Avenue in 1883 was worn out and was replaced with creosoted wood blocks.[48] In 1916, after ten years of observing the U. S. Forest Service test results, it was reported that Longleaf pine had performed best, followed by white birch, eastern hemlock, tamarack, Norway pine, western larch, and Douglas fir.[49]

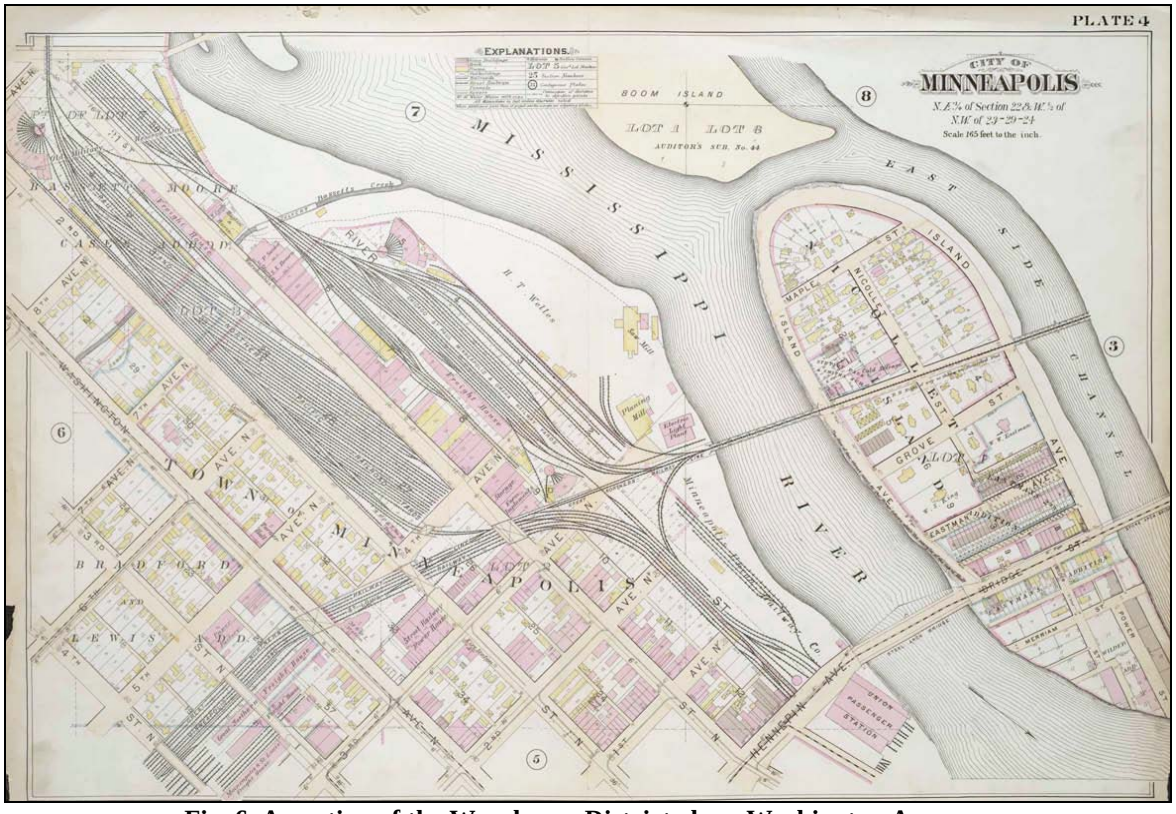


Fig. 6. A portion of the Warehouse District along Washington Avenue (C. M. Foote and Co., 1892, Plate 4).

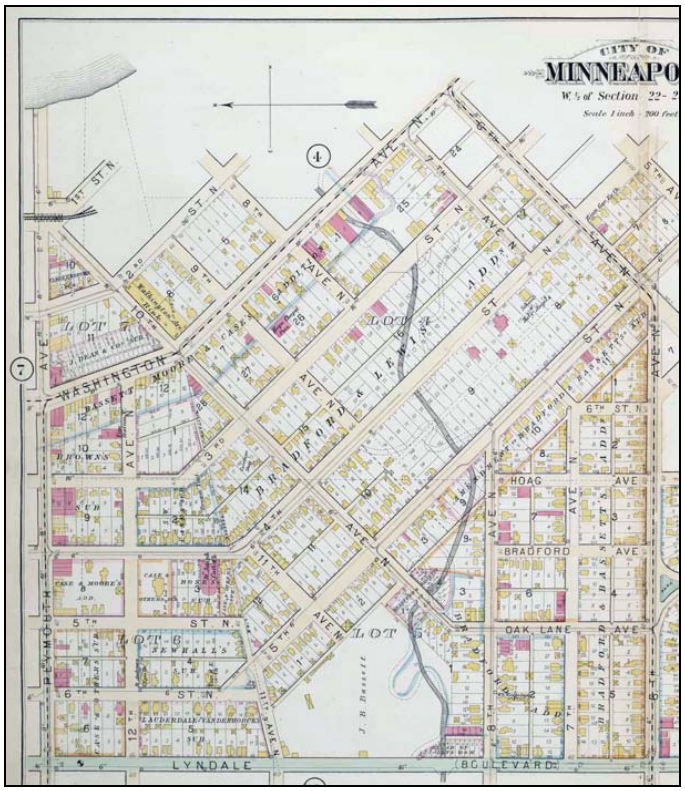


Fig. 7. A portion of the Warehouse District showing Bassett's Creek (C. M. Foote and Co., 1892, Plate 6).

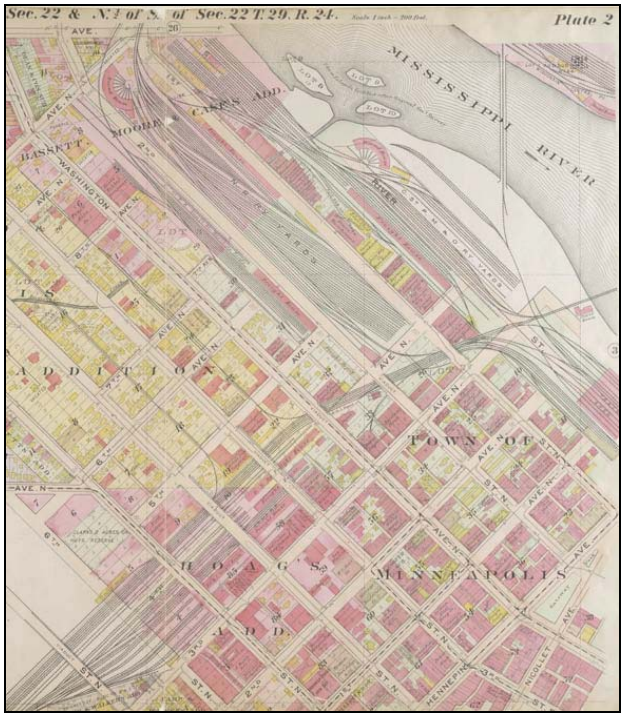


Fig. 8. A portion of the Warehouse District along Washington Ave. (Minneapolis Real Estate Board, 1915, Plate 2).

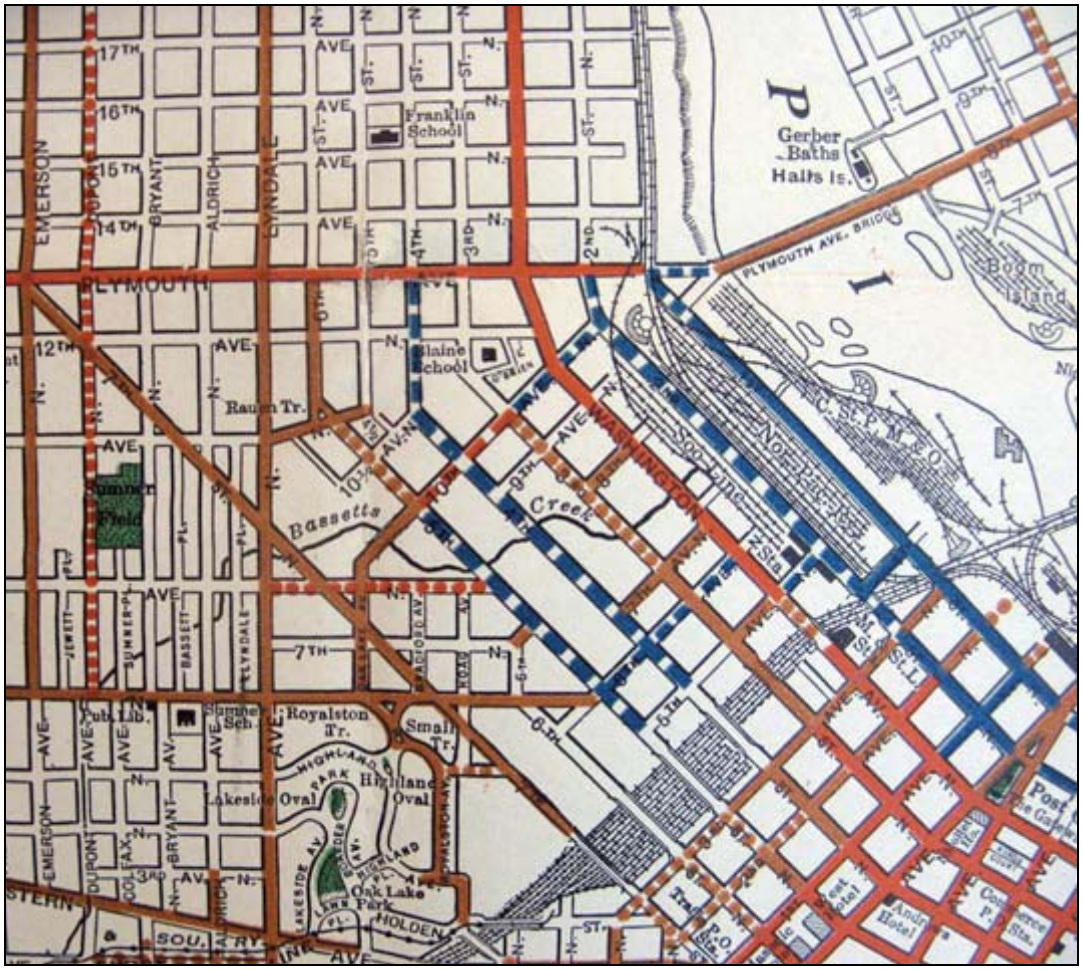


Fig. 9. Minneapolis Pavement Map (1917), from *Annual Report of the City Engineer of the City of Minneapolis,* 1916-17. Creosoted blocks, asphalt, brick, sandstone, and granite were in use.

By 1917, paving within the boundaries of the present-day Warehouse Historic District was a mix of creosoted blocks, asphalt, brick, sandstone and granite. Ambitious public works programs following World War I included street improvement programs intended to employ under- or unemployed municipal staff. A few sections of Portland concrete streets were poured in newly-developing areas of the city.[50]

In 1919, installation of 14 miles of new Minneapolis streets was accomplished with creosoted wood block, brick, concrete, asphaltic concrete, re-cut granite block and bituminous macadam.[51]

By the 1920s, most paving material was laid on a concrete foundation and in 1922 the city completed an asphalt and concrete plant at 1925 E. 26th Street. Wood-block paving was quiet, but with the sharp decline in horse-drawn traffic and tens of millions of rubber-tired automobiles, sound quality was no longer as important. The rising cost of lumber was also a consideration. Articles on wood-block paving "disappeared from the engineering literature after 1925," notes one historian.[52] New wood installation projects continued in Minneapolis through the 1920s, however, including one in 1923 along 5th Street N. from 1st Avenue N. to Hennepin Avenue.

Within the Warehouse Historic District, brick and re-cut granite also continued to be installed. In 1923, re-cut granite replaced sandstone on 2nd Street N. from 1st Avenue N. to the railroad bridge.[53] In 1930, 5th Avenue N. from Washington Avenue to 3rd Street N. was laid in brick.[54]

3.6 Concrete: 1913 and Beyond

Although concrete had been employed as a paving base since the turn of the century and had wide application to bridge and building construction, it was not employed for street surfacing in Minneapolis until about 1913.[55] Comprised of aggregate (sand and gravel), water, and Portland cement, the development of paving concrete relied on extensive study and experimentation with standardized specifications.[56] Concrete can support heavy loads with less deformation than asphalt and was used extensively for federal highway construction following the 1916 Federal-Aid Highway Act. During the Depression years of the 1930s, Works Progress Administration (WPA) and other federal programs aided Minneapolis street construction and repair. In 1947 the city's 298 miles of paved street included 190 miles of asphalt, 38 miles of brick, 31 miles of creosoted wood block, five miles of granite, and eleven miles of concrete.[57]

Concrete was also utilized for an extensive system of loading docks that served warehouse and factory buildings throughout the district.

Fig. 10. Wood block removal before asphalt paving, 3rd Street at 14th Avenue S., ca. 1940.

Extensive areas of brick and granite paving were covered over with asphalt following World War II. Wood block was apparently removed prior to resurfacing. Complete reconstruction of most Warehouse District streets was apparently not a priority, resulting in significant areas of brick paving, sections of granite and creosoted wood block, and granite curbing.

The rehabilitation and retrofitting of many Warehouse Historic District buildings began in the 1970s. Along with new construction, revitalization of the area has brought scrutiny to the survival and condition of historic paving materials and infrastructure such as loading docks. Brick, stone, and granite are among features that contribute texture and scale, as well as utility, to district significance and integrity.

3.7 Street Paving and the Public Realm

Street paving within the boundaries of the Warehouse Historic District followed the city's incremental progress toward creating its modern infrastructure. During the period 1882 to 1900, paving systems were still very experimental even as the city embraced two decades of unprecedented economic growth. City leaders understood that unpaved or poorly paved streets threatened the public health and progress of the city. In an era of increased knowledge of infectious disease, streets, sewers and water systems were the city's "lifelines" and the public sought a role in their design and upkeep.[58] Minnesota's harsh climate and freeze and thaw cycles were demanding. Granite, wood, and brick paving was originally designed for horses and horse-drawn conveyances, but the demands of automobiles, railroad, increasingly popular bicycles, and street railway construction required different materials and techniques. Smoothness, durability, and cheapness were prized qualities for all modes of travel.

Academically-trained civil engineers, serving as municipal employees and as consultants, enjoyed a key role as Minneapolis strove for excellence in public works and health. The Office of the City Engineer was charged with the construction of sewers, pavements, sidewalks, curbs and gutters, water mains, and bridges. Andrew Rinker (1849 -1918), a native of Philadelphia, supervised the early evolution of paving methods and oversaw a many of the city's important initial engineering efforts including the North Minneapolis Tunnel. Rinker was City Engineer from 1877 to 1893, and served again from 1902 to 1913. He is credited with laying 1 million square yards of pavement. [59] In 1889, he supervised the Street Division that included engineer I. E. Howe, an assistant engineer, a transitman, a superintendent of sidewalks, an assessment clerk, four levelmen, six rodmen, one draughtsman, and one clerk.[60]

Minneapolis consistently looked to other cities for comparative information. In 1881, Pittsburgh's paving experience was headlined as "Wood condemned, Asphalt Concrete Preferred for Suburban Streets and Granite Blocks recommended for Business Streets."[61] Among cities Minneapolis leaders looked to were London, Milwaukee, Pittsburgh, Detroit, and Chicago. A group of professional journals such as *Engineering News* printed frequent comparisons of street paving, water supply, sewer, and other improvements across many cities.[62]

> The paving question has been one of continual annoyance since the work was begun.
>
> "Paving Quarrel Continued," *Minneapolis Tribune* 29 May 1885, 3.

The choice of paving materials produced strong reactions from the public and provided topics for endless newspaper columns and editorials, in part because abutters were charged for improvements. One writer suggested that abutters inspect wood block work in progress, to verify "the foundation is solid and smooth; that the bricks and blocks are perfect, laid as closely as possible, and the necessary interstices thoroughly packed with gravel and tar."[63] Charles M. Loring (1833-1922) was particularly prominent in the campaign for good streets and endorsed creosoted wood laid on an arched concrete foundation.[64] Loring was the first president of the Minneapolis Board of Park Commissioners and his appointment as president of the American Park and Outdoor Art Society added to his already extensive travels. In 1899, after the Society's convention in Detroit, he pointed out the mistakes cities make "in paving with brick. They tried it in Detroit, and cannot be induced to put in any more. I rode over a street that was paved partly with asphalt and partly with brick. The first was as smooth as when first laid, the brick was as rough and noisy as is usually the case after a little use."[65]

In 1907, the Publicity Club of Minneapolis led the local launch of the nationwide City Beautiful movement. The City Beautiful gathered the support of many organizations including the Commercial Club and the Minneapolis Civic Commission, and its message included explanation of the importance of good roads. In 1910, many organizations supported creation of the *Plan of Minneapolis* by Chicago architect E. H. Bennett, which embodied the city's adherence to City Beautiful principles and relied on

an armature of wide, well-paved avenues.[66] Within the boundaries of today's Warehouse Historic District, streets supported heavy truck and railroad traffic that supplied railyards, warehouses, factories, and many other commercial and industrial businesses.

3.8 Historic Paving in Historic Districts

Brick, granite, or cobblestone paving are contributing features of local and National Register of Historic Places (NRHP) historic districts in a number of American cities. (Refer to case studies of management in other cities).

In at least two cities, wood-block pavement is a primary theme of a district designation. Cleveland's Hessler Court adjacent to the Case Western Reserve University campus is a block-long, wood-paved street listed in the NRHP in 1975. It is also locally designated. The paving dates from ca. 1908-1916.[67]

In Chicago, the wood-block paved alley at 1535 North Street, between Astor and State streets, is part of the Gold Coast NRHP District. The 18-foot-wide, 530-foot-long alley is paved with creosoted blocks laid in 1909. [68] The alley was individually listed in the NRHP in 2002 because it "represents an important development in city planning and transportation" and because it is exemplary of the long-term and widespread use of wood construction illustrating the importance of the lumber industry to the physical development of the city."[69]

Additional:

(Comment about especially undisturbed sections in Minneapolis district where stone curbs are also intact? Discuss wood block section? Also, survival of manhole covers? Typically, a context study might state more explicitly how the paving contributes to the area.) [70]

Fig. 11. 1st Avenue N. from 4th Street looking north toward Washington Avenue and the river, ca. 1905. Cedar block or creosoted wood block paving is shown; brick pavers appear at right crosswalk (MHS).

Fig. 12. 4th Street from 1st Avenue N. to Hennepin Avenue, ca. 1905. Creosoted wood is likely material shown (MHS).

Fig. 13. Looking northwest on Washington Avenue from 5th avenue N., 1954. Asphalt paving is shown, with granite pavers along streetcar right-of-way (MHS).

3.9 Endnotes

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[2] Issac Atwater, *History of the City of Minneapolis, Minnesota*, vol 1 (New York: Munsell and Company, 1893), 92.
[3] "City Engineer's Report," *Annual Report of Various City Officers of the City of Minneapolis for 1889* (Minneapolis: Harrison and Smith), 1890.
[4] "About Street Paving," *Minneapolis Tribune*, 24 Nov 1883, 7.
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[6] "The Local Hopper," *Minneapolis Tribune* 29 Oct. 1881, 7.
[7] "Street Paving," *Minneapolis Tribune* 1 Feb 1882, 7.
[8] 'Cedar or Granite?" *Minneapolis Tribune* 7 April 1882,7; 23 March 1882, 7.
[9] Andrew Rinker, "Creosoted Wood Block Street Paving," *Good Roads Magazine* (April 1909), 272-273.
[10] Madeleine Metzler, "Wooden Alley," National Register of Historic Places Nomination Form, 2001, 8-11. Accessed as http://gis.hpa.state.il.us/hargis/PDFs/219000.pdf.
[11] David O. Whitten, "A Century of Parquet Pavements: Wood as a Paving Material in the United States and Abroad, 1840-1940. "*Essays in Economic and Business History* XV (1997), 209-226. Accessed as http://www.kaswell.com/historical/whitten_2b.htm.
[12] "Street Paving: Work on Washington Avenue to be Commenced July 15," *Minneapolis Tribune* 29 June 1882, 6.
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[14] "About Street Paving," 24 Nov 1883, 7.
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[16] "At the City Hall." *Minneapolis Tribune* 1 Jan. 1889, 5; 1889; "Engineer's Report,"*Annual Report of Various City Offices, 1890*, 110.
[17] Atwater, 416.
[18] Atwater, 416.
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[22] "Now for New Paving," *Minneapolis Tribune* 28 March 1895, 7.
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[24] "An Experiment in Paving," *Minneapolis Tribune* 2 April 1892, 4; "Pointers on Paving," *Minneapolis Tribune* 22 Nov 1893, 5.
[25] *Annual Report of the City Engineer of the City of Minneapolis*, 1895; 1896.
[26] "Asphalt is Bad: Hennepin Avenue Paving Will Not Quite Do," *Minneapolis Tribune* 29 Nov 1894:5; "Bobbed Up Again," *Minneapolis Tribune* 13 March 1896, 8.
[27]George W. Tillson, *Street Pavements & Paving Materials* (New York, 1901), 167.
[28] Department of Commerce and Labor, Bureau of the Census, *Street and Electric Railways, 1907* (Washington D.C.: Government Printing Office 1910), 228.
[29] Ibid., 228.
[30] "Making the Best of It," *Minneapolis Tribune* 10 Nov 1905, 4.
[31] "The Limitations of Asphalt Paving," *Minneapolis Tribune* 15 March 1906, 4.
[32]"Good Paving Specifications," *Minneapolis Tribune* 11 July 1897, 6.
[33] "A Fine Street," *Minneapolis Tribune* 29 July 1900, A12; 1897 and 1898 *Annual Report.*
[34] "A Fine Street," *Minneapolis Tribune* 29 July 1900, A12; "Joy in Plymouth Avenue," *Minneapolis Tribune* 23 July 1899, 2.
[35] "Asphalt Paving is Opposed," *Minneapolis Morning Tribune* 24 Feb 1912, 11.
[36] "Return to Asphalt," *Minneapolis Morning Tribune* 23 July 1913, 8.

[37] *Annual Report of the City Engineer of the City of Minneapolis*, 1913.
[38] *Annual Report of the City Engineer of the City of Minneapolis*, 1904; 1911.
[39] *Annual Report of the City Engineer of the City of Minneapolis*, 1913, Table No. 10; *Annual Report* 1916, 74.
[40] *Annual Report of the City Engineer of the City of Minneapolis*, 1916, 4.
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[47] Whitten, 1997.
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[50] *Annual Report of the City Engineer of the City of Minneapolis*, 1918, Table No. 6.
[51] "14 Miles of Paving Planned this Season, "*Minneapolis Tribune* 12 April 1919,10.
[52] Whitten, 1998.
[53] *Annual Report of the City Engineer of the City of Minneapolis*, 1923.
[54] *Annual Report of the City Engineer of the City of Minneapolis*, 1930.
[55] *Annual Report of the City Engineer of the City of Minneapolis*, 1913, Table No. 10.
[56] Bruce E. Seely, "The Scientific Mystique in Engineering: Highway Research at the Bureau of Public Roads, 1918-1940," in *The Engineer in America*, Terry S. Reynolds, ed. (Chicago: University of Chicago Press, 1991, 311).
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[58] Stanley K. Schultz and Clay McShane, "To Engineer the Metropolis: Sewers, Sanitation and City Planning in Late-Nineteenth-Century America" *Journal of American History*, vol. 65 (September 1978), 397.
[59]Andre Rinker obituary, *Minneapolis Tribune* 19 Mar 1918, 8. Rinker was engineer for the Great Falls (Montana) Townsite Company during the interim; see *Progressive Men of Montana* (Chicago: A. W. Bowen), 391. F. W. Cappelen succeeded Rinker and served until his death in 1918. Cappelen also served for one year in 1892. He was succeeded by N. W. Elsberg.
[60] *Annual Report*, 1890.
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[63] "Inspection of Paving by the Public," *Minneapolis Tribune* 19 Aug. 1904, 4.
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[67] Dianne Timblen, "History on the Road: Cleveland's Hessler Court," *Forest History Today* (Spring 2008), 55.
[68]Madeleine Metzler, "Wooden Alley," National Register of Historic Places Nomination Form, 2001, accessed as http://gis.hpa.state.il.us/hargis/PDFs/219000.pdf, 8-11.
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5.0 Appendix

Warehouse District and Minneapolis Paving Activity Summary
City Engineer's Annual Report, City of Minneapolis Annual Report
Compiled by John Slack ASLA, Bonestroo

1889 Annual Report - Since this is the first version, the city engineer sums up the street paving that has been done up to this point (past 8 years). There are 24 miles of paved streets and 4 done in this year - 80% are cedar block, 20% granite. The table that lists paved streets prior to 1889 is on page 120 and it identifies portion of street and material used, the 1889 table is on page 124.

1890 Annual Report – see table on page 118.

1891 Annual Report – see table on page 108.

1892 Annual Report – see table on page 116.

1893 Annual Report - City engineer describes that a discussion has begun on using brick for paving (page 116). At this point, 300 of 800 city streets are paved with 63 miles of cedar block, 2.8 of asphalt, 9.5 of granite, and 2 of macadam. He goes into the cost details of each, including the base. Granite was the most commonly used material for curbing. There is a discussion on page 120 about the City's success in abolishing railroad grade crossings. See paved street table, page 128.

1894 Annual Report - Apparently businesses in downtown pushed for brick to start being used and brick was ordered against the engineer's advice. His report goes into extensive detail about the types of brick, where they come from, and how much they cost. There is a MAP of paved streets by material type on page 144. See paved street table, page 146.

1895 Annual Report - The Downtown controversy is over - they used Utah Wasatch Limerock Asphalt on Nicollet Ave instead of brick. Minneapolis is the first city east of the Rockies to use this material. The city engineer wanted to test brick on one block of Washington between 2nd and 3rd Aves S but didn't end up occurring. The Council did take a trip to Des Moines to visit the Brick Makers Association and inspect 60 miles of that city's brick pavements, and thy were in good condition. The engineer finally tested the first brick on a strip 60 feet in length on Bridge Square over Great Northern Railway tracks. They used four types of brick. The test was a success and the engineer proposes using brick my commonly, particularly if it can be manufactured closer to home (page 123). See paved street table, page 166. A map is on page 167.

1896 Annual Report - Important year for paving, some old, dilapidated cedar block pavements finally removed and substituted with asphalt. Apparently cedar block only really is good for 5 years and asphalt has 10-year guarantee. This report points out the first ever pavement (1882) was granite on Washington south of 3rd Ave S and cedar block north of 3rd Ave S. All brick used so far in city comes from Des Moines. Page 119 has an interesting discussion on how tracks are laid in the streets and that they are a particularly a problem in the cedar block streets due to contraction and the need to fill the gaps with another material. Se paving table, page 160; map on page 161 shows a small stretch of brick in the North Loop (but not in the district).

1897 Annual Report - Not much paving, lack of money and uncertain of what material to use. Next brick street constructed in city - 7th St between Hennepin and 7th Ave S. More mention of Purington Brick Company out of Galesburg, IL. Businesses and property owners really like the brick, also bicyclists. Paving repairs are starting to be more of a problem - old cedar block in such bad condition that they

aren't being repaired but instead abandoned and covered with gravel - okay in the winter but a muddy best in summer. Now the city has started to use brick exclusively. See paving table and map, page 232.

1898 Annual Report - Bidding process to find a brick manufacturer are described on page 155. Contract let to Purington Company, lowest bidder and "furnishing, in my opinion, the best brick of all concerns bidding." City also trying Kettle River Sandstone blocks, laid in parts of North Loop - 1st Ave N. from Washington to 4th St and 3rd Ave N. from 2nd to 3rd Sts. See paving table, page 201. Another interesting table on page 205 of pavement removed and replaced by other pavement - first year this is inventoried.

1899 Annual Report Annual Report - Annual Report discusses the maintenance of different paving types found within the City. City Engineer has discussed the maintenance of different paving types with seven leading cities. These discussions regard the merit of each paving type but notes to give the tax payers their monies worth depends not only on the material but also the method of placement and treatment afterwards. Too much sprinkling and sweeping are detrimental to pavements and the “seven” department heads have all but condemned the sprinkling of asphalt paving.

See paved street table, page 181. Kettle sandstone pavers laid in lieu of cedar blocks on 3rd avenue n – from 2nd street n to 3rd street north. Remainder of block from fifth street to (175’ towards 4th street was laid with the same sandstone material. See page 197 of pavement removed and replacement chart. Washington Avenue replaced from 3rd Avenue S. to 3rd avenue N. from cedar block to asphalt.

This is the first year bicycle paths showed up in the engineer’s report.

1900 Annual Report - For the first time in the history of the city all of the paving, curb and gutter was done by day labor (city had to purchase equipment and find skilled laborers).

Engineer noted that Washington Avenue from 3rd Avenue N. to 5th avenue N. was to be paved with brick pavers in the upcoming year. Businesses in the area contributed money to intersections.

A large portion of Washington Avenue from 5th Avenue N. to 14th Avenue N. was repaved with brick from cedar block. Granite curb was also set as part of this project. See pavement removal and replacement chart, page 175. No paving map.

1901 Annual Report - Cost of pavement repairs in the city exceeded pavement repairs from the previous year. This excess was associated to brick pavements to the use of tar filler. This filler was adopted in place of cement filler at the request of property owners so that the street might be cured quickly in condition for travel. Tar filler would provide a more “elastic” condition that the cement filler and reduces the expense of replacing the pavement when tore up for subway work.

The following streets were recommended for replacement: Fifth avenue N. – 2nd street to Washington Avenue. Paving done in 1901 included: Washington Avenue N. – 5th Avenue intersection; Washington avenue N. - 3rd avenue to 4th and then 4th to 5th avenues including the bridge. See chart, page 169.

Paving removed and replaced includes Washington Avenue N – 5th Avenue intersection (cedar block to brick), Washington avenue N. - 3rd avenue to 4th avenues (brick) and 4th to 5th avenue (sandstone on concrete). See chart, page 171.

Chart on page 173 describes asphalt paving on Washington Avenue from 3rd Avenue S. to 3rd Avenue N. as being installed in 1896.

1902 Annual Reports - 1902 is the first mention of creosoted wood block paving materials. Also a wide variety of installation methods discussed: granite on sand or concrete, brick, sandstone on sand or concrete and Macadam with granite or limestone dressing.

Engineer identified issues with Macadam paving and considers the system a total failure and has expensive maintenance costs.

Paving chart on page 164 identifies new paving on 8th Avenue N. from Washington to the ROW of the SOO railroad: paved as macadam L. top.

Paving done on 2nd avenue N – 1st Street N to ROW of W.C. RY is Purington Brick.

TABLE No. 13.

Paving Done During the Season of 1902 and Assessed in the Taxes for the Year 1902.

All assessable property is assessed for the cost of the street on which the property abuts. The cost of paving all street intersections and parts along property exempt from special assessments is paid out of the permanent improvement fund, which is raised by general taxation. The paving is paid in five equal annual installments, with interest at five per cent per annum on all deferred payments. All work done by the city by day labor.

STREET.	From—	To—	Kind.	Width in Feet: Paved by St. Ry. Co.	Width in Feet: Paved by City.	Width in Feet: Roadway.	Rate of Assessment Per Sq. Yd.	Cost per Sq. yard.	Length Paved in Feet and 10ths.	Square yards Paved by: Street Railway Co.	Square yards Paved by: City.	Cost of Paving Laid by City.	Amount of Assessment.
Alley, Block 37	Town of Minn	eapolis	Purington Bl'k Bk.	.....	10.0	10.0	.....	2.69	55 4	.....	57.10	153.85	Money adv'c'd
Cedar av.	5th st.	7th st.	Purington Bl'k Bk.	15.1	34.9	50.0	2.10	2.19	832.3	1,399.98	3,878.67	8,503.48	4,938.01
Hennepin av.	10th st.	13th st	Sandstone on Con.	15.1	48.9	64.0	2 58	2.54	1,100.3	** 1,939.67	6,317.46	16 042.83	12,643.23
Hennepin av.	13th st.	Harmon Pl.	Sandstone on Con.	15.1	48.9	64.0	2.60	2.64	1,789.3	‡ 3,007.57	10,244.22	27,667.34	22,381.18
Main st. N. E.	Central av.	1st av. N. E.	Macadam Gr. Top.	.....	56.0	56.0	1.25	1.13	405.0	.....	2,609.36	2,943.36	2,847.48
Main st. N. E.	3rd av. N. E.	4th av. N. E.	Macadam L. Top.	.....	47.0 56.0	47.0 56.0	.96	96	612.0	.....	4,417.07	4,240.39	2,870.79
Marshall st. N. E.	4th av. N. E.	5th av. N. E.	Macadam Gr. Top.	.....	34.0	34.0	1 25	1.25	554.25	.....	2,274 87	2,848.14	2,803,74
Nicollet av.	13th st.	Grant St.	Purington Bl'k Bk.	....	50.0	50.0	.....	2.32	424.55	.....	2,369 73	5,493.86	Assess. in 1903
Univ. av. S. E.	7th av. S. E.	10th av. S. E.	Sandstone.	.....	40.0	40.0	1.96	1.91	1,309.7	.....	6,529.73	12,502.17	8,744.36
Univ. av. S. E.	10th av. S. E.	14th av. S. E.	Sandstone.	.....	40.0	40.0	1.96	1.94	1,332.7	.....	6,266.32	12,156.12	11,335.42
Western av.	N. Irving Av.	N. James av.	Purington Bl'k Bk.	15.1	28.9	42.0	2.10	2.37	299.2	501.99	859 63	2,035.78	1,815.03
1st av. N.	1st st.	R.of W.W.C.Ry	Purington Brick	.....	50.0	50.0	.....	.....	157.8	.....	988.60	.....	By W.C.Ry.Co.
1st av. N.	5th st.	6th st.	Sandstone	.....	50.0	50.0	1.86	1.91	341.3	.....	1,926.10	3,886.63	3,412.20
2nd av. N.	1st st.	R.of W.W.C.Ry	Purington Brick	.....	50.0	50 0	.....	.....	170.5	.....	947.23	.....	By W.C.Ry.Co.
2nd av. N.	Wash. av. N.	4t st.	Sandstone.	.....	50 0	50.0	1.86	1 87	682.0	.....	3,822 60	7,166.51	6,865.76
3rd av. N.	1st st.	2nd st.	Sandstone.	.....	50.0	50.0	1.86	1 81	333.5	.....	1,906.16	3 463.67	3,354.35
6th av. S.	Wash. av. S.	3rd st	Sandstone.	.....	50.0	50.0	1.86	1.86	331.15	.....	1,861 32	3,469.97	3,306.63
8th av. N.	Wash. av. N.	R.of W.Soo.Ry.	Macadam L. Top.	.....	40.0	40.0	.....	.....	166.0	.....	718.56	.....	Private Parties
10th av. S.	Wash. av. S.	3rd st	Purington Bl'k Bk.	.....	50.0	50.0	2.04	2.06	332.4	.....	2,275.37	4,694.30	4,475.23
10th st. S.	1st av. S.	Park av.	Creosoted Wood Bk	.....	39.0 40.0	39.0 40.0	2.79	2.79	3,145.95	¶ 262.80	13,304.69	37.120.08	26,343.47
20th av. N.	Miss. R. Bdge.	Wash. av.	Sandstone.	.....	64.0	64.0	1.82	1.82	1,183.0	.....	8,666.11	15,772.32	12,822.91
20th av. N.	Wash. Av. N.	4th st.	Sandstone on Con.	15.1	40.9 48.9	56.0 64.0	2.60	2 63	739 85	† 1,247.07	3,924.87	10,320.62	8,450,69
20th av. N.	4th st.	N. Lyndale av.	Sandstone.	15.1	40.9	56.0	1 90	‡	857.4	§ 1,357.40	‡ 2,477.80	7,926.38	6,118.90
Totals									17,155.55	9,716.48	88,643 57	187,597.80	$145,529.38
												6,805.33	Cost in 1903
												180,792 47	Net cost of Paving in 1902

.8475 miles of creosoted wood block.
.2959 miles of granite on concrete.
1.4814 miles of sandstone on concrete.
2.1121 miles of sandstone on sand.
.8381 miles of Brick.
.3083 miles of macadam (granite top).
.3242 miles of macadam (limestone top).

6.2075 miles of average 27 ft. roadway.

*Not finished
**Granite.
‡In this amount 805.24 sq. yards sandstone, 2202.33 sq. yards is granite.
†In this amount 55.17 sq. yards granite, 1191.90 sq. yards sandstone.
‡Not yet finished (to be in 1903).
¶Of this amount namely 262.8 sq. yards, 120.94 sq. yards is creosote block balance or 141.86 sq. yards is granite.
§Of this amount 348.6 sq. yards is Granite balance 1008.8 sq. yards sandstone.

1903 Annual Reports - No text descriptions of paving.

Paving done on 4th Avenue N. – 1st street N. to 2nd street N.: sandstone on sand.

Paving on 5th Avenue N. – 2nd Street N. to ½ way to Washington Ave.: sandstone on sand.

1904 Annual Reports - Paving on 5th Avenue N.: –Washington to ½ way at 2nd street N.: sandstone on sand.

1905 Annual Reports – No significant projects.

1906 Annual Reports - Pavement map on page 36 of engineer's report.

Paving on 10th avenue N. –Washington Avenue to 2nd Street N.: cedar block to sandstone on sand, and Washington Avenue to 3rd Street N.: cedar wood block to sandstone on concrete.

Engineer's report provided report on cooperative comparative test of different woods for creosoted block paving: test was on Nicollet Avenue between Washington Avenue and 1st Street N.

See scanned maps and documents.

1907 annual reports - Pavement map on page 35 of engineer's report.

No significant pavement replacement in project area.

1908 Annual Reports - Pavement map on page 8E.

Documentation in annual report of more creosote wood pavement usage throughout the City.

No significant pavement replacement in project area.

1909 Annual Reports - Pavement map on page 14E.

No significant pavement replacement in project area.

1910 Annual Report - Pavement Map on Page 14e.

Only significant pavement repair/ replacement in the project area along 3rd Avenue N – 2nd Street n to 4th Street N.: pavement replaced was creosoted southern pine from sandstone.

Annual report paving replacement chart found on 16e identifies 85% of all pavement replacement within streets was with creosoted wood blocks. Brick was the primary material used for alleys.

1911 Annual Reports - Pavement map found on page 16e.

Pavement chart found on page 18e.

6th Avenue N – Washington Avenue to 5th Street N.: sandstone on sand.

5th Avenue N – Washington Avenue to 3rd Street N.: creosoted block.

3rd Street N – 3rd Avenue N to 6th Avenue N.: creosoted block.

1912 Annual Reports - Pavement map found on page 8e.

3rd Street N –6th Avenue N. to 7th Avenue N.: creosoted block.

7th Avenue N – Washington Avenue to 3rd Street N.: creosoted wood block.

1913 Annual Reports - During 1913 over 90,386 sf of 3.5" creosoted block was laid in the City and another 44, 857 4" creosoted block was laid. This was more than half of the 222,000 sf of pavement materials for the year.

During this year the City purchased the previous Railway portable asphalt plant and laid roughly 11,200 sf of asphalt on some of the major streets in the City (University Avenue, Plymouth Avenue, 1st Avenue N, 2nd Avenue N.

Creosoted wood block pavements – the wood used for the creosoted pavements was southern yellow pine (also called long leaf yellow pine). And was treated in Minneapolis utilizing standard specifications defined by the association of standardizing paving specifications; using 16 pounds of oil per cubic foot of wood.

See pavement map on page 8e.

8th avenue n – Washington Avenue to 3rd street N.: creosoted wood block.

3rd avenue n – 4th street N. to 5th street N.: creosoted wood block from sandstone on sand.

2nd avenue n – Washington Avenue to 2nd Street N.: asphalt.

4th avenue north – 1st street N. to 2nd Street N.: granite.

TABLE NO. 10.

PAVING DONE IN THE SEASON OF [illegible]

All assessable property is assessed for the cost of paving that part of the street on which the property abuts. [illegible] of the permanent improvement fund, which is raised by general taxation. The paving is paid [illegible] on all deferred payments. All work done by the city [illegible]

Street	From	To	Kind of Paving	Width Paved by St. Ry. Co. Feet	Width Paved by City Feet	Width Roadway Feet	[illegible] per square Yard	[illegible] per square Yard	[illegible]	[illegible]	[illegible]	Total [illegible]
Alley in blk 14, Harmons' add	12th st S	Lots 2 and 9	Creosoted wood		13.5	14	[illegible]	[illegible]			[illegible]	[illegible]
Alley bet. Clinton and 3d avs S	26th st	S line lot 11, blk 2, R. A. Davidson's	Concrete		12	12	1.55	[illegible]	[illegible]		[illegible]	[illegible]
Alley in blk 3, Hoag & Bells add	7th st N	End of alley	Brick		10	10	3.26	[illegible]	[illegible]		[illegible]	[illegible]
Alley in blk 12, Snyder & Co.'s 1st addition	10th st S	11th st S	Brick		12	12	2.57	[illegible]	[illegible]		[illegible]	1,171.10
Blaisdell av	24th st	25th st	Creosoted wood		28	30	2.57	2.56	[illegible]		[illegible]	[illegible]
Blaisdell av	Elroy st	Lake st	Creosoted wood		28	30	2.60	2.65	[illegible]		[illegible]	[illegible]
*Broadway st	Tyler st	Johnson st	Brick		38	40	.92	2.25	[illegible]		[illegible]	[illegible]
Calhoun blvd	Lake st	Dean blvd	Concrete		24	28	1.13	1.13	[illegible]		[illegible]	[illegible]
Chicago av	14th st	Franklin av	Creosoted wood	15.2	29.14	46	2.55	2.48	[illegible]	[illegible]	[illegible]	18,728.20
Clinton av	22d st	24th st	Creosoted wood		28	30	2.52	2.48	[illegible]		[illegible]	[illegible]
Excelsior av	Lake st	City limits	Concerete		16	40	1.40	1.38	[illegible]		[illegible]	[illegible]
8th st S	Nicollet av	Hennepin av	Creosoted wood		25.4	38	2.00	1.98	[illegible]		[illegible]	[illegible]
†8th av N	Washington av	3d st N	Creosoted wood		40	40	2.50	2.50	[illegible]		[illegible]	[illegible]
‡8th av N	Humboldt av	Elwood	Macadam		30	32		1.17				[illegible]
11th av N	Irving av	Knox av	Macadam		30	32	1.48	1.53	346		[illegible]	[illegible]
Farwell av	Sheridan av	Thomas av	Macadam		28	30	1.35	1.35	311		[illegible]	[illegible]
§1st av N	4th st	5th st–N ½	Asphalt		17.4	50		1.26	311		[illegible]	[illegible]
4th st N	20th av N	21st av N	Creosoted wood		30	32	2.50	2.53	389		[illegible]	[illegible]
§4th av N	1st st	2d st	Granite		20	50		1.43	290		[illegible]	[illegible]
14th av N	Oliver av	Penn av	Macadam		30	32	1.45	1.49	261		[illegible]	[illegible]
§42d av N	Bridge over river		Creosoted wood		31	36		1.66	1,372		[illegible]	[illegible]
Girard av N	Plymouth av	20th av N	Concrete		30	32	1.44	1.44	2,542		[illegible]	[illegible]
Hennepin av	10th st	15th st	Creosoted wood	15.2	48.8	64	2.25	2.25	1,828		[illegible]	[illegible]
Hennepin av	31st st	36th st	Creosoted wood		30	32	2.50	2.49	3,230		[illegible]	[illegible]
E Island av	Central av	N line lot 5 Nicollet Island	Creosoted wood		28	30	2.66	2.66	1,102		[illegible]	[illegible]
‡E Lake st	29th av S	River	Creosoted wood	15.2	3	50		2.45		[illegible]	[illegible]	[illegible]
Monroe st	Broadway st	15th av NE	Creosoted wood		30	30	2.35	2.37	1,590		[illegible]	[illegible]
¶19th av N	Thomas av	Xerxes av	Concrete		34	36	1.21	1.67	1,274		[illegible]	[illegible]
Oliver av N	Plymouth av	16th av N	Macadam		26	28	1.45	1.49	1,276		[illegible]	[illegible]
*Penn av N	Crystal Lake av	36th av N	Creosoted wood	15.2	20.8-32.8	38 & 50	2.60		3,432	[illegible]	[illegible]	[illegible]
■Penn av N	Crystal Lake av	19th av N	Concrete		30	32	.99	1.36	1,785		[illegible]	[illegible]
Pillsbury av	24th st	28th st	Creosoted wood		30	32	2.57	2.58	2,617		[illegible]	[illegible]
Pleasant st	University av	N. P. Ry	Creosoted wood		25 & 30	25 & 30		2.42	1,226		[illegible]	[illegible]
§Plymouth av	Bridge over river		Creosoted wood		34	34		1.86	935		[illegible]	[illegible]
§Plymouth av	Washington av	2d st N	Asphalt		42	42		.76	331		[illegible]	[illegible]
Richfield av	Calhoun blvd	39th st	Concrete		16	36	1.30	1.69	592		[illegible]	[illegible]
Sheridan av	10th av N	Farwell av	Macadam		30	32	1.35	1.35	106		[illegible]	[illegible]
Superior av	Hennepin av	Lyndale av	Creosoted wood		32	34	2.50	2.54	530		[illegible]	[illegible]
Superior av	Lyndale av	Bridge	Concrete		16	34	1.23	1.20	3,487		[illegible]	[illegible]
§Superior av	Brownie Lake	City limits	Concrete		16	34		1.50	[illegible]		[illegible]	[illegible]
§2d av N	Washington av	2d st N	Asphalt		50	50		.76	337		[illegible]	[illegible]
16th av N	Queen av N	Russell av	Macadam		30	32	1.66	1.66	330		[illegible]	[illegible]
3d av N	4th st N	5th st N	Creosoted wood		50	50	2.83	2.83	346		[illegible]	[illegible]
§3d st S	5th av S	7th av S	Asphalt		50	50		.68	658		[illegible]	[illegible]
10th av S	6th st	8th st	Creosoted wood	15.2	40 & 34.8	40 & 50	2.50	2.50	722	[illegible]	[illegible]	[illegible]
10th av N	Irving av	Knox av	Macadam		26	28	1.45	1.48	500		[illegible]	[illegible]
12th av N	Thomas av	Washburn av	Macadam		18	20	1.45	1.54	830		[illegible]	[illegible]
E 24th st	Clinton av	4th av S	Creosoted wood		28	30	2.52	2.46	272		[illegible]	[illegible]
E 26th st	Nicollet av	Park av	Creosoted wood		50&34,32 &32,34	50 & 34	2.38	2.37	3,087		[illegible]	[illegible]
§W 36th st	Hennepin	Lake Calhoun	Concrete		16			1.59	1,348		[illegible]	[illegible]
University av SE	Central av	1st av NE	Creosoted wood	5.1	50.9	56	2.35	2.35	105	[illegible]	[illegible]	[illegible]
§University av NE	1st av SE	3d av SE	Asphalt		40	40		.76	753		[illegible]	[illegible]
Upton av N	12th av N	Plymouth av	Macadam		28	30	1.53	1.54	482		[illegible]	[illegible]
Vincent av	12th av N	Plymouth av	Macadam		28	30	1.51	1.54	485		[illegible]	2,157.00
^Washington av	3d av S	12th av S	Creosoted wood	15.2	48.5	64	2.60	2.60	3,699		[illegible]	64,504.21
Western av	7th st N	Railway bridge	Creosoted wood	15.2	26.8	42	2.10	2.10	1,837		[illegible]	12,630.20
Total									[illegible]	[illegible]	[illegible]	$456,773.95

*$6,697.27 from good roads.
†To be assessed in 1914.
‡Assessed in 1912.
§No assessment.
¶$2,250 from good roads.
●To be finished in 1914.
■$2,033 from good roads.
^$19,975.7 [illegible] C. M. & St. P. Ry.

1914 annual reports

1915 annual reports

1916 annual reports

See Table on page 74 for new pavements in 1916.

2nd Ave N. – 1st Street N to 2nd Street N.: 4" creosote to replace (1904) sandstone on sand.

2nd Ave N. – Washington Avenue to 4th Street N.: 4" creosote to replace (1902) sandstone on sand.

3rd Avenue N. – 1st Street N to 2nd Street N.: granite to replace (1902) sandstone on sand.

Washington Avenue N.-- 3rd Avenue N to 24th Avenue N.: asphaltic concrete to replace (1901) brick from 3rd Avenue N. to 4th Avenue N. and (1900) from 8th Avenue N. to 14th Avenue N.

1917 annual reports

See Table on page 98 for new pavements in 1917.

4th Street N - 1st Avenue N. to 3rd Avenue N.: 4" creosote wood to replace sandstone on sand (1905).

1918 annual reports

See Table on page 74 for new pavements in 1918.

3rd Street N - 7th Avenue N. to 10th Avenue N.: 4" brick.

TABLE No. 6

PAVING LAID DURING THE SEASON OF 1918

STREET	FROM	TO	KIND	Width Paved by Street Railway Feet	Width Paved by City Feet	Width of Roadway Feet	Rate of Assessment Per Square Yard $	Cost Per Square Yard $	Length Paved in Feet	Square Yards Paved by Street Railway	Square Yards Paved by City	Cost of Paving Laid by City	Amount of Assessment
Alley in Aud. Sub. No. 30	12th st	Mary Place	3" Brick		20.0	20.0	3.01	$3.01	433.8		977.7	$2,941.51	$2,849.36
Alley bet. Emerson and Fremont	6th av N	11th av N	7" P. C. Concrete		16.0	16.0	2.25	2.31	1,614.5		2,858.2	6,454.90	6,178.80
Alley bet. Fremont and Girard	6th av N	11th av N	7" P. C. Concrete		16.0	16.0	2.25	2.14	1,644.3		2,912.5	6,077.49	6,374.20
Alley bet. Hennepin & Holmes	Lake st	31st st	7" P. C. Concrete		11.9	12.0	2.10	2.21	584.0		759.2	1,640.01	1,560.86
Alley bet. Humboldt & Irving	22nd st	24th st	7" P. C. Concrete		14.6	14.0		2.08	599.2		960.2	1,944.17	
Alley bet. Irving and James	28th st	29th st & James	7" P. C. Concrete		13.4	14.0	1.96	1.95	1,036.8		1,581.9	3,066.22	2,915.06
"A," "C," Cedar av	Lake st	38th st	3½"creosoted wood	15.2	22.8	40.0		2.91	5,259.7		13,063.7	37,982.83	25,113.87
"A," "C," Chicago av	24th st	Lake st	3½"creosoted wood	15.2	34.8	52.0		2.78	3,757.9		16,082.3	41,818.34	12,677.33
"B" Crystal Lake av	20th av N	26th av N	Asph.Con. Res'face		40.8	56.0							
					34.8	48.0	0.97	1.48	4,662.3		21,056.8	31,051.46	14,786.56
					32.8	40.0							
4th av S	28th st	Lake st	3½"creosoted wood	15.2	20.8	36.0	3.65	3.65	894.8	1,524.0	2,172.2	7,930.07	2,344.13
4th av S, widening	10th st S	22nd st E	4"creosoted wood		4.0	40.0	4.08	4.05			2,074.5	8,402.33	7,493.65
"C" 14th st W	Nicollet av	Willow st	3½"creosoted wood		30.3	32.0		2.67	854.9		2,983.8	7,960.37	7,087.54
First av NE	Univ. av NE	4th st NE	4" brick		9.8	40.0	3.15	3.86	339.9		367.0	1,415.51	1,353.00
Fifth av N	7th st	Royalston av	4" brick		34.0	36.0	2.93	2.98	414.1		1,858.4	5,533.10	4,618.54
"A" "C" Minnehaha av	Lake st	48th st	3½"creosoted wood	15.2	34.8	50.0		2.74	1,939.9		7,546.6	21,904.77	94,674.07
"A" 9th st S, widening	Hennepin av	Nicollet av	4"creosoted wood		29.6	51.0		3.20			2,835.7	9,070.51	
2nd av S	1st st S	Washington av	Granite		50.0	50.0	2.80	2.80	663.2		3,779.6	10,612.16	4,823.80
2nd st S	Marquette av	3rd av S	Granite		50.0	50.0	2.83	2.83	772.7		4,529.5	12,826.70	7,781.40
3rd av S	1st st S	2nd st S	4"creosoted wood		50.0	50.0	3.44	3.45	563.5		3,231.3	11,121.77	5,975.00
3rd st N	7th av N	10th av N	4" brick		50.3	52.3	2.94	2.94	1,455.2		8,556.8	25,136.06	20,905.11
10th av S	38th st E	40th N	7" P. C. concrete		30.0	32.0	Billed	3.05	37.5		125.0	381.37	
10th av SE	Como av	E Hennepin av	3" brick		21.0	40.0	3.01	3.00	1,248.1		2,665.8	8,223.75	5,639.4
"B" 20th av N	Lyndale av	Crystal Lake av	Asp.conc.Re'rface		40.8	56.0	0.97	1.48	2,525.1		11,961.4	17,638.42	9,577.97
23rd av NE	Filmore st	Johnson st	7" P. C. concrete		25.0	27.0	2.08	2.08	1,298.7		4,301.3	8,965.30	6,067.71
26th st E	Park av	Chicago av	3½"creosoted wood		32.0	34.0	3.44	3.44	572.3		2,230.1	7,671.00	6,080.77
"A," "C" 26th st W	Pillsbury av	Lake of the Isles	3½"creosoted wood		38.0	40.0							
					34.0	36.0		2.72	4,264.3		17,190.0	46,900.24	41,917.07
					32.0	32.0							
Washington av S	12th av S	Cedar av	3½"creosoted wood		48.8	64.0	2.82	2.82	1,327.0		8,045.8	22,670.52	16,365.03
"C" Yale Place	12th st S	Willow st	3½"creosoted wood		30.0	32.0	2.70	2.74	980.3		3,364.7	9,210.27	8,648.55

"A"—Ordered under the Elwell Law. "B"—One half of cost assessed by Resolution of Council "C"—Partly done in 1917,

1919 annual reports

See Table on page 79 for new pavements in 1919. See pavement map, page 22.

9th Avenue N.: Washington Avenue to 4th Street N.: 4" brick.

1st Street N – 1st Avenue N to 3rd Avenue N.: granite on concrete to replace (1885) granite on sand.

TABLE No. 6

PAVING LAID DURING THE SEASON OF 1919 AND ASSESSED IN TAXES OF 1919

STREET	FROM	TO	KIND	Width Paved by Street Railway Feet	Width Paved by City Feet	Width of Roadway Feet	Rate of Assessment Per Square Yard	Cost Per Square Yard	Length Paved in Feet	Square Yards Paved by Street Railway	Square Yards Paved by City	Cost of Paving Laid by City	Amount of Assessment
Alley Between	Park & Columbus	32st to 33st	Concrete		12.0	12.0	$2.64	$2.64	533.1		718.1	$1,895.8	$1,810.16
Alley between	Park & Oakland	32st to 33rd	Concrete		12.0	12.0	2.64	2.64	620.9		840.3	2,218.39	2,093.00
Cedar Av	48th st	52nd st	Concrete		36.0	40.0	1.78	1.78	2,742.5		10,922.8	19,396.25	8,817.41
(a) (d) Cedar av	38th st	48th st	3½" Creosoted wood		22.0	40.0	4 00	5.13	6,481.0		14,689.3	74,031.03	49,326.37
Central av	Main st	2nd st SE	3½ Creosoted wood		56.0	56.0	3.98	3.98	391.2		2,495.8	9,934.79	7,291 82
Emerson av	5th av N	Plymouth av	Asphaltic concrete		30.0	32.0	2.38	2.38	3,280.6		11,787.0	28,086.76	24,352.63
(b) (d) 8th av NE	2nd st NE	5th st NE	3½" creosoted wood		34.0	36.0	4.0		763.0		3,040.3	13,100.33	13,839.91
(b) (c) (d) (f) 8th st S	Henn. av	Nicollet av	3½" creosoted wood		22.2	48.0	3.00				1,356.3	3,844.64	13,277.70
18th av N	Wash. av N	2nd st N	Concrete		30.0	32.0	2.13	2.13	319 0		1,202.5	2,567.62	2,414.92
1st st	3rd av N	6th av S	Gran. on Concrete		Irregular	Irregular	3.20	3.18	3,303.0		16,440.4	52,190.19	43,276.27
1st av S	Grant st	22nd st	3½" creosoted wood		30.0 32.0	32.0	3.66	3.71	3,109.0		11,746.1	43,537.31	35,130.24
4th st	1st av N	4th av S	3½" creosoted wood	15.2	50.0 34.8 52.2	52.2 50.0	3.22	3.22	2,286.0		11,674.3	37,581.09	27,445.42
15th av NE	Quincy st	Jackson st	3½" creosoted wood		36.0 47.2	36.0	3.65	3.65	310.5		707.7	2,577.37	2,444.04
Hennepin av	Washington av	10th st	3½" creosoted wood	15.2	48.8 24.0	64.0 26.0	3.12	3.12	3,153.0		17,939.1	55 951.16	43,509.73
(b) (c) Humboldt av N	6th av N	Plymouth av	Concrete		34.0	36.0	2.30		1,963.8		5,834.0	12,165.36	11,630.00
Jackson st	15th av NE	15th av NE	3½" creosoted wood		38.0 16.0	38.0 16.0	3.65	3.65	147.4		572.8	2,083.08	1,864.27
Jewett Pl	6th av N	11th av N	Asphaltic concrete		22.0	24.0	2.73	2.73	1,688.6		3,877.6	10,556.74	9,813.25
(b) (d) Johnson st	Lowry av	29th av NE	3½" creosoted wood		19.0	40.0	4.00		2,000.0		4,740.3	20,545.09	19,303.33
(b) (c) (d) (f) Mary Place	8th st S	Vine Place	3½" creosoted wood		Irregular 40.0	50.0	3.00				4,261.4	14,611.96	37,563.00
9th av N	Washington av	4th st N	Brick		38.0 39.0 28.2	40.0	3.35	3.35	658.0		2,952.4	9,885.88	8,243.54
Oak st	Wash. av SE	Univ. av SE	3½" creosoted wood		38.3	43.5	3.92	3.92	666.0		2,011.6	7,881.78	5,032.61
Portland av	27th st	Lake st	3½" creosoted wood		38.0	40.0	3.67	3.67	1,804.0		7,844.7	28,752.59	23,661.90
(c) Plymouth av	Humboldt av	Penn av N	3½" creosoted wood	15.2	32.7 28.0	49.9 30.(	3.90	3.60	2,568.0		10,397.3	37,366.78	26,631.60
(b) Quincy st	Broadway	15th av NE	Brick		38.0	40.0	3.33		306.8		1,348.3	19,151.01	19,033.40

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1920 annual reports

See Table on page 15 for new pavements in 1920.

10th Avenue N – 3rd Street N to 5th Street N.: 4" VF brick to replace (1892) cedar block.

1921 annual reports

See Table 8 on page 16 for new pavements in 1921.

1st Street N. - 3rd Avenue to Plymouth: placed re-cut granite and replaced granite on sand.

4th Avenue N. - 2nd Street to Omaha ROW : placed re-cut granite and replaced granite on sand.

3rd Street N. - 3rd Avenue N. to 3th Ave S.: replaced asphalt with 3.5" creosote block.

1922 annual reports

See Table 5 on page 98 for new pavements in 1922.

1st Street N. - 3rd Avenue to Plymouth: placed re-cut granite and replaced granite on sand. Same project as in 1921:

- (1891) granite on sand
- (1906) sandstone on sand
- (1915) sandstone on sand
- (1922) granite on concrete

2nd Street N - Hennepin Avenue to 1st Avenue N.: re-cut granite on concrete from granite on sand

1st Avenue N - Washington Ave to 7th Street:

- (1904) sandstone on sand
- (1914) Asphalt resurface
- (1922) 3.5" wood block

2nd Avenue N - 5th Street N to 7th Street N:

- (1901) 6th to 7th street - brick
- (1904) 5th to 6th street - brick
- (1922) 4" brick

1923 annual reports

See Table 8 on page 184 for new pavements in 1923.

5th Street N. - 1st Avenue N to Hennepin Avenue: 3.5" creosote block from (1896) asphalt on concrete base.

5th Street N. - Washington Ave to RR bridge: 3.5" creosote block from (1904) sandstone on sand.

2nd Street N. - 1st Avenue N to RR Bridge: re-cut granite from (1905) sandstone on concrete.

1924 annual reports

See Table on page 14 for new pavements in 1924.

No significant pavement replacement in project area.

1925 annual reports

See Table on page 108 for new pavements in 1925.

2nd Avenue N – 7th Street N to 8th Street N.: creosote block and brick.

2nd Street N – 715' north of 5th Avenue to 1515' north of 5th Avenue: granite.

1926 annual reports

See Table on page 196 for new pavements in 1926.

4th Street N – Bridge over tracks to 6th Avenue N.: 4" brick to replace (1910) sandstone block.

5th Avenue N – 4th Street N to 5th Street N.: 4" brick.

5th Avenue N – 2nd Street N to alley between 2nd Street and Washington Avenue: 4' brick to replace (1903) sandstone blocks.

6th Avenue N – Washington Avenue to 5th Street N.: 4" brick to replace (1911) sandstone blocks.

Alley bet. 11th av S and 12th av S	36th st	37th st	7" concrete		12.0	12.0	2.52	2.52	244.8	330.7	833.47	771.76
Alley bet. Lake st and 31st st	Bloomington av	16th av S	7" concrete		12.0	12.0		2.96	278.8	378.1	1,000.35	*1,001.29
Alley bet. Humboldt av S and Irving av S	26th st	27th st	7" concrete		14.1	14.0	2.63	2.63	684.9	1,082.8	2,843.42	2,721.15
Alley bet. 27th av S and 28th av S	Lake st	31st st	7" concrete		16.5	16.0	2.64	2.64	489.4	911.5	2,401.49	2,292.22
Alley bet. 29th av S and 30th av S	Lake st	End of alley	7" concrete		16.6	16.0	2.79	2.69	354.4	653.7	1,757.01	1,725.43
Alley bet. Minnehaha av and 34th av S	37th st	34th av S	7" concrete		14.0	14.0	2.79	2.70	541.4	845.4	2,281.00	2,155.89
Alley bet. 44th av S and 45th av S (i)	34th st	35th st	7" concrete								**295.00	2,548.88
Broadway st N E (a)	Johnson st	Wilson st	4" brick	No. 1,235—20 yrs.	38.0	40.0		5.24	1,436.3	6,405.5	28,517.53	
4th st N	Bridge over tracks	6th av N	4" brick	No. 1,320—20 yrs.	36 & 42.5	36 & 42.5		4.13	686.3	3,377.9	13,959.23	
4th st S E (b)	Central av	2nd av S E	4" brick		10.0	50.0	6.67	6.71	364.5	435.9	2,926.12	2,592.00
4th st S E and Oak st (c)	15th av S E	University av	Creosoted blocks	No. 1,191—20 yrs.	3.0					465.9	4,079.92	
5th av N	4th st	5th st	4" brick	No. 1,236—20 yrs.	48.0	50.0		4.36	349.6	1,871.7	8,164.08	
5th av N	2nd st	Alley bet. Wash. and 2nd st	4" brick		50.0	50.0	5.13	5.13	143.3	909.9	4,668.59	4,617.00
15th st N	Laurel av	Hawthorne av	3" brick		30.0	32.0	3.60	3.60	305.1	1,022.7	3,681.70	3,600.00
41st st E	42nd av S	46th av S	3" brick	No. 1,414—20 yrs.	19.6	40.0		3.89	1,267.3	3,143.5	12,246.25	
43rd st W	Upton av	Vincent av	Asph. Con	No. 1,332—10 yrs.	39 & 28	30 & 41		2.87	365.5	1,395.3	3,998.73	
Hennepin av E	16th av S E	25th av S E	A. C. Re-Surf	No. 62—20 yrs.	25 & 40	40.0		2.37	2,340.8	9,573.5	22,680.40	
Hennepin av and Lyndale av (d)	Oak Grove st	Groveland av	4" brick		24.0	Indef.			603.0	1,579.6	11,700.41	
Hennepin av (e)	At Bridge Square		4" brick		83.0	Indef.	3.42	3.42	78.6	591.2	2,021.18	1,701.90
Holmes av	Lagoon av	Lake st	Asph. Con		30.0	32.0	2.15	2.15	272.4	857.5	1,839.96	1,809.36
Humboldt av N	26th av N	Lowry av	Asph. Con	No. 1,432—20 yrs.	30.0	32.0		2.21	2,565.4	8,932.8	19,744.86	
Lowry av N	Washington av N	River bridge	A. C. Re-Surf		41.0	40.0	1.85	1.85	1,426.8	6,559.1	12,157.94	10,226.09
Nicollet av (f)	48th st	50th st	Creosoted blocks	No. 679—20 yrs.	3.0					357.0	2,884.47	
Park av	14th st	28th st	A. C. Re-Surf		36.0	36.0	1.55	1.55	6,255.1	28,083.4	43,603.17	33,732.44
Pleasant av	26th st	Lake st	Asph. Con	No. 1,417—10 yrs.	28.0	30.0		2.30	2,396.4	7,839.5	17,979.87	
Riverside av	27th av S	Franklin av	Asph. Con	No. 1,425—20 yrs.	48.0	50.0		2.22	815.8	4,639.7	10,318.00	
Sheridan av	Lake Calhoun Blvd	W 40th st	Asph. Con	No. 1,362—10 yrs.	30.0	32.0		2.21	1,285.7	4,454.9	9,826.71	
2nd st S E	Central av	2nd av S E	4" brick		38.0	40.0	4.05	4.05	339.3	1,510.8	6,123.71	5,632.74
6th av N	Washington av N	5th st	4" brick	No. 1,489—20 yrs.	50.0	50.0		4.44	970.1	5,496.8	24,404.95	
16th st N	Hennepin av	Hawthorne av	3" brick	No. 1,456—20 yrs.	30.0	32.0		3.47	718.4	2,396.7	8,323.98	
10th st N (g)	Hennepin av	Angle bet. Hawthorne and 1st av N	4" brick	No. 1,310—20 yrs.	14.0	46.0			427.0	671.7	5,086.49	
13th av N E	River bridge	Ramsey st	4" brick re-surf		26 to 30	43.0	3.10	3.07	630.9	2,168.3	6,652.81	5,768.74
21st st W	Penn av	Thomas av	Asph. Con	No. 1,412—10 yrs.	30.0	32.0		2.15	1,379.8	5,126.3	11,026.57	
25th st E	Columbus av	Chicago av	Asph. Con		24.0	26.0	2.47	2.47	326.8	1,038.2	2,562.14	1,703.52
26th av S	29th st	Minnehaha av	Creosoted blocks	No. 1,305—20 yrs.	46.0	48.0		4.21	233.7	1,197.3	5,038.40	
31st st E	28th av S	Minnehaha av	Asph. Con	No. 1,413—10 yrs.	38.0	40.0		3.16	344.7	1,542.9	4,783.82	
38th av N	Penn av	Thomas av	3" brick	No. 1,314—20 yrs.	20.0	40.0		4.04	1,303.3	3,278.2	13,256.00	

1927 annual reports

See Table on page 286 for new pavements in 1927.

5th Avenue N – 3rd Street N. to 4th Street N.: 4" brick.

5th Street N – R RY Bridge to 6th Avenue N.: 4" brick.

TABLE NO. 7

PAVING LAID DURING THE SEASON OF 1927

STREET	FROM	TO	KIND	Elwell Law Number and Assessment Term	Width Paved by City —Feet	Width of Road-way—Feet	Rate of Assessment Per Sq. Yard	Cost Per Sq. Yard	Length Paved in Feet	Square Yards Paved by City	Cost of Paving Laid by City	Amount of Assessment
3rd av S	34th st E	38th st E	Asphaltic con	No. 1,482—10 yrs.	28.0	30.0	$2.70	$2.39	2,573.2	8,403.9	$20,084.98	13,389.98
Portland av	34th st E	38th st E	Asphaltic con	No. 1,468—10 yrs.	38.0	40.0	2.70	2.28	2,575.5	11,430.3	26,111.91	17,407.46
42nd st E	Cedar av	Minnehaha av	3" brick	No. 1,457—20 yrs.	38.0	40.0	4.00	3.79	7,192.0	21,146.5	80,225.26	53,483.50
Hoag av N	5th av N	6th av N	3" brick	No. 1,457—20 yrs.	34.0	36.0	4.00	3.99	350.6	1,393.8	5,566.43	3,710.94
University av N E	Lowry av N E	R. Ry. Bridge	3" brick	No. 1,469—20 yrs.	30.0	32.0	4.25	3.48	2,241.0	7,763.1	27,037.34	18,024.88
Girard av N	26th av N	Lowry av N	Asphaltic con	No. 1,561—10 yrs.	30.0	32.0	2.50	2.44	2,566.4	8,901.0	21,701.25	14,467.50
5th av N	3rd st N	4th st N	4" brick	No. 1,235—20 yrs.	48.0	50.0	4.00	4.73	320.3	1,791.6	8,750.45	5,833.62
5th st N E st 22nd av N E			Asphaltic con	No. 1,460			3.60	3.52	148.6	609.2	2,502.73	1,668.48
10th st S	Nicollet av	Hennepin av	3" brick	No. 1,310	10.0	45.0	8.16	8.16	709.2	1,178.5	9,619.61	6,413.06
28th av S	38th st E	42nd st E	3" brick	No. 1,094	3.4	40.0	2.33	2.33	2,715.0	1,025.7	2,384.55	1,589.70
Alley, Snyder & Co's 1st Add Blk 13	Marquette av	End	4" brick		16.0	16.0	4.76	4.89	324.4	576.7	2,819.86	2,622.71
Stevens av	24th st E	25th st E	2" asphaltic con		34.0	36.0	2.50	2.47	625.2	2,362.2	5,843.63	2,925.46
25th st E	Stevens av	3rd av S	2" asphaltic con		30.0	32.0	2.50	2.49	602.7	2,101.7	5,234.63	2,190.08
Hennepin av	25½ st W	26th st W	3" brick		5.0	50.0	7.42	8.16	268.5	155.5	1,350.09	1,228.05
Reservoir Blvd	850' N of 37th av N E	Reservoir	Mac. and 3" brick		11.0				4,909.1	5,950.9	47,717.38	47,717.38
					20.0	34.0	2.59	2.59	4,965 8	12,501.7		
5th st N	R. Ry. Bridge	6th av N	3" brick		38.0	52.0	4.50	3.46	602.1	3,026.5	10,469.57	
9th st S	Marquette av	4th av S	3" brick		10.0	50.0	8.51	8.51	1,028.2	1,227.1	10,441.51	8,908.20
Huron av	Hennepin av	Lyndale av	3" brick		18.5	50.0		6.48	238.3	505.1	3,276.30	
31st st W	Hennepin av	Irving av S	Macadam		33.0	56.0	1.75	1.75	974.3	4,628.4	8,103.79	8,103.79
Elliot av	29th st E	Lake st E	2" asphaltic con		28.0	30.0	3.45	3.45	623.4	1,857.3	6,403.87	6,403.87
10th av S	29th st E	Lake st E	2" asphaltic con		30.0	32.0	3.08	3.08	605.1	2,004.5	8,019.77	5,346.50
29th st E	Elliot av	Alley bet. Elliot and Chicago	2" asphaltic con		28.0	20.0	2.64	2.64	138.5	447.9	1,182.53	1,182.53
Alley bet. 27th and 28th av S	40th st E	41st st E	7" concrete		14.3	14.0	2.62	2.62	626 1	1,003.2	2,633.22	2,155.05
Alley bet. 39th and 40th avs S	34th st E	35th st E	7" concrete		14.0	14.0	2.92	2.92	623.3	1,045.3	3,054.71	2,664.75
Alley bet. 46th and 47th avs S	33rd st E	34th st E	7" concrete		12.1	12.0	1.90	1.86	629.0	845.6	1,572.07	1,339.60
Alley bet. 31st and 32nd avs S	45th st E	46th st E	7" concrete		14.0	14.0	2.57	2.62	629.5	982.6	2,577.34	2,331.20
Alley bet. 44th and 45th avs S	35th st E	36th st E	7" concrete		14.0	14.0	2.60	2.59	627.1	975.9	2,526.64	2,413.26
Alley bet. 40th and 41st avs S	33rd st E	34th st E	7" concrete		14.0	14.0	2.92	2.92	618.3	954.3	2,790.40	2,645.55

1928 annual reports

See Table on page 373 for new pavements in 1928.

No significant pavement replacement in project area.

1929 annual reports

See Table on page 12 for new pavements in 1929.

6th Avenue N – Washington Avenue to Washington alley west: 3" brick.

STREET	FROM	TO	KIND	WIDTH PAVED CITY FEET	WIDTH ROAD-WAY FEET	RATE ASSMT SQ.YD.	COST PER SQ.YD.	LENGTH PAVED FEET	SQ.YDS. PAVED BY CITY	COST PAVING LAID BY CITY	AMOUNT ASSM'T
E. Bloomington Av.	½ way bet 42 & 43rd St.	M'haha E. Pkwy	3" Brick	13	44			4,651.6	6,204.4	25,827.36	* * *
E. W. Broadway	Penn Av. N.	W. City Limits	2" A.C.	16	56	5.50	5.50	3,367.5	7,386.6	40,658.05	37,682.40*
E. Chicago Av.	44th St. E.	M'haha Blvd.	3" Brick	35	52	3.50	3.50	4,248.4	15,863.1	55,528.09	46,372.37
Colfax Av.N.	Hawthorne Av.	Laurel Av.N.	7" Concrete	45	32	3.26	3.26	289.5	1,431.3	4,666.79	4,260.56
4th St. S.	5th Av. S.	8th Av.S.	3" Brick Resurf.	35	50	2.61	2.61	1,188.1	4,922.5	12,832.27	9,694.35
E.W. 44th St.	Upton Av.	France Av.	2"A.C.	34&40	36&40	2.31	2.31	3,619.3	15,138.8	34,902.40	26,079.60
E.E. 46th St.	M'haha Av.	46th Av.S.	2" A.C.	54	56	2.61	2.61	1,782.2	11,703.2	30,550.43	11,684.40
E. 10th St. S.	Nicollet Av.	Marquette Av.	3" Brick	14	54	9.10	9.10	332.6	580.5	5,282.69	3,157.40*
E. 28th Av. S.	E. 42nd St.	M'haha Blvd.	3" Brick	20	40	4.02	4.02	3,676.1	8,457.3	34,025.94	27,261.73
E. 34th Av. S.	M'haha Blvd.	51st St. E.	3" Brick	23	40	3.54	3.54	1,920.0	5,185.7	18,332.80	14,106.80
E. 36th St.	Lyndale Av.S.	Chicago Av.	2" A.C.	30	32	2.41	2.41	6,304.6	23,871.9	57,566.73	41,451.40
E. W. 39th St.	Richfield Av.	Chowen Av.S.	2" A.C.	30	32	3.57	3.57	3,316.7	12,603.5	45,022.02	34,823.74
E. Park Av.	34th St. E.	38th St. E.	2" A.C.	34	36	2.38	2.38	2,515.5	9,908.0	23,617.78	21,851.96
46th Av. S.	46th St. E.	Godfrey Road	3" Brick	36	40	3.53	3.53	448.5	2,206.6	7,787.49	Not Ass'd.
Lyndale Av. S.	Superior Av.	Vineland Place	3" Brick	54&56	54&56	2.09	3.70	1,101.0	7,157.7	26,453.69	5,064.82
E. 25th St. W.	Pleasant Av.	Lyndale Av.	2" A.C.	28	30	2.39	2.39	1,241.4	4,325.9	10,350.97	7,327.50
6th Av. N.	Washington Av.	Alley-West	3" Brick	50	50	4.18	4.18	166.1	975.2	4,080.09	3,984.33
E. University Av. S.E.	24th Av.	St. Marys Av.	3" Brick	27	70	4.70	4.70	1,508.2	5,358.7	25,209.50	21,854.52**
E. University Av. S.E.	St. Marys Av.	E. City Limits	3" Brick Resurf	54	70	3.42	3.42	2,833.8	18,166.7	62,065.98	52,510.52
		Total						44,511.1	161,447.6	$524,761.07	

Note:
* Widening
** Job Started in 1928 and Completed 1929.
*** To be completed 1930.
E. Elwell Jobs.

12

1930 annual reports

See Table on page 99 for new pavements in 1930.

5th Street N – 6th Avenue N to 11th Avenue N.: 2" asphaltic concrete.

5th Avenue N – Washington Avenue to 3rd Street N.: 4" brick.

1930 con't

STREET	FROM	TO	KIND	WIDTH PAVED BY CITY FEET	WIDTH ROAD-WAY FEET	RATE ASSMT SQ.YD.	COST PER SQ.YD.	LENGTH PAVED FEET	SQ.YDS. PAVED BY CITY	COST PAVING LAID BY CITY	AMOUNT ASSM'T
Aldrich Av. S.	Lincoln Av.	Franklin Av.	2" A.C.	28.0	30.0	2.55	2.52	564.7	1760.9	4432.07	4760.00
Aldrich Av. N.	2nd Av. N.	Glenwood Av.	3" Brick	30.0	32.0	5.31	5.31	165.5	564.4	2996.38	2799.30*
E. Bloomington Av.	40th St. E.	½ way bet 42& 43 St.	2" A.C.mac	12.0	44.0	2.13	2.13	1589.5	7959.6	8613.41	
E. Bloomington Av.	½ way bet 42&43 St.	M'haha Blvd.	3" Brick	12.8	44.0	3.99	3.99	3651.5	5058.1	20181.02**	
Bryant Av.S.	Lincoln Av.	Douglas Av.	2" A.C.	34.0	36.0	2.55	2.37	659.8	2617.2	6204.96	5784.48
E. Broadway St.	N.E.Mississippi River	Main St. N.E.	3" Brick	40.0	40.0	5.55	5.55	1247.2	6588.0	33330.39	
E. Broadway St.	N. Penn Av. N.	City Limits	2" A.C. (Widen)	9.2	56.0	5.55	5.55	155.9	170.0	943.28	
E. Bryant Av. S.	26th St. E.	29th St. E.	2" A.C.	28.0	30.0	2.16	2.16	1785.0	5689.4	12316.65	
Central Av. N.E.	13th Av. N.E.	18th Av.N.E.	2" A.C. (Resurf)	44.8	60.0	1.12	1.12	1822.1	9248.8	10320.58	9539.04*
E. Cedar Lk Road	Penn Av.	Superior Av.	2" A.C.	32.0	34.0	2.56	2.56	2149.9	8245.2	21115.09	
Elliott Av. S.	28th St. E.	29th St. E.	2" A.C.	30.0	32.0	2.40	2.40	520.1	1730.7	4150.41	4072.00
E. Elliott Av. S.	Franklin Av.	24th St. E.	2" A.C.	30.0 (34.0	32.0 36.0	2.27	2.27	1242.4 1573.3)	4461.3	10110.76	
Emerson Av. S.	Mt. Curve Av.	24th St. W.	2" A.C.	(24.0	30.0	2.41	2.41	1198.5)	9397.1	22642.06	18857.93*
Emerson Av. N.	Lowry Av. N.	33rd Av. N.	3" Brick (Header)	3.4	43.0	3.84	3.84		259.1	995.14	472.80* ***
Elroy St.	Blaisdell Av.S.	Pleasant Av. S	3" Brick	30.0 (40.0	32.0 40.0	3.54	3.54	731.9 806.0)	2569.0	9093.00	6872.25*
8th St. S.	11th Av. S.	15th Av. S.	2" A.C.	(30.0	32.0	2.24	2.24	764.2)	6517.7	14611.11	120 15.37*
11th St. N.	Glenwood Av.	Holden St.	3" Brick	30.0	32.0	4.16	4.16	311.8	1071.0	4458.80	4152.00
1st Av. N.	12th St. N.	M.St.L.R.R.	3" Brick	30.0	32.0	3.95	3.95	442.1	1523.7	6017.35	5533.78
5th	Washington Av.	3rd St. N.	3" Brick (Resurf)	35.0	50.0	2.93	2.93	322.4	1225.3	3591.85	3589.92
E. 4th Av. S.	50th St.	3rd Av. S.	2" A.C.	14.0	20.0	2.15	2.15	1002.4	2170.1	4665.96	
E. 42nd Av. S.	42nd St.	46th St. E.	2" A.C.	30.0	32.0	2.27	2.27	2585.4	9006.6	2046.42	

1931 annual reports

See Table on page 9 for new pavements in 1931.

No significant pavement replacement in project area.

3rd Avenue N. – 2nd Street N. to 5th Street N.: 2" asphaltic concrete.

3rd Avenue Bridge.: 2" asphaltic concrete.

1933 annual reports

See Table on page 17 for new pavements in 1933.

1st Avenue N. – Washington Avenue to 9th Street N: brick header with 2" asphaltic concrete.

2nd Street N. – 10th Avenue N to Broadway: 5' brick gutter with 2" asphaltic concrete.

1934 annual reports

See Table on page 92 for new pavements in 1934.

No significant pavement replacement in project area.

1st Street N. looking south toward 4th Avenue N., 1920

Street Paving in the Minneapolis Warehouse Historic District: A Public Works Context, 1882-1936

Prepared for

Bonestroo

and the

City of Minneapolis
Community Planning and Economic Development Department

by

Carole S. Zellie
Landscape Research LLC

April 2011

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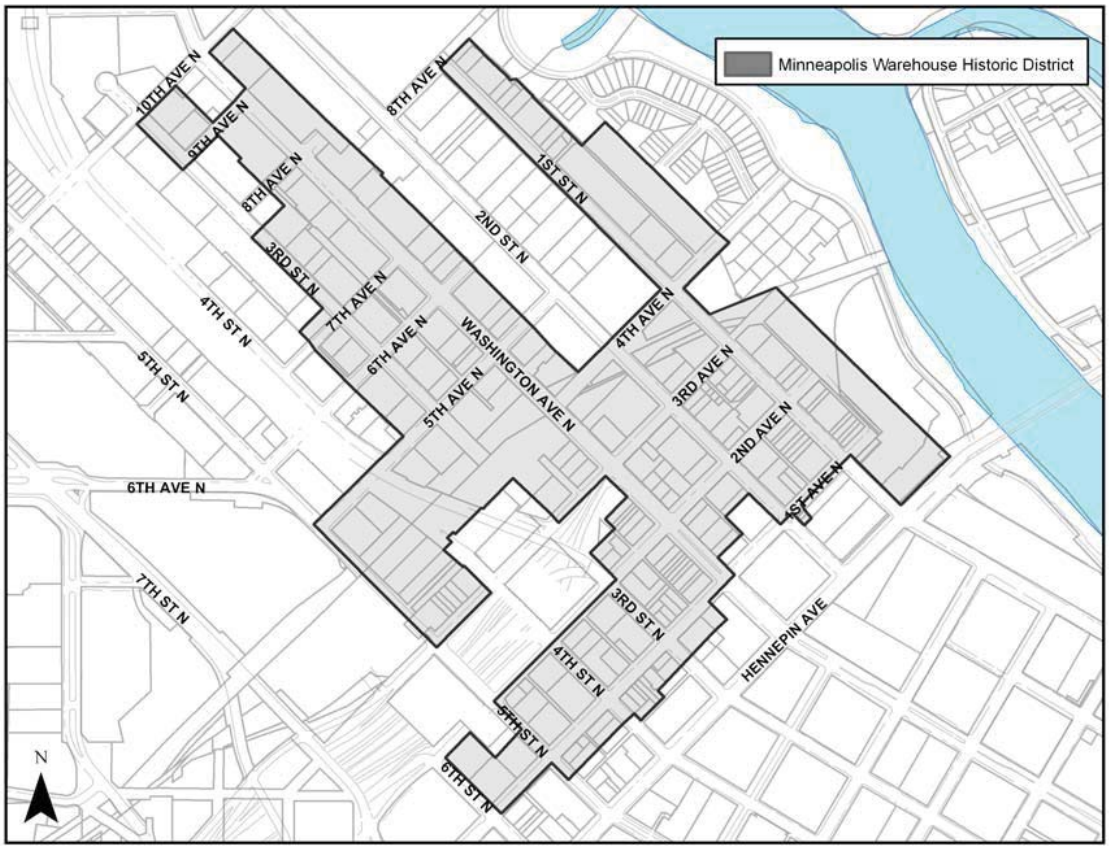

Fig. 1. Minneapolis Warehouse Historic District (City of Minneapolis)

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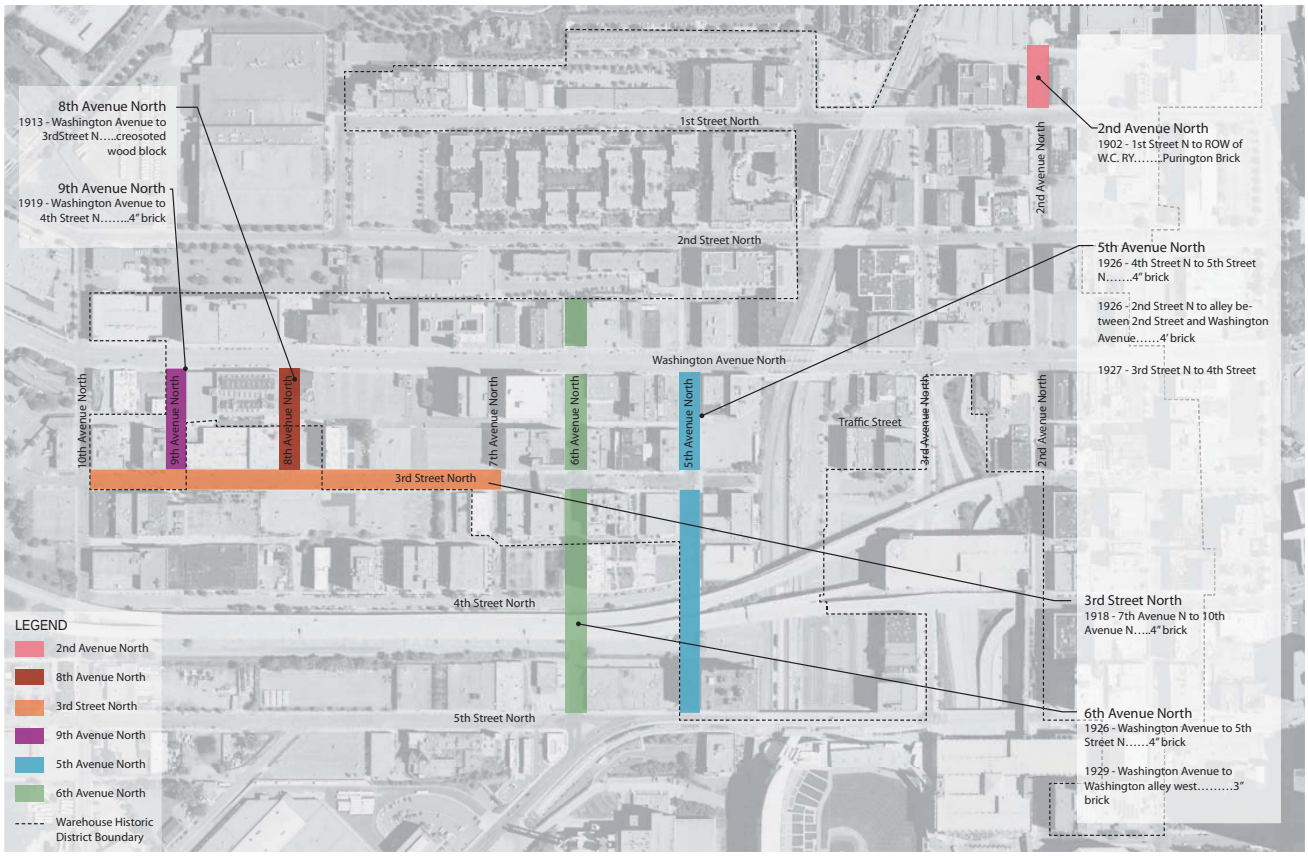


Street Paving History
WAREHOUSE DISTRICT HERITAGE STREET PLAN

1.0 Introduction

> No problem of city life is more important, none more difficult of solution than that of the proper formation of our streets and roadways.
>
> *Minneapolis Tribune*, November 22, 1881, 1

> Few things are better indication of the growth of a place, or indicate the rapidity of the change from town to city more exactly, than the extent to which street paving is carried.
>
> "About Street Paving" *Minneapolis Tribune*, November 24, 1883, 7

This study provides a contextual background for the Minneapolis Warehouse District Heritage Street Plan and contributes to an understanding of the significance of the Warehouse Historic District's remaining historic wood, brick, and granite paving materials (Figures 1 and 2). An overview of the development of this area is provided in the *Minneapolis Warehouse Historic District Designation Study* (2009). The current study is a companion to the *Warehouse District Heritage Street Plan* (2011) prepared by Bonestroo for the City of Minneapolis.

The period of significance for the Warehouse District is from 1865 to 1936.[1] These dates span from construction of the earliest extant building, the Pacific Block at 224 Washington Avenue N., to the decline of the area during the Depression. The history of paving improvements within the district boundaries begins in the 1880s. Each decade of subsequent paving work reflects national planning and engineering trends as well as site, budget, and political conditions unique to Minneapolis. Concurrently, the Minneapolis City Engineer also oversaw extensive water, sewer and bridge improvements that underpinned the area. During its first decades, the area within the boundaries of today's district comprised retail businesses, dwellings, and churches as well as railyards, factories and shops. By 1900, once light-duty streets required upgrading to support the demands of increasingly heavy traffic.

2.0 Sources and Methods

Government documents, newspaper accounts, municipal engineering periodicals, historic photographs from the Minnesota Historical Society, and published histories provided information for this study. Annual reports and other statements prepared by the Minneapolis City Council and City Engineer were consulted for the years 1873-1940. Street paving locations, materials, and costs were detailed in the City Engineer's reports, which were often illustrated with tables and maps. The *Minneapolis Tribune* (1867-1908) and *Minneapolis Morning Tribune* (1909-1922) provided additional information and editorial opinion about paving progress as well as failure. Engineering periodicals such as *Paving and Municipal Engineering*, *Engineering Magazine*, and the *Journal of the Association of Engineers Society* sometimes discussed Minneapolis in case studies of

paving materials and techniques. The literature review of public works history included Carl Abbott, “Plank Roads and Wood-Block Pavements,” in *Journal of Forest History* (1981); Clay McShane,“Transforming the Use of Urban Space: A Look at the Revolution in Street Pavements, 1880-1924,” in *The Journal of Urban History* (1979*)* and *Down the Asphalt Path: the Automobile and the American City* (1994). Stanley Schultz and Clay McShane, “To Engineer the Metropolis: Sewers, Sanitation and City Planning in Late-Nineteenth-Century America,” in *The Journal of American History* (1978) was among other works consulted.

John Slack of Bonestroo reviewed and analyzed Minneapolis City Engineer’s annual reports for the years 1889 through 1934. A summary of this information is included in the Appendix. Carole Zellie of Landscape Research LLC prepared the historic context report.

3.0 STREET PAVING IN THE MINNEAPOLIS WAREHOUSE HISTORIC DISTRICT: A PUBLIC WORKS CONTEXT, 1882-1960

3.1 Early Street Improvements and Paving in the Warehouse Historic District: 1882-1900

> With all our metropolitan pretensions and proportions we have not a rod of paved or macadamized street, our water system is grossly inadequate, and by its shortcomings a constant source of peril to the property and lies of our citizens, while, with trifling exceptions we are as destitute of a proper sewage system as the average frontier village.
>
> "A Word to Every Citizen," *Minneapolis Tribune,* October 11, 1881

Minneapolis grew impressively after the Civil War, and incrementally expanded its city boundaries across the Mississippi River after merger with St. Anthony in 1872. The flour and sawmills framing Saint Anthony Falls were at the center of the city's economic growth. Washington and 1st Avenues N. also grew as spines of a district south of the river that would form the heart of a railroad and warehouse district (Figures 2, 5-8). Economic expansion would require not only new streets and bridges, but design of an extensive water and sewer system on both sides of the Mississippi River. Selection of the best paving materials and techniques for the Minneapolis landscape and climate would be based on decades of research and much trial and error.

Fig. 3. Hennepin Avenue looking south toward Washington Avenue, 1875. Street railway tracks are laid on unpaved streets (MHS).

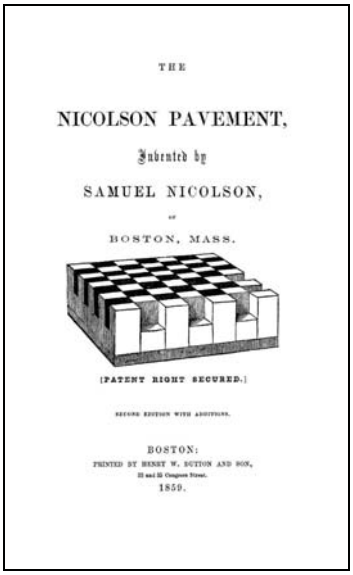
The city's first street grading project began in 1865 at Bridge Square at Hennepin and Nicollet Avenues. In 1873 the City of Minneapolis appointed H. H. Corson as the first City Engineer.[2] The Office of City Engineer was charged with all public works including streets, sewers, water and bridges.[3] The Street Division oversaw street surveying, grading, paving, sidewalks and curbs, and the creation of maps and profiles. Formal paving did not begin until 1882, however, when granite and cedar blocks were laid along a portion of Washington Avenue.[4] Despite the abundance of lumber, early street paving with pine planks, a practice popular in Wisconsin and Michigan, was apparently never adopted.

Many citizens complained about the condition of the city's business streets. The debate was carried on in daily newspapers and in City Council chambers. Articles in nationally syndicated newspapers regularly reviewed the pros and cons of various paving materials, and it was apparent that one city's success or failure would not necessarily be repeated elsewhere.[5] This was due to differences in topography, the availability of local materials and labor and, importantly, freeze-and-thaw cycles.

3.2 Many Paving Choices, Few Solutions

Early in 1882, on the eve of the city's first paving project, six types of paving materials were under consideration, including macadam, limestone block, granite block, Nicolson wood pavement, creosoted wood block, and asphalt blocks.[6] The merits of cedar versus granite blocks were most strenuously debated. Granite was durable, but it was expensive, noisy and caused heavy wear on horses and wagons. Treated or untreated wood—usually cedar—was praised for its cost and quiet surface suitable for residence areas, but it could be slippery and needed frequent replacement.[7] Macadam, composed of compacted gravel sometimes bound with oil, was cheap and suitable for pleasure drives and lightly used residential streets. Washington Avenue abutters petitioned in favor of cedar blocks, but City Engineer Andrew Rinker toured eastern cities and concluded, "wood should not be used at all."[8] The city's paving committee, on the other hand, visited Chicago and concluded that wood was suitable. By 1902, Rinker would completely reverse his opinion about wood paving.[9]

Municipal engineers placed great hope on the potential of wood block paving, whether pine, cedar, or other species. The method published in 1859 by Samuel Nicolson of Boston —the "Nicolson Paving"— utilized a relatively durable, inexpensive material that provided a quiet surface. The creosote-soaked pine was cut into blocks three to four inches wide, six to fourteen inches long, and six inches deep. They were laid together loosely on a sand foundation over one-inch planks coated with hot tar. The spaces were filled with tar and gravel. Nicolson's method was adopted by many cities, but patent infringement problems led to substitution of other methods such as the Boyington Paving first utilized in Chicago in 1868.[10]


THE

NICOLSON PAVEMENT,

Invented by

SAMUEL NICOLSON,

of

BOSTON, MASS.

[PATENT RIGHT SECURED.]

SECOND EDITION WITH ADDITIONS.

BOSTON:

PRINTED BY HENRY W. DUTTON AND SON,

21 and 23 Congress Street.

1859.

Fig. 4. Samuel Nicolson, *The Nicolson Pavement* (Boston 1859).

Wood paving, however, was slippery when wet, provided poor traction on steep grades, and harbored the potential for rot. Improvements included injection of creosote rather than soaking, and installation of blocks over a cement-concrete base.[11]

Minneapolis preferred cedar. In 1882, Washington Avenue was paved with cedar blocks from 3rd Avenue S. to 2nd Avenue N. Granite was laid between 8th and 3rd avenues S.[12] In 1883, cedar was installed on 1st Avenue N. from 1st Street to Washington Avenue, and along 2nd and 3rd avenues N. from 1st Street to Washington Avenue. Some alleys were concurrently paved in granite.[13]

In 1883, stone curbs and gutters were placed along 3rd Avenue from 2nd Street to 3rd Street N.; on 2nd Street from 3rd Avenue N. to 3rd Avenue S; and on 3rd Street from 4th Avenue N. to Sixth Avenue S.[14] Kettle River Sandstone and granite were initially used for curbing, with a small amount of limestone. Portland cement (then called "artificial stone") was adopted in 1887 and by constituted most of the city's curb material.[15]

By 1889 Minneapolis had 24 miles of paved streets. About 16 miles were in cylindrical cedar block laid on a plank bed, rammed with fine gravel and cemented with coal tar; four miles were granite, and one-half mile was asphalt.[16] Four years later, in 1893, 40 miles of paved streets included about 33 miles paved with cedar block. Two miles of Park Avenue, however, were asphalt-paved.[17] Natural or artificial stone ("cement") sidewalks lined the streets in the business district; plank sidewalks also remained in use.[18]

Despite this progress, however, in 1894 the state of paving for the city's most-traveled streets was called a matter of "humiliation and discomfort." The contest next shifted from wood to asphalt versus vitrified brick.[19] In that year, four blocks of asphalt were laid on Hennepin between Washington and 6th streets.[20] In the next year Wasatch Lime Rock Asphalt was laid on Nicollet Avenue, representing the first use of the material east of the Rockies.[21] City Engineer F. W. Cappelen and seven other city officials first made a nine-

day trip to Salt Lake City to inspect that city's paving. [22] The material was based on Utah Wasatch lime rock. It was also composed of a matrix of 54 percent Pittsburgh flux, 32 percent pure asphaltum gum, 12 percent residuum oil and heated sand. When installed in Minneapolis, however, it failed during its first winter season, prompting the headline, "Asphalt Cracks."[23]

Until the standardization of material specifications, which was achieved in the early 20th century, what was termed "asphalt" did not typically contain uniform ingredients. Asphalt consists of asphalt used to bind the material to aggregate (sand and gravel). It is laid down in layers and compacted. What was called asphalt in this period was later called asphalt concrete, while "concrete" referred to products containing Portland cement.

3.3 New Hope with Vitrified Brick

> Vitrified brick, the new paving material, will soon be given a trial in this city, and should it prove a success, the day of cedar blocks will be over.
>
> "An Experiment in Paving," *Minneapolis Tribune*, April 2, 1892, 4

The significant amount of remaining brick paving in the Warehouse Historic District is testament to the popularity of this material between ca. 1895 and 1930. When wood pavers laid a decade before began to fail, brick was often employed for replacement. Beginning in 1892, vitrified brick was given a thorough discussion in the local press and Minneapolis City Council members visited St. Louis to assess the success of brick in that city.[24] In 1895 the material was tested on Bridge Square.[25]

In 1896, however, and despite poor results in previous attempts, city leaders endorsed asphalt for business streets.[26] Asphalt enjoyed support from nationally prominent engineers, including George Tillson, who published the influential *Street Pavements and Paving Materials* (1901), which concluded that asphalt was an ideal paving material by standards of cheapness, durability, ease of maintenance. It was not slippery for horse traffic and was favored by bicyclists.[27] The proposed use of asphalt adjacent to streetcar tracks was immediately protested by the Minneapolis Street Railway Company. The company claimed that the life of asphalt "depends upon an absolutely rigid foundation.[28] The city prevailed, but within six years all of the asphalt failed and had to be removed. The street railway company next installed a base of crushed rock under the ties, with the spaces filled with concrete. The 91-pound rails were spiked to the ties, and the spaces between the rails paved with granite blocks grouted with Portland cement.[29]

Fig. 5. 507 Washington Avenue N., 1919. Asphalt (?), granite curb, and granite block at street railway tracks (MHS).

3.4 Asphalt Woes

> Minneapolis is heartily sick of asphalt.
> *Minneapolis Tribune,* November 10, 1905 [30]

Asphalt was attractively cheap to install but performed poorly for downtown business streets. It also proved very costly to replace with other materials: because it was thinner than other materials, any change required extensive demolition including the concrete foundation, manholes, sidewalks, and curbs.[31]

In 1897 the *Minneapolis Tribune* reviewed an article about brick from the *Engineering Record*. The Minneapolis writer concluded that brick was superior to asphalt in the northern climate: "Anyone can see, by glancing at our asphalt pavement on the business streets, that is already covered with excoriations and seams and faults . . . it is certain that some sections look as if the pavement would not last many years."[32] The writer asked if brick paving had been given an adequate test in Minneapolis.

Plymouth Avenue N. was repaved with brick in 1897, and in 1900 Washington Avenue was resurfaced from 5th Avenue N. to Plymouth. Both streets previously had cedar block roadways. The brick obtained from the Purington Brick Company of Galesburg, Illinois was laid on a three-quarter inch layer of sand above a 6-inch bed of concrete. A new coating on the brick was tried, consisting of a thin layer of Portland cement intended to prevent chipping of the brick edges and also serving as a moisture barrier. A thin layer of sand was rolled on top of the brick.[33] This work also involved installation of water, gas, electric, and sewer connections and new streetcar tracks.[34]

By 1912, City Engineer Rinker declared that he would "advise against the use of asphalt paving." [35] In addition to the failure of the material, the city's contractors failed to properly install and maintain the paving. Asphalt, nevertheless, continued to be used for

repairs and new installation and in 1913 Minneapolis purchased its own portable asphalt plant.[36] New asphalt paving in the Warehouse Historic District included 2nd Avenue N. between Washington and 2nd Street N.[37]

Although critiqued for poor performance, stone continued to be used for paving until well into the twentieth century. In 1897 Kettle River sandstone was laid along 1st Avenue N. from Washington to 4th Street, and on 3rd Avenue N. from 2nd to 3rd streets. In 1898, sandstone was laid on 3rd Avenue N. from 2nd Street N. to 3rd Street N. In 1904 it was placed on 5th Avenue N. between Washington Avenue and 2nd St. N., and in 1911 on 6th Avenue N. between Washington Avenue and 5th Street N.[38]

In 1913, granite was placed on 4th Avenue N. from 1st Street N. to 2nd Street N., and in 1916 it replaced sandstone on 2nd Avenue N. between Washington and 4th Street N.[39] Also in 1916 re-cut granite was used to replace sandstone laid on a sand foundation along 3rd Avenue N. from 1st St. to 2nd streets N. The granite was re-cut from stone laid elsewhere in 1883. The blocks were trimmed from their original five- to six-inch width and eight to ten-inch length to about five inches square. The joints were packed with Portland cement grout and an asphalt filler.[40]

Macadam, generally suited for light duty residential streets, was also installed in a few Warehouse Historic District locations, including that installed in 1902 on 8th Avenue N. from Washington to the Soo Line right-of-way.[41] Macadam was comprised of a graded soil roadbed with a three-inch crown to promote drainage. Two-inch (or smaller) crushed limestone was spread across the roadbed. The small aggregate ensured that the material would not get embedded in carriage wheels.

3.5 Creosoted Wood Block and Other Materials: 1902-1936

Following the repeated failure of asphalt, new developments in wood block paving made the City Engineer reconsider its use. A new generation of heavily creosoted blocks, rather than cedar, were believed to provide quiet and durable surfacing for the twentieth century. Introduced in Minneapolis 1902, creosoted blocks were laid on concrete rather than sand bases.[42] This was an improvement over previous practice, but in 1903 critics complained that some pavements were still being laid on native sand or mud, with poor results: “the money paid for labor and material . . . might as well be dumped in the river.”[43]

By 1905, Minneapolis ranked third in the amount of creosoted block pavement in use, outranked only by Indianapolis and New York. In that year the U. S. Forest Service began a test of various types of wood paving on Minneapolis streets, making the city “the center of street paving interest in the country . . . in the future this city will be watched by every one interested in the important point of paving for modern streets.”[44] The trial involved samples of creosoted Long leaf pine, Norway pine, Douglas fir, western larch, white birch, hemlock, and tamarack.[45] Cedar does not appear to have been tested. As the main thoroughfare of the northern part of the city, Washington Avenue sometimes served as a laboratory for such early 20-century paving experiments. In 1909, City Engineer Rinker contributed an article to *Good Roads Magazine* explaining the benefits of properly

creosoted blocks.[46] During this period civil engineers and other researchers conducted extensive tests on various paving materials. Forest-product scientists focused on improving wood block paving and tested performance of oils used for treating the wood blocks. Treatments including tannin and zinc-gypsum, kreodone oil, natural asphaltic oils from California and Mexico, and other creosoting oils of various types were debated, as well as the utility of various types of bases including concrete reinforced with steel wire.[47] Engineers proposed techniques such as corrugation and tightening with jackscrews to improve traction and safety for automobile traffic.

In 1912, the granite laid on Hennepin Avenue in 1883 was worn out and was replaced with creosoted wood blocks.[48] In 1916, after ten years of observing the U. S. Forest Service test results, it was reported that Longleaf pine had performed best, followed by white birch, eastern hemlock, tamarack, Norway pine, western larch, and Douglas fir.[49]

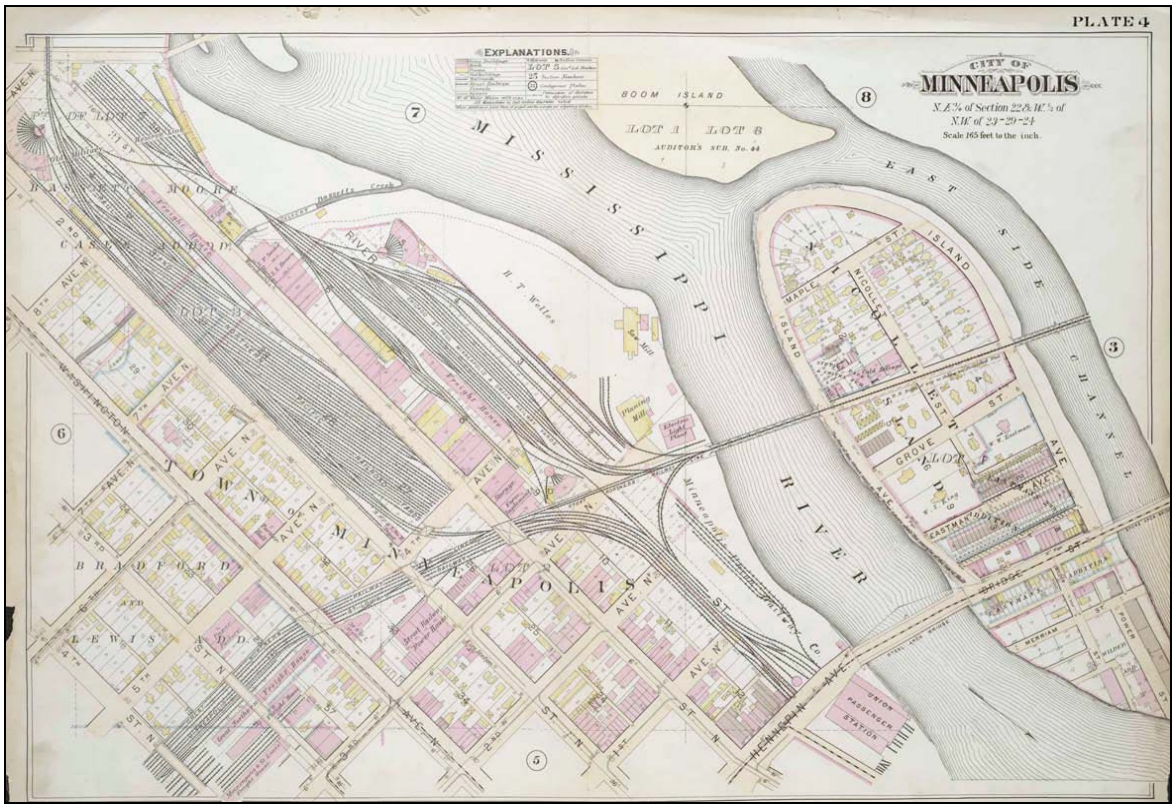


Fig. 6. A portion of the Warehouse District along Washington Avenue (C. M. Foote and Co., 1892, Plate 4).

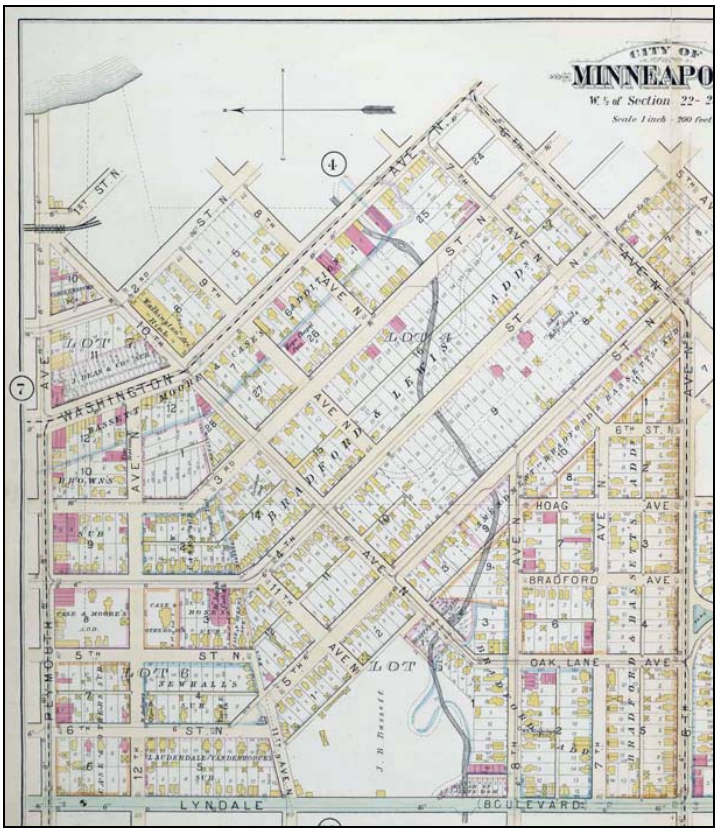


Fig. 7. A portion of the Warehouse District showing Bassett's Creek (C. M. Foote and Co., 1892, Plate 6).

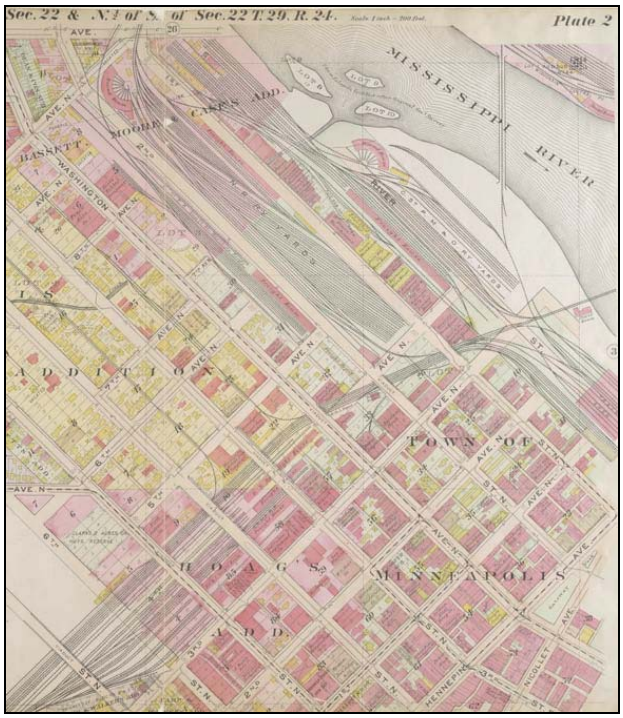
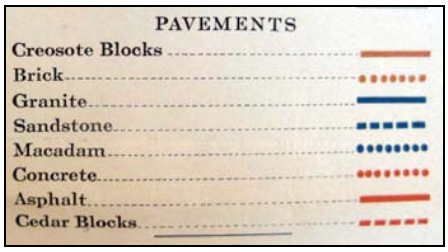


Fig. 8. A portion of the Warehouse District along Washington Ave. (Minneapolis Real Estate Board, 1915, Plate 2).

Fig. 9. Minneapolis Pavement Map (1917), from *Annual Report of the City Engineer of the City of Minneapolis,* 1916-17. Creosoted blocks, asphalt, brick, sandstone, and granite were in use.



By 1917, paving within the boundaries of the present-day Warehouse Historic District was a mix of creosoted blocks, asphalt, brick, sandstone and granite. Ambitious public works programs following World War I included street improvement programs intended to employ under- or unemployed municipal staff. A few sections of Portland concrete streets were poured in newly-developing areas of the city.[50]

In 1919, installation of 14 miles of new Minneapolis streets was accomplished with creosoted wood block, brick, concrete, asphaltic concrete, re-cut granite block and bituminous macadam.[51]

By the 1920s, most paving material was laid on a concrete foundation and in 1922 the city completed an asphalt and concrete plant at 1925 E. 26th Street. Wood-block paving was quiet, but with the sharp decline in horse-drawn traffic and tens of millions of rubber-tired automobiles, sound quality was no longer as important. The rising cost of lumber was also a consideration. Articles on wood-block paving "disappeared from the engineering literature after 1925," notes one historian.[52] New wood installation projects continued in Minneapolis through the 1920s, however, including one in 1923 along 5th Street N. from 1st Avenue N. to Hennepin Avenue.

Within the Warehouse Historic District, brick and re-cut granite also continued to be installed. In 1923, re-cut granite replaced sandstone on 2nd Street N. from 1st Avenue N. to the railroad bridge.[53] In 1930, 5th Avenue N. from Washington Avenue to 3rd Street N. was laid in brick.[54]

3.6 Concrete: 1913 and Beyond

Although concrete had been employed as a paving base since the turn of the century and had wide application to bridge and building construction, it was not employed for street surfacing in Minneapolis until about 1913.[55] Comprised of aggregate (sand and gravel), water, and Portland cement, the development of paving concrete relied on extensive study and experimentation with standardized specifications.[56] Concrete can support heavy loads with less deformation than asphalt and was used extensively for federal highway construction following the 1916 Federal-Aid Highway Act. During the Depression years of the 1930s, Works Progress Administration (WPA) and other federal programs aided Minneapolis street construction and repair. In 1947 the city's 298 miles of paved street included 190 miles of asphalt, 38 miles of brick, 31 miles of creosoted wood block, five miles of granite, and eleven miles of concrete.[57]

Concrete was also utilized for an extensive system of loading docks that served warehouse and factory buildings throughout the district.

Fig. 10. Wood block removal before asphalt paving, 3rd Street at 14th Avenue S., ca. 1940.

Extensive areas of brick and granite paving were covered over with asphalt following World War II. Wood block was apparently removed prior to resurfacing. Complete reconstruction of most Warehouse District streets was apparently not a priority, resulting in significant areas of brick paving, sections of granite and creosoted wood block, and granite curbing.

The rehabilitation and retrofitting of many Warehouse Historic District buildings began in the 1970s. Along with new construction, revitalization of the area has brought scrutiny to the survival and condition of historic paving materials and infrastructure such as loading docks. Brick, stone, and granite are among features that contribute texture and scale, as well as utility, to district significance and integrity.

3.7 Street Paving and the Public Realm

Street paving within the boundaries of the Warehouse Historic District followed the city's incremental progress toward creating its modern infrastructure. During the period 1882 to 1900, paving systems were still very experimental even as the city embraced two decades of unprecedented economic growth. City leaders understood that unpaved or poorly paved streets threatened the public health and progress of the city. In an era of increased knowledge of infectious disease, streets, sewers and water systems were the city's "lifelines" and the public sought a role in their design and upkeep.[58] Minnesota's harsh climate and freeze and thaw cycles were demanding. Granite, wood, and brick paving was originally designed for horses and horse-drawn conveyances, but the demands of automobiles, railroad, increasingly popular bicycles, and street railway construction required different materials and techniques. Smoothness, durability, and cheapness were prized qualities for all modes of travel.

Academically-trained civil engineers, serving as municipal employees and as consultants, enjoyed a key role as Minneapolis strove for excellence in public works and health. The Office of the City Engineer was charged with the construction of sewers, pavements, sidewalks, curbs and gutters, water mains, and bridges. Andrew Rinker (1849 -1918), a native of Philadelphia, supervised the early evolution of paving methods and oversaw a many of the city's important initial engineering efforts including the North Minneapolis Tunnel. Rinker was City Engineer from 1877 to 1893, and served again from 1902 to 1913. He is credited with laying 1 million square yards of pavement. [59] In 1889, he supervised the Street Division that included engineer I. E. Howe, an assistant engineer, a transitman, a superintendent of sidewalks, an assessment clerk, four levelmen, six rodmen, one draughtsman, and one clerk.[60]

Minneapolis consistently looked to other cities for comparative information. In 1881, Pittsburgh's paving experience was headlined as "Wood condemned, Asphalt Concrete Preferred for Suburban Streets and Granite Blocks recommended for Business Streets."[61] Among cities Minneapolis leaders looked to were London, Milwaukee, Pittsburgh, Detroit, and Chicago. A group of professional journals such as *Engineering News* printed frequent comparisons of street paving, water supply, sewer, and other improvements across many cities.[62]

> The paving question has been one of continual annoyance since the work was begun.
>
> "Paving Quarrel Continued," *Minneapolis Tribune* 29 May 1885, 3.

The choice of paving materials produced strong reactions from the public and provided topics for endless newspaper columns and editorials, in part because abutters were charged for improvements. One writer suggested that abutters inspect wood block work in progress, to verify "the foundation is solid and smooth; that the bricks and blocks are perfect, laid as closely as possible, and the necessary interstices thoroughly packed with gravel and tar."[63] Charles M. Loring (1833-1922) was particularly prominent in the campaign for good streets and endorsed creosoted wood laid on an arched concrete foundation.[64] Loring was the first president of the Minneapolis Board of Park Commissioners and his appointment as president of the American Park and Outdoor Art Society added to his already extensive travels. In 1899, after the Society's convention in Detroit, he pointed out the mistakes cities make "in paving with brick. They tried it in Detroit, and cannot be induced to put in any more. I rode over a street that was paved partly with asphalt and partly with brick. The first was as smooth as when first laid, the brick was as rough and noisy as is usually the case after a little use."[65]

In 1907, the Publicity Club of Minneapolis led the local launch of the nationwide City Beautiful movement. The City Beautiful gathered the support of many organizations including the Commercial Club and the Minneapolis Civic Commission, and its message included explanation of the importance of good roads. In 1910, many organizations supported creation of the *Plan of Minneapolis* by Chicago architect E. H. Bennett, which embodied the city's adherence to City Beautiful principles and relied on

an armature of wide, well-paved avenues.[66] Within the boundaries of today's Warehouse Historic District, streets supported heavy truck and railroad traffic that supplied railyards, warehouses, factories, and many other commercial and industrial businesses.

3.8 Historic Paving in Historic Districts

Brick, granite, or cobblestone paving are contributing features of local and National Register of Historic Places (NRHP) historic districts in many American cities. In at least two, wood-block pavement is a primary theme of a district designation. Cleveland's Hessler Court adjacent to the Case Western Reserve University campus is a block-long, wood-paved street listed in the NRHP in 1975. It is also locally designated. The paving dates from ca. 1908-1916.[67]

In Chicago, the wood-block paved alley at 1535 North Street, between Astor and State streets, is part of the Gold Coast NRHP District. The 18-foot-wide, 530-foot-long alley is paved with creosoted blocks laid in 1909. [68] The alley was individually listed in the NRHP in 2002 because it "represents an important development in city planning and transportation" and because it is exemplary of the long-term and widespread use of wood construction illustrating the importance of the lumber industry to the physical development of the city."[69]

Fig. 11. 1st Avenue N. from 4th Street looking north toward Washington Avenue and the river, ca. 1905. Cedar block or creosoted wood block paving is shown; brick pavers appear at right crosswalk (MHS).

Fig. 12. 4th Street from 1st Avenue N. to Hennepin Avenue, ca. 1905. Creosoted wood is likely material shown (MHS).

Fig. 13. Looking northwest on Washington Avenue from 5th avenue N., 1954. Asphalt paving is shown, with granite pavers along streetcar right-of-way (MHS).

3.9 Endnotes

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[2] Issac Atwater, *History of the City of Minneapolis, Minnesota*, vol 1 (New York: Munsell and Company, 1893), 92.
[3] "City Engineer's Report," *Annual Report of Various City Officers of the City of Minneapolis for 1889* (Minneapolis: Harrison and Smith), 1890.
[4] "About Street Paving," *Minneapolis Tribune*, 24 Nov 1883, 7.
[5] "Paved Streets," *Minneapolis Tribune* 21 Oct. 1881, 4.
[6] "The Local Hopper," *Minneapolis Tribune* 29 Oct. 1881, 7.
[7] "Street Paving," *Minneapolis Tribune* 1 Feb 1882, 7.
[8] 'Cedar or Granite?" *Minneapolis Tribune* 7 April 1882,7; 23 March 1882, 7.
[9] Andrew Rinker, "Creosoted Wood Block Street Paving," *Good Roads Magazine* (April 1909), 272-273.
[10] Madeleine Metzler, "Wooden Alley," National Register of Historic Places Nomination Form, 2001, 8-11. Accessed as http://gis.hpa.state.il.us/hargis/PDFs/219000.pdf.
[11] David O. Whitten, "A Century of Parquet Pavements: Wood as a Paving Material in the United States and Abroad, 1840-1940. "*Essays in Economic and Business History* XV (1997), 209-226. Accessed as http://www.kaswell.com/historical/whitten_2b.htm.
[12] "Street Paving: Work on Washington Avenue to be Commenced July 15," *Minneapolis Tribune* 29 June 1882, 6.
[13] "About Street Paving," *Minneapolis Tribune* 24 Nov 1883, 7.
[14] "About Street Paving," 24 Nov 1883, 7.
[15] *Annual Report of the City Engineer of the City of Minneapolis*, 1918, 75.
[16] "At the City Hall." *Minneapolis Tribune* 1 Jan. 1889, 5; 1889; "Engineer's Report,"*Annual Report of Various City Offices, 1890*, 110.
[17] Atwater, 416.
[18] Atwater, 416.
[19] "Minneapolis in 1894," *Minneapolis Tribune* 16 Dec 1894, 1.
[20] Ibid.
[21] *Annual Report of the City Engineer of the City of Minneapolis*, 1895; "Minneapolis," *Paving and Municipal Engineering* April 1896:285; "Asphalt Cracks," *Minneapolis Tribune* 4 Jan 1896, 10.
[22] "Now for New Paving," *Minneapolis Tribune* 28 March 1895, 7.
[23] "The Utah Asphalt Pavement in Minneapolis," *Paving and Municipal Engineering* (February 1896), 118.
[24] "An Experiment in Paving," *Minneapolis Tribune* 2 April 1892, 4; "Pointers on Paving," *Minneapolis Tribune* 22 Nov 1893, 5.
[25] *Annual Report of the City Engineer of the City of Minneapolis*, 1895; 1896.
[26] "Asphalt is Bad: Hennepin Avenue Paving Will Not Quite Do," *Minneapolis Tribune* 29 Nov 1894:5; "Bobbed Up Again," *Minneapolis Tribune* 13 March 1896, 8.
[27]George W. Tillson, *Street Pavements & Paving Materials* (New York, 1901), 167.
[28] Department of Commerce and Labor, Bureau of the Census, *Street and Electric Railways, 1907* (Washington D.C.: Government Printing Office 1910), 228.
[29] Ibid., 228.
[30] "Making the Best of It," *Minneapolis Tribune* 10 Nov 1905, 4.
[31] "The Limitations of Asphalt Paving," *Minneapolis Tribune* 15 March 1906, 4.
[32]"Good Paving Specifications," *Minneapolis Tribune* 11 July 1897, 6.
[33] "A Fine Street," *Minneapolis Tribune* 29 July 1900, A12; 1897 and 1898 *Annual Report.*
[34] "A Fine Street," *Minneapolis Tribune* 29 July 1900, A12; "Joy in Plymouth Avenue," *Minneapolis Tribune* 23 July 1899, 2.
[35] "Asphalt Paving is Opposed," *Minneapolis Morning Tribune* 24 Feb 1912, 11.
[36] "Return to Asphalt," *Minneapolis Morning Tribune* 23 July 1913, 8.
[37] *Annual Report of the City Engineer of the City of Minneapolis*, 1913.
[38] *Annual Report of the City Engineer of the City of Minneapolis*, 1904; 1911.

[39] *Annual Report of the City Engineer of the City of Minneapolis*, 1913, Table No. 10; *Annual Report* 1916, 74.
[40] *Annual Report of the City Engineer of the City of Minneapolis*, 1916, 4.
[41] *Annual Report of the City Engineer of the City of Minneapolis*, 1902, Table No. 13, 164.
[42] *Annual Report of the City Engineer of the City of Minneapolis*, 1902; "Tenth Street Paving Done," *Minneapolis Tribune* 13 July 1902, B7.
[43] "Public School Education and Street Paving," *Minneapolis Tribune* 20 Sept. 1903, 16.
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[46] Andrew Rinker, "Creosoted Wood Block Street Paving," *Good Roads Magazine* (April 1909), 272-273.
[47] Whitten, 1997.
[48] "First Paving Worn Out," *Minneapolis Morning Tribune* 38 March 1912, 8.
[49] *Annual Report of the City Engineer of the City of Minneapolis*, 1916, 4.
[50] *Annual Report of the City Engineer of the City of Minneapolis*, 1918, Table No. 6.
[51] "14 Miles of Paving Planned this Season, "*Minneapolis Tribune* 12 April 1919,10.
[52] Whitten, 1998.
[53] *Annual Report of the City Engineer of the City of Minneapolis*, 1923.
[54] *Annual Report of the City Engineer of the City of Minneapolis*, 1930.
[55] *Annual Report of the City Engineer of the City of Minneapolis*, 1913, Table No. 10.
[56] Bruce E. Seely, "The Scientific Mystique in Engineering: Highway Research at the Bureau of Public Roads, 1918-1940," in *The Engineer in America*, Terry S. Reynolds, ed. (Chicago: University of Chicago Press, 1991, 311).
[57] *Report on Survey of Public Works in the City of Minneapolis* (Public Administrative Service, Chicago, 1947), 28.
[58] Stanley K. Schultz and Clay McShane, "To Engineer the Metropolis: Sewers, Sanitation and City Planning in Late-Nineteenth-Century America" *Journal of American History*, vol. 65 (September 1978), 397.
[59]Andre Rinker obituary, *Minneapolis Tribune* 19 Mar 1918, 8. Rinker was engineer for the Great Falls (Montana) Townsite Company during the interim; see *Progressive Men of Montana* (Chicago: A. W. Bowen), 391. F. W. Cappelen succeeded Rinker and served until his death in 1918. Cappelen also served for one year in 1892. He was succeeded by N. W. Elsberg.
[60] *Annual Report*, 1890.
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[62] Atwater, 401.
[63] "Inspection of Paving by the Public," *Minneapolis Tribune* 19 Aug. 1904, 4.
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[65] "City Has Much to Learn," *Minneapolis Tribune* 7 July 1899, 7.
[66] "World Center Here Civic Planners' Aim: Framework on Which to Build Greater Minneapolis Outlined," *Minneapolis Tribune* 21 Dec 1910, 1.
[67] Dianne Timblen, "History on the Road: Cleveland's Hessler Court," *Forest History Today* (Spring 2008), 55.
[68]Madeleine Metzler, "Wooden Alley," National Register of Historic Places Nomination Form, 2001, accessed as http://gis.hpa.state.il.us/hargis/PDFs/219000.pdf, 8-11.
[69] Metzler, 8-17.

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5.0 Appendix

Warehouse District and Minneapolis Paving Activity Summary
City Engineer's Annual Report, City of Minneapolis Annual Report
Compiled by John Slack ASLA, Bonestroo

1889 Annual Report - Since this is the first version, the city engineer sums up the street paving that has been done up to this point (past 8 years). There are 24 miles of paved streets and 4 done in this year - 80% are cedar block, 20% granite. The table that lists paved streets prior to 1889 is on page 120 and it identifies portion of street and material used, the 1889 table is on page 124.

1890 Annual Report – see table on page 118.

1891 Annual Report – see table on page 108.

1892 Annual Report – see table on page 116.

1893 Annual Report - City engineer describes that a discussion has begun on using brick for paving (page 116). At this point, 300 of 800 city streets are paved with 63 miles of cedar block, 2.8 of asphalt, 9.5 of granite, and 2 of macadam. He goes into the cost details of each, including the base. Granite was the most commonly used material for curbing. There is a discussion on page 120 about the City's success in abolishing railroad grade crossings. See paved street table, page 128.

1894 Annual Report - Apparently businesses in downtown pushed for brick to start being used and brick was ordered against the engineer's advice. His report goes into extensive detail about the types of brick, where they come from, and how much they cost. There is a MAP of paved streets by material type on page 144. See paved street table, page 146.

1895 Annual Report - The Downtown controversy is over - they used Utah Wasatch Limerock Asphalt on Nicollet Ave instead of brick. Minneapolis is the first city east of the Rockies to use this material. The city engineer wanted to test brick on one block of Washington between 2nd and 3rd Aves S but didn't end up occurring. The Council did take a trip to Des Moines to visit the Brick Makers Association and inspect 60 miles of that city's brick pavements, and thy were in good condition. The engineer finally tested the first brick on a strip 60 feet in length on Bridge Square over Great Northern Railway tracks. They used four types of brick. The test was a success and the engineer proposes using brick my commonly, particularly if it can be manufactured closer to home (page 123). See paved street table, page 166. A map is on page 167.

1896 Annual Report - Important year for paving, some old, dilapidated cedar block pavements finally removed and substituted with asphalt. Apparently cedar block only really is good for 5 years and asphalt has 10-year guarantee. This report points out the first ever pavement (1882) was granite on Washington south of 3rd Ave S and cedar block north of 3rd Ave S. All brick used so far in city comes from Des Moines. Page 119 has an interesting discussion on how tracks are laid in the streets and that they are a particularly a problem in the cedar block streets due to contraction and the need to fill the gaps with another material. Se paving table, page 160; map on page 161 shows a small stretch of brick in the North Loop (but not in the district).

1897 Annual Report - Not much paving, lack of money and uncertain of what material to use. Next brick street constructed in city - 7th St between Hennepin and 7th Ave S. More mention of Purington Brick Company out of Galesburg, IL. Businesses and property owners really like the brick, also bicyclists. Paving repairs are starting to be more of a problem - old cedar block in such bad condition that they

aren't being repaired but instead abandoned and covered with gravel - okay in the winter but a muddy best in summer. Now the city has started to use brick exclusively. See paving table and map, page 232.

1898 Annual Report - Bidding process to find a brick manufacturer are described on page 155. Contract let to Purington Company, lowest bidder and "furnishing, in my opinion, the best brick of all concerns bidding." City also trying Kettle River Sandstone blocks, laid in parts of North Loop - 1st Ave N. from Washington to 4th St and 3rd Ave N. from 2nd to 3rd Sts. See paving table, page 201. Another interesting table on page 205 of pavement removed and replaced by other pavement - first year this is inventoried.

1899 Annual Report Annual Report - Annual Report discusses the maintenance of different paving types found within the City. City Engineer has discussed the maintenance of different paving types with seven leading cities. These discussions regard the merit of each paving type but notes to give the tax payers their monies worth depends not only on the material but also the method of placement and treatment afterwards. Too much sprinkling and sweeping are detrimental to pavements and the “seven” department heads have all but condemned the sprinkling of asphalt paving.

See paved street table, page 181. Kettle sandstone pavers laid in lieu of cedar blocks on 3rd avenue n – from 2nd street n to 3rd street north. Remainder of block from fifth street to (175’ towards 4th street was laid with the same sandstone material. See page 197 of pavement removed and replacement chart. Washington Avenue replaced from 3rd Avenue S. to 3rd avenue N. from cedar block to asphalt.

This is the first year bicycle paths showed up in the engineer’s report.

1900 Annual Report - For the first time in the history of the city all of the paving, curb and gutter was done by day labor (city had to purchase equipment and find skilled laborers).

Engineer noted that Washington Avenue from 3rd Avenue N. to 5th avenue N. was to be paved with brick pavers in the upcoming year. Businesses in the area contributed money to intersections.

A large portion of Washington Avenue from 5th Avenue N. to 14th Avenue N. was repaved with brick from cedar block. Granite curb was also set as part of this project. See pavement removal and replacement chart, page 175. No paving map.

1901 Annual Report - Cost of pavement repairs in the city exceeded pavement repairs from the previous year. This excess was associated to brick pavements to the use of tar filler. This filler was adopted in place of cement filler at the request of property owners so that the street might be cured quickly in condition for travel. Tar filler would provide a more “elastic” condition that the cement filler and reduces the expense of replacing the pavement when tore up for subway work.

The following streets were recommended for replacement: Fifth avenue N. – 2nd street to Washington Avenue. Paving done in 1901 included: Washington Avenue N. – 5th Avenue intersection; Washington avenue N. - 3rd avenue to 4th and then 4th to 5th avenues including the bridge. See chart, page 169.

Paving removed and replaced includes Washington Avenue N – 5th Avenue intersection (cedar block to brick), Washington avenue N. - 3rd avenue to 4th avenues (brick) and 4th to 5th avenue (sandstone on concrete). See chart, page 171.

Chart on page 173 describes asphalt paving on Washington Avenue from 3rd Avenue S. to 3rd Avenue N. as being installed in 1896.

1902 Annual Reports - 1902 is the first mention of creosoted wood block paving materials. Also a wide variety of installation methods discussed: granite on sand or concrete, brick, sandstone on sand or concrete and Macadam with granite or limestone dressing.

Engineer identified issues with Macadam paving and considers the system a total failure and has expensive maintenance costs.

Paving chart on page 164 identifies new paving on 8th Avenue N. from Washington to the ROW of the SOO railroad: paved as macadam L. top.

Paving done on 2nd avenue N – 1st Street N to ROW of W.C. RY is Purington Brick.

TABLE No. 13.

Paving Done During the Season of 1902 and Assessed in the Taxes for the Year 1902.

All assessable property is assessed for the cost of the street on which the property abuts The cost of paving all street intersections and parts along property exempt from special assessments is paid out of the permanent improvement fund, which is raised by general taxation. The paving is paid in five equal annual installments, with interest at five per cent per annum on all deferred payments. All work done by the city by day labor.

STREET.	From—	To—	Kind.	Width in Feet			Rate of Assessment Per Sq. Yd.	Cost per Sq. yard.	Length Paved in Feet and 10ths.	Square yards Paved by		Cost of Paving Laid by City.	Amount of Assessment.
				Paved by St. Ry. Co.	Paved by City.	Roadway.				Street Railway Co.	City.		
Alley, Block 37	Town of Minn	eapolis	Purington Bl'k Bk.	.....	10.0	10.0	.....	2.69	55 4	.....	57.10	153.85	Money adv'c'd
Cedar av.	5th st.	7th st.	Purington Bl'k Bk.	15.1	34.9	50.0	2.10	2.19	832.3	1,299.98	3,878.67	8,503.48	4,938.01
Hennepin av.	10th st.	13th st	Sandstone on Con.	15.1	48.9	64.0	2 58	2.54	1,100.3	** 1,939.67	6,317.46	16 042.83	12,643.23
Hennepin av.	13th st.	Harmon Pl	Sandstone on Con.	15.1	48.9	64.0	2.60	2.64	1,789.3	‡ 3,007.57	19,244.22	27,667.34	22,381.18
Main st. N. E.	Central av.	1st av. N. E.	Macadam Gr. Top.	.....	56.0	56.0	1.25	1.13	405.0	.....	2,609.36	2,943.36	2,847.48
Main st. N. E.	3rd av. N. E.	4th av. N. E.	Macadam L. Top.	.....	47.9 56.0	47.0 56.0	.96	.96	612.0	.....	4,417.07	4,240.39	2,870.79
Marshall st. N. E.	4th av. N. E.	5th av. N. E.	Macadam Gr. Top.	.....	34.0	34.0	1 25	1.25	554.25	.....	2,274 87	2,848.14	2,803.74
Nicollet av.	13th st.	Grant St.	Purington Bl'k Bk.	.....	50.0	50.0	.....	2.32	424.55	.....	2,369 73	5,493.86	Assess. in 1903
Univ. av. S. E.	7th av. S. E.	10th av. S. E.	Sandstone.	.....	40.0	40.0	1.96	1.91	1,309.7	.....	6,529.73	12,502.17	8,744.36
Univ. av. S. E.	10th av. S. E.	14th av. S. E.	Sandstone.	.....	40.0	40.0	1.96	1.94	1,332.7	.....	6,266.32	12,156.12	11,335.42
Western av.	N. Irving Av.	N. James av.	Purington Bl'k Bk.	15.1	26.9	42.0	2.10	2.37	299.2	501.99	859 63	2,035.78	1,815.03
1st av. N.	1st st.	R.of W.W.C.Ry	Purington Brick	.....	50.0	50.0	.....	.....	157.8	.....	988.60	.....	By W.C.Ry.Co.
1st av. N.	5th st.	6th st.	Sandstone	.....	50.0	50.0	1.86	1.91	341.3	.....	1,926.10	3,886.63	3,412.20
2nd av. N.	1st st.	R.of W.W.C.Ry	Purington Brick	.....	50.0	50 0	.....	.....	170.5	.....	947.23	.....	By W.C.Ry.Co.
2nd av. N.	Wash. av. N.	4t st.	Sandstone	.....	50 0	50.0	1.86	1 87	682.0	.....	3,822 60	7,166.51	6,865.76
3rd av. N.	1st st.	2nd st.	Sandstone	.....	50.0	50.0	1.86	1 81	333.5	.....	1,906.16	3 483.67	3,354.35
6th av. S.	Wash. av. S.	3rd st	Sandstone	.....	50.0	50.0	1.86	1.86	331.15	.....	1,861 32	3,469.97	3,306.63
8th av. N.	Wash. av. N.	R.of W.Soo.Ry.	Macadam L. Top.	.....	40.0	40.0	.....	.....	166.0	.....	718.56	.....	Private Parties
10th av. S.	Wash. av. S.	3rd st	Purington Bl'k Bk.	.....	50.0	50.0	2.04	2.06	332.4	.....	2,275.37	4,694.30	4,475.23
10th st. S.	1st av. S.	Park av.	Creosoted Wood Bk	.....	39.0 40.0	39.0 40.0	2.79	2.79	3,145.95	¶ 262.80	13,304.69	37.120.08	26,343.47
20th av. N.	Miss. R. Bdge.	Wash. av.	Sandstone	.....	64.0	64.0	1.82	1.82	1,183.0	.....	8,666.11	15,772.32	12,822.91
20th av. N.	Wash. Av. N.	4th st.	Sandstone on Con.	15.1	40.9 48.9	56.0 64.0	2.60	2 63	739 85	† 1,247.07	3,924.87	10,320.62	8,450,69
20th av. N.	4th st.	N. Lyndale av.	Sandstone	15.1	40.9	56.0	1 90	‡	857.4	‖ 1,357.40	‡ 2,477.80	7,926.38	6,118.90
Totals									17,155.55	9,716.48	88,643 57	187,597.80	$145,529.38
												6,805.33	Cost in 1903
												180,792 47	Net cost of Paving in 1902

.8475 miles of creosoted wood block.
.2959 miles of granite on concrete.
1.4814 miles of sandstone on concrete.
2.1121 miles of sandstone on sand.
.8381 miles of Brick.
.3083 miles of macadam (granite top).
.3242 miles of macadam (limestone top).

6.2075 miles of average 27 ft. roadway.

*Not finished
**Granite.
‡In this amount 805.24 sq. yards sandstone, 2202.33 sq. yards is granite.
†In this amount 55.17 sq. yards granite, 1191.90 sq. yards sandstone.
‡Not yet finished (to be in 1903).
¶Of this amount namely 282.8 sq. yards, 120.94 sq. yards is creosote block balance or 141.86 sq. yards is granite.

‖Of this amount 348.6 sq. yards is Granite balance 1008.8 sq. yards sandstone.

1903 Annual Reports - No text descriptions of paving.

Paving done on 4th Avenue N. – 1st street N. to 2nd street N.: sandstone on sand.

Paving on 5th Avenue N. – 2nd Street N. to ½ way to Washington Ave.: sandstone on sand.

1904 Annual Reports - Paving on 5th Avenue N.: –Washington to ½ way at 2nd street N.: sandstone on sand.

1905 Annual Reports – No significant projects.

1906 Annual Reports - Pavement map on page 36 of engineer's report.

Paving on 10th avenue N. –Washington Avenue to 2nd Street N.: cedar block to sandstone on sand, and Washington Avenue to 3rd Street N.: cedar wood block to sandstone on concrete.

Engineer's report provided report on cooperative comparative test of different woods for creosoted block paving: test was on Nicollet Avenue between Washington Avenue and 1st Street N.

See scanned maps and documents.

1907 annual reports - Pavement map on page 35 of engineer's report.

No significant pavement replacement in project area.

1908 Annual Reports - Pavement map on page 8E.

Documentation in annual report of more creosote wood pavement usage throughout the City.

No significant pavement replacement in project area.

1909 Annual Reports - Pavement map on page 14E.

No significant pavement replacement in project area.

1910 Annual Report - Pavement Map on Page 14e.

Only significant pavement repair/ replacement in the project area along 3rd Avenue N – 2nd Street n to 4th Street N.: pavement replaced was creosoted southern pine from sandstone.

Annual report paving replacement chart found on 16e identifies 85% of all pavement replacement within streets was with creosoted wood blocks. Brick was the primary material used for alleys.

1911 Annual Reports - Pavement map found on page 16e.

Pavement chart found on page 18e.

6th Avenue N – Washington Avenue to 5th Street N.: sandstone on sand.

5th Avenue N – Washington Avenue to 3rd Street N.: creosoted block.

3rd Street N – 3rd Avenue N to 6th Avenue N.: creosoted block.

1912 Annual Reports - Pavement map found on page 8e.

3rd Street N –6th Avenue N. to 7th Avenue N.: creosoted block.

7th Avenue N – Washington Avenue to 3rd Street N.: creosoted wood block.

1913 Annual Reports - During 1913 over 90,386 sf of 3.5" creosoted block was laid in the City and another 44, 857 4" creosoted block was laid. This was more than half of the 222,000 sf of pavement materials for the year.

During this year the City purchased the previous Railway portable asphalt plant and laid roughly 11,200 sf of asphalt on some of the major streets in the City (University Avenue, Plymouth Avenue, 1st Avenue N, 2nd Avenue N.

Creosoted wood block pavements – the wood used for the creosoted pavements was southern yellow pine (also called long leaf yellow pine). And was treated in Minneapolis utilizing standard specifications defined by the association of standardizing paving specifications; using 16 pounds of oil per cubic foot of wood.

See pavement map on page 8e.

8th avenue n – Washington Avenue to 3rd street N.: creosoted wood block.

3rd avenue n – 4th street N. to 5th street N.: creosoted wood block from sandstone on sand.

2nd avenue n – Washington Avenue to 2nd Street N.: asphalt.

4th avenue north – 1st street N. to 2nd Street N.: granite.

TABLE NO. 10.

PAVING DONE IN THE SEASON OF [illegible]

All assessable property is assessed for the cost of paving that part of the street on which the property abuts. The cost of paving [illegible] of the permanent improvement fund, which is raised by general taxation. The paving is paid in [illegible] on all deferred payments. All work done by the city [illegible].

Street	From	To	Kind of Paving	Width Paved by St. Ry. Co. Feet	Width Paved by City Feet	Width Roadway Feet	Rate [illegible] per square yard	[illegible] per square yard	[illegible]	[illegible]	[illegible]	[illegible] Paid by City
Alley in blk 14, Harmons' add	12th st S	Lots 2 and 9	Creosoted wood		13.5	14	[illegible]	[illegible]			[illegible]	[illegible]
Alley bet. Clinton and 3d avs S	26th st	S line lot 11, blk 2, R. A. Davidson's	Concrete		12	12	1.55	[illegible]	[illegible]		[illegible]	[illegible]
Alley in blk 3, Hoag & Bells add	7th st N	End of alley	Brick		10	10	3.26	[illegible]	[illegible]		[illegible]	[illegible]
Alley in blk 12, Snyder & Co.'s 1st addition	10th st S	11th st S	Brick		12	12	2.57	[illegible]	[illegible]		[illegible]	[illegible]
Blaisdell av	24th st	25th st	Creosoted wood		28	30	2.57	2.56	[illegible]		[illegible]	[illegible]
Blaisdell av	Elroy st	Lake st	Creosoted wood		28	30	2.60	2.65	[illegible]		[illegible]	[illegible]
*Broadway st	Tyler st	Johnson st	Brick		38	40	.92	2.25	[illegible]		[illegible]	[illegible]
Calhoun blvd	Lake st	Dean blvd	Concrete		24	28	1.13	1.13	[illegible]		[illegible]	[illegible]
Chicago av	14th st	Franklin av	Creosoted wood	15.2	29.14	46	2.55	2.48	[illegible]	[illegible]	[illegible]	[illegible]
Clinton av	22d st	24th st	Creosoted wood		28	30	2.52	2.48	[illegible]		[illegible]	[illegible]
Excelsior av	Lake st	City limits	Concerete		16	40	1.40	1.38	[illegible]		[illegible]	[illegible]
8th st S	Nicollet av	Hennepin av	Creosoted wood		25.4	38	2.00	1.98	[illegible]		[illegible]	[illegible]
†8th av N	Washington av	3d st N	Creosoted wood		40	40	2.50	2.50	[illegible]		[illegible]	[illegible]
‡8th av N	Humboldt av	Elwood	Macadam		30	32		1.17				[illegible]
11th av N	Irving av	Knox av	Macadam		30	32	1.48	1.53	316		[illegible]	[illegible]
Farwell av	Sheridan av	Thomas av	Macadam		28	30	1.35	1.35	311		[illegible]	[illegible]
§1st av N	4th st	5th st-N ½	Asphalt		17.4	50		1.26	311		[illegible]	[illegible]
4th st N	20th av N	21st av N	Creosoted wood		30	32	2.50	2.53	[illegible]		[illegible]	[illegible]
§4th av N	1st st	2d st	Granite		20	50		1.43	[illegible]		[illegible]	[illegible]
14th av N	Oliver av	Penn av	Macadam		30	32	1.45	1.49	[illegible]		[illegible]	[illegible]
§42d av N	Bridge over river		Creosoted wood		34	36		1.66	1,372		[illegible]	[illegible]
Girard av N	Plymouth av	20th av N	Concrete		30	32	1.44	1.44	2,542		[illegible]	[illegible]
Hennepin av	10th st	15th st	Creosoted wood	15.2	48.8	64	2.25	2.25	1,828		[illegible]	[illegible]
Hennepin av	31st st	36th st	Creosoted wood		30	32	2.50	2.49	3,230		[illegible]	[illegible]
E Island av	Central av	N line lot 5 Nicollet Island	Creosoted wood		28	30	2.66	2.66	1,102		[illegible]	[illegible]
‡E Lake st	29th av S	River	Creosoted wood	15.2	3	50		2.45		[illegible]	[illegible]	[illegible]
Monroe st	Broadway st	15th av NE	Creosoted wood		30	30	2.35	2.37	1,590		[illegible]	[illegible]
¶19th av N	Thomas av	Xerxes av	Concrete		34	36	1.21	1.67	1,274		[illegible]	[illegible]
Oliver av N	Plymouth av	16th av N	Macadam		26	28	1.45	1.49	1,276		[illegible]	[illegible]
*Penn av N	Crystal Lake av	36th av N	Creosoted wood	15.2	20.8-32.8	38 & 50	2.60		4,432	[illegible]	[illegible]	[illegible]
■Penn av N	Crystal Lake av	19th av N	Concrete		30	32	.99	1.36	1,785		[illegible]	[illegible]
Pillsbury av	24th st	28th st	Creosoted wood		30	32	2.57	2.58	2,617		[illegible]	[illegible]
Pleasant st	University av	N. P. Ry	Creosoted wood		25 & 30	25 & 30		2.42	1,226		[illegible]	[illegible]
§Plymouth av	Bridge over river		Creosoted wood		34	34		1.86	935		[illegible]	[illegible]
§Plymouth av	Washington av	2d st N	Asphalt		42	42		.76	331		[illegible]	[illegible]
Richfield av	Calhoun blvd	39th st	Concrete		16	36	1.30	1.69	592		[illegible]	[illegible]
Sheridan av	10th av N	Farwell av	Macadam		30	32	1.35	1.35	106		[illegible]	[illegible]
Superior av	Hennepin av	Lyndale av	Creosoted wood		32	34	2.50	2.54	530		[illegible]	[illegible]
Superior av	Lyndale av	Bridge	Concrete		16	34	1.23	1.20	3,487		[illegible]	[illegible]
§Superior av	Brownie Lake	City limits	Concrete		16	34		1.50	[illegible]		[illegible]	[illegible]
§2d av N	Washington av	2d st N	Asphalt		50	50		.76	337		[illegible]	[illegible]
16th av N	Queen av N	Russell av	Macadam		30	32	1.66	1.66	330		[illegible]	[illegible]
3d av N	4th st N	5th st N	Creosoted wood		50	50	2.83	2.83	346		[illegible]	[illegible]
§3d st S	5th av S	7th av S	Asphalt		50	50		.68	658		[illegible]	[illegible]
10th av S	6th st	8th st	Creosoted wood	15.2	40 & 34.8	40 & 50	2.50	2.50	722	[illegible]	[illegible]	[illegible]
10th av N	Irving av	Knox av	Macadam		26	28	1.45	1.48	500		[illegible]	[illegible]
12th av N	Thomas av	Washburn av	Macadam		18	20	1.45	1.54	830		[illegible]	[illegible]
E 24th st	Clinton av	4th av S	Creosoted wood		28	30	2.52	2.46	272		[illegible]	[illegible]
E 26th st	Nicollet av	Park av	Creosoted wood		50&34,32 &32,34	50 & 34	2.38	2.37	3,087		[illegible]	[illegible]
§W 36th st	Hennepin	Lake Calhoun	Concrete		16			1.59	1,348		[illegible]	[illegible]
University av SE	Central av	1st av NE	Creosoted wood	5.1	50.9	56	2.35	2.35	105	[illegible]	[illegible]	[illegible]
§University av NE	1st av SE	3d av SE	Asphalt		40	40		.76	753		[illegible]	2,716.54
Upton av N	12th av N	Plymouth av	Macadam		28	30	1.53	1.54	482		[illegible]	2,151.73
Vincent av	12th av N	Plymouth av	Macadam		28	30	1.51	1.54	485		[illegible]	2,157.00
▲Washington av	3d av S	12th av S	Creosoted wood	15.2	48.5	64	2.60	2.60	3,699		[illegible]	[illegible]
Western av	7th st N	Railway bridge	Creosoted wood	15.2	26.8	42	2.10	2.10	1,837		[illegible]	12,630.20
Total									[illegible]	[illegible]	[illegible]	$456,773.95

*$6,697.27 from good roads.
†To be assessed in 1914.
‡Assessed in 1912.
§No assessment.
¶$2,250 from good roads.
●To be finished in 1914.
■$2,033 from good roads.
▲$19,975.7[illegible] from C. M. & St. P. Ry.

1914 annual reports

1915 annual reports

1916 annual reports

See Table on page 74 for new pavements in 1916.

2nd Ave N. – 1st Street N to 2nd Street N.: 4" creosote to replace (1904) sandstone on sand.

2nd Ave N. – Washington Avenue to 4th Street N.: 4" creosote to replace (1902) sandstone on sand.

3rd Avenue N. – 1st Street N to 2nd Street N.: granite to replace (1902) sandstone on sand.

Washington Avenue N.-- 3rd Avenue N to 24th Avenue N.: asphaltic concrete to replace (1901) brick from 3rd Avenue N. to 4th Avenue N. and (1900) from 8th Avenue N. to 14th Avenue N.

1917 annual reports

See Table on page 98 for new pavements in 1917.

4th Street N - 1st Avenue N. to 3rd Avenue N.: 4" creosote wood to replace sandstone on sand (1905).

1918 annual reports

See Table on page 74 for new pavements in 1918.

3rd Street N - 7th Avenue N. to 10th Avenue N.: 4" brick.

TABLE No. 6
PAVING LAID DURING THE SEASON OF 1918

STREET	FROM	TO	KIND	Width Paved by Street Railway Feet	Width Paved by City Feet	Width of Roadway Feet	Rate of Assessment Per Square Yard $	Cost Per Square Yard $	Length Paved in Feet	Square Yards Paved by Street Railway	Square Yards Paved by City	Cost of Paving Laid by City	Amount of Assessment
Alley in Aud. Sub. No. 30	12th st	Mary Place	3" Brick		20.0	20.0	3.01	$3.01	433.8		977.7	$2,941.51	$2,849.36
Alley bet. Emerson and Fremont	6th av N	11th av N	7" P. C. Concrete		16.0	16.0	2.25	2.31	1,614.5		2,858.2	6,454.90	6,178.80
Alley bet. Fremont and Girard	6th av N	11th av N	7" P. C. Concrete		16.0	16.0	2.25	2.14	1,644.3		2,912.5	6,077.49	6,374.20
Alley bet. Hennepin & Holmes	Lake st	31st st	7" P. C. Concrete		11.9	12.0	2.10	2.21	584.0		759.2	1,540.01	1,560.86
Alley bet. Humboldt & Irving	22nd st	24th st	7" P. C. Concrete		14.6	14.0		2.08	599.2		960.2	1,944.17	
Alley bet. Irving and James	28th st	29th st & James	7" P. C. Concrete		13.4	14.0	1.96	1.95	1,036.6		1,581.9	3,006.22	2,915.06
"A," "C," Cedar av	Lake st	38th st	3½"creosoted wood	15.2	22.8	40.0		2.91	5,259.7		13,063.7	37,982.83	25,113.87
"A," "C," Chicago av	24th st	Lake st	3½"creosoted wood	15.2	34.8	52.0		2.78	3,757.9		15,082.3	41,818.34	12,677.33
"B" Crystal Lake av	20th av N	26th av N	Asph.Con. Res'face		40.8 32.8	56.0 40.0							
					34.8	48.0	0.97	1.48	4,662.3		21,056.8	31,051.46	14,786.56
4th av S	28th st	Lake st	3½"creosoted wood	15.2	20.8	36.0	3.65	3.65	894.8	1,524.0	2,172.2	7,830.07	2,344.13
4th av S, widening	10th st S	22nd st E	4"creosoted wood		4.0	40.0	4.08	4.05			2,074.5	8,402.32	7,493.65
"C" 14th st W	Nicollet av	Willow st	3½"creosoted wood		36.3	32.0		2.67	854.9		2,983.8	7,960.37	7,087.54
First av NE	Univ. av NE	4th st NE	4" brick		9.8	40.0	3.15	3.86	339.9		367.0	1,415.51	1,353.00
Fifth av N	7th st	Royalston av	4" brick		34.0	36.0	2.93	2.98	414.1		1,858.4	5,533.10	4,618.54
"A" "C" Minnehaha av	Lake st	48th st	3½"creosoted wood	15.2	34.8	50.0		2.74	1,939.9		7,546.6	21,904.77	94,874.07
"A" 9th st S, widening	Hennepin av	Nicollet av	4"creosoted wood		29.6	51.0		3.20			2,835.7	9,070.51	
2nd av S	1st st S	Washington av	Granite		50.0	50.0	2.80	2.80	663.2		3,779.6	10,612.16	4,823.60
2nd st S	Marquette av	3rd av S	Granite		50.0	50.0	2.83	2.83	772.7		4,529.5	12,826.70	7,781.40
3rd av S	1st st S	2nd st S	4"creosoted wood		50.0	50.0	3.44	3.45	503.3		3,231.3	11,121.77	5,975.00
3rd st N	7th av N	10th av N	4" brick		50.3	52.3	2.94	2.94	1,455.2		8,556.8	25,136.08	20,905.11
10th av S	38th st E	40th N	7" P. C. concrete		30.0	32.0	Billed	3.05	37.5		125.0	381.37	
10th av SE	Como av	E Hennepin av	3" brick		21.0	40.0	3.01	3.09	1,248.1		2,665.8	8,223.75	5,689.4
"B" 20th av N	Lyndale av	Crystal Lake av	Asp.conc.Re'rface		40.8	56.0	0.97	1.48	2,525.1		11,961.4	17,638.42	9,377.97
23rd av NE	Filmore st	Johnson st	7" P. C. concrete		25.0	27.0	2.08	2.08	1,298.7		4,301.3	8,965.30	6,067.71
26th st E	Park av	Chicago av	3½"creosoted wood		32.0	34.0	3.44	3.44	572.3		2,230.1	7,671.00	6,080.77
"A," "C" 26th st W	Pillsbury av	Lake of the Isles	3½"creosoted wood		38.0 34.0	40.0 36.0		2.72	4,264.3		17,190.0	46,900.24	41,917.07
					32.0	32.0							
Washington av S	12th av S	Cedar av	3½"creosoted wood		48.8	64.0	2.82	2.82	1,327.0		8,045.8	22,670.52	10,365.03
"C" Yale Place	12th st S	Willow st	3½"creosoted wood		30.0	32.0	2.70	2.74	980.3		3,364.7	9,210.27	8,648.55

"A"—Ordered under the Elwell Law. "B"—One half of cost assessed by Resolution of Council "C"—Partly done in 1917.

1919 annual reports

See Table on page 79 for new pavements in 1919. See pavement map, page 22.

9th Avenue N.: Washington Avenue to 4th Street N.: 4" brick.

1st Street N – 1st Avenue N to 3rd Avenue N.: granite on concrete to replace (1885) granite on sand.

TABLE No. 6

PAVING LAID DURING THE SEASON OF 1919 AND ASSESSED IN TAXES OF 1919

STREET	FROM	TO	KIND	Width Paved by Street Railway Feet	Width Paved by City Feet	Width of Roadway Feet	Rate of Assessment Per Square Yard	Cost Per Square Yard	Length Paved in Feet	Square Yards Paved by Street Railway	Square Yards Paved by City	Cost of Paving Laid by City	Amount of Assessment
Alley Between	Park & Columbus	32st to 33st	Concrete		12.0	12.0	$2.64	$2.64	533.1		718.1	$1,895.8	$1,810.16
Alley between	Park & Oakland	32st to 33rd	Concrete		12.0	12.0	2.64	2.64	620.9		840.3	2,218.39	2,093.00
Cedar Av	48th st	52nd st	Concrete		36.0	40.0	1.78	1.78	2,742.5		10,922.8	19,396.25	8,817.41
(a) (d) Cedar av	38th st	48th st	3¼" Creosoted wood		22.0	40.0	4 00	5.13	6,481.0		14,689.3	74,031.93	49,326.37
Central av	Main st	2nd st SE	3½ Creosoted wood		56.0	56.0	3.98	3.98	391.2		2,495.8	9,934.79	7,291.82
Emerson av	5th av N	Plymouth av	Asphaltic concrete		30.0	32.0	2.38	2.38	3,280.6		11,787.0	28,086.76	24,352.63
(b) (d) 8th av NE	2nd st NE	5th st NE	3½" creosoted wood		34.0	36.0	4.0		763.0		3,040.3	13,100.33	13,839.91
(b) (c) (d) (f) 8th st S	Henn. av	Nicollet av	3½" creosoted wood		22.2	48.0	3.00				1,358.3	3,844.64	15,277.70
18th av N	Wash. av N	2nd st N	Concrete		30.0	32.0	2.13	2.13	319 0		1,202.5	2,567.62	2,414.92
1st st	3rd av N	6th av S	Gran. on Concrete		Irregular	Irregular	3.20	3.18	3,363.0		16,440.4	52,190.19	43,276.27
1st av S	Grant st	22nd st	3½" creosoted wood		30.0 32.0	32.0	3.66	3.71	3,109.0		11,746.1	43,537.31	35,130.24
4th st	1st av N	4th av S	3½" creosoted wood	15.2	50.0 34.8 52.2	52.2 50.0	3.22	3.22	2,286.0		11,674.3	37,581.09	27,445.42
15th av NE	Quincy st	Jackson st	3½" creosoted wood		36.0 47.2	36.0	3.65	3.65	310.5		707.7	2,577.37	2,444.04
Hennepin av	Washington av	10th st	3½" creosoted wood	15.2	48.8 24.0	64.0 26.0	3.12	3.12	3,153.0		17,939.1	55 951.16	43,509.73
(b) (c) Humboldt av N	6th av N	Plymouth av	Concrete		34.0	36.0	2.30		1,963.8		5,834.0	12,165.36	11,630.00
Jackson st	15th av NE	15th av NE	3½" creosoted wood		38.0 16.0	38.0 16.0	3.65	3.65	147.4		572.8	2,083.08	1,864.27
Jewett Pl	6th av N	11th av N	Asphaltic concrete		22.0	24.0	2.73	2.73	1,688.6		3,877.6	10,556.74	9,813.25
(b) (d) Johnson st	Lowry av	29th av NE	3½" creosoted wood		19.0	40.0	4.00		2,000.0		4,740.3	20,545.09	19,303.33
(b) (c) (d) (f) Mary Place	8th st S	Vine Place	3½" creosoted wood		Irregular 40.0	50.0	3.00				4,261.4	14,611.96	37,563.00
9th av N	Washington av	4th st N	Brick		38.0 39.0 28.2	40.0	3.35	3.35	658.0		2,952.4	9,885.88	8,243.54
Oak st	Wash. av SE	Univ. av SE	3½" creosoted wood		38.3	43.5	3.92	3.92	666.0		2,011.6	7,881.78	5,032.67
Portland av	27th st	Lake st	3½" creosoted wood		38.0	40.0	3.67	3.67	1,804.0		7,844.7	28,752.50	25,661.90
(c) Plymouth av	Humboldt av	Penn av N	3½" creosoted wood	15.2	32.7	49.9	3.90	3.60	2,568.0		10,397.3	37,366.78	26,631.60
(b) Quincy st	Broadway	15th av NE	Brick		28.0 38.0	30. 40.0	3.33		306.8		1,348.3	19,151.01	19,033.40

CITY OF MINNEAPOLIS

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1920 annual reports

See Table on page 15 for new pavements in 1920.

10th Avenue N – 3rd Street N to 5th Street N.: 4" VF brick to replace (1892) cedar block.

1921 annual reports

See Table 8 on page 16 for new pavements in 1921.

1st Street N. - 3rd Avenue to Plymouth: placed re-cut granite and replaced granite on sand.

4th Avenue N. - 2nd Street to Omaha ROW : placed re-cut granite and replaced granite on sand.

3rd Street N. - 3rd Avenue N. to 3th Ave S.: replaced asphalt with 3.5" creosote block.

1922 annual reports

See Table 5 on page 98 for new pavements in 1922.

1st Street N. - 3rd Avenue to Plymouth: placed re-cut granite and replaced granite on sand. Same project as in 1921:

- (1891) granite on sand
- (1906) sandstone on sand
- (1915) sandstone on sand
- (1922) granite on concrete

2nd Street N - Hennepin Avenue to 1st Avenue N.: re-cut granite on concrete from granite on sand

1st Avenue N - Washington Ave to 7th Street:

- (1904) sandstone on sand
- (1914) Asphalt resurface
- (1922) 3.5" wood block

2nd Avenue N - 5th Street N to 7th Street N:

- (1901) 6th to 7th street - brick
- (1904) 5th to 6th street - brick
- (1922) 4" brick

1923 annual reports

See Table 8 on page 184 for new pavements in 1923.

5th Street N. - 1st Avenue N to Hennepin Avenue: 3.5" creosote block from (1896) asphalt on concrete base.

5th Street N. - Washington Ave to RR bridge: 3.5" creosote block from (1904) sandstone on sand.

2nd Street N. - 1st Avenue N to RR Bridge: re-cut granite from (1905) sandstone on concrete.

1924 annual reports

See Table on page 14 for new pavements in 1924.

No significant pavement replacement in project area.

1925 annual reports

See Table on page 108 for new pavements in 1925.

2nd Avenue N – 7th Street N to 8th Street N.: creosote block and brick.

2nd Street N – 715' north of 5th Avenue to 1515' north of 5th Avenue: granite.

1926 annual reports

See Table on page 196 for new pavements in 1926.

4th Street N – Bridge over tracks to 6th Avenue N.: 4" brick to replace (1910) sandstone block.

5th Avenue N – 4th Street N to 5th Street N.: 4" brick.

5th Avenue N – 2nd Street N to alley between 2nd Street and Washington Avenue: 4' brick to replace (1903) sandstone blocks.

6th Avenue N – Washington Avenue to 5th Street N.: 4" brick to replace (1911) sandstone blocks.

Alley bet. 11th av S and 12th av S	36th st	37th st	7" concrete		12.0	12.0	2.52	2.52	244.8	330.7	833.47	771.70
Alley bet. Lake st and 31st st	Bloomington av	16th av S	7" concrete		12.0	12.0		2.86	278.8	378.1	1,000.36	*1,001.20
Alley bet. Humboldt av S and Irving av S	26th st	27th st	7" concrete		14.1	14.0	2.63	2.63	684.9	1,082.8	2,843.42	2,721.15
Alley bet. 27th av S and 28th av S	Lake st	31st st	7" concrete		16.5	16.0	2.64	2.64	489.4	911.5	2,401.49	2,292.22
Alley bet. 29th av S and 30th av S	Lake st	End of alley	7" concrete		16.6	16.0	2.79	2.69	354.4	633.7	1,757.01	1,725.43
Alley bet. Minnehaha av and 34th av S	37th st	34th av S	7" concrete		14.0	14.0	2.79	2.70	541.4	845.4	2,281.00	2,155.89
Alley bet. 44th av S and 45th av S (i)	34th st	35th st	7" concrete								**295.00	2,548.88
Broadway st N E (a)	Johnson st	Wilson st	4" brick	No. 1,235—20 yrs.	38.0	40.0		5.24	1,436.3	6,405.5	28,617.53	
4th st N	Bridge over tracks	6th av N	4" brick	No. 1,320—20 yrs.	36 & 42.5	36 & 42.5		4.13	686.3	3,377.9	13,959.23	
4th st S E (b)	Central av	2nd av S E	4" brick		10.0	50.0	6.67	6.71	364.5	435.9	2,926.12	2,592.00
4th st S E and Oak st (c)	15th av S E	University av	Creosoted blocks	No. 1,191—20 yrs.	3.0					495.9	4,079.92	
5th av N	4th st	5th st	4" brick	No. 1,236—20 yrs.	48.0	50.0		4.36	349.6	1,871.7	8,164.08	
5th av N	2nd st	Alley bet. Wash. and 2nd st	4" brick		50.0	50.0	5.13	5.13	143.3	909.9	4,668.59	4,617.00
15th st N	Laurel av	Hawthorne av	3" brick		30.0	32.0	3.60	3.60	305.1	1,022.7	3,681.70	3,600.00
41st st E	42nd av S	46th av S	3" brick	No. 1,414—20 yrs.	19.6	40.0		3.89	1,207.3	3,143.5	12,246.25	
43rd st W	Upton av	Vincent av	Asph. Con	No. 1,332—10 yrs.	39 & 28	30 & 41		2.87	565.5	1,395.3	3,998.73	
Hennepin av E	16th av S E	25th av S E	A. C. Re-Surf	No. 62—20 yrs.	25 & 40	40.0		2.37	2,340.8	9,573.5	22,680.40	
Hennepin av and Lyndale av (d)	Oak Grove st	Groveland av	4" brick		24.0	Indef.			603.0	1,579.6	11,700.41	
Hennepin av (e)	At Bridge Square		4" brick		83.0	Indef.	3.42	3.42	78.6	591.2	2,021.18	1,701.90
Holmes av	Lagoon av	Lake st	Asph. Con		30.0	32.0	2.15	2.15	272.4	857.5	1,839.96	1,809.36
Humboldt av N	26th av N	Lowry av	Asph. Con	No. 1,432—20 yrs.	30.0	32.0		2.21	2,565.4	8,932.8	19,744.86	
Lowry av N	Washington av N.	River bridge	A. C. Re-Surf		41.0	40.0	1.85	1.85	1,426.8	6,559.1	12,157.94	10,226.09
Nicollet av (f)	48th st	50th st	Creosoted blocks	No. 679—20 yrs.	3.0					357.0	2,684.47	
Park av	14th st	28th st	A. C. Re-Surf		36.0	36.0	1.55	1.55	6,255.1	28,083.4	43,603.17	33,732.44
Pleasant av	26th st	Lake st	Asph. Con	No. 1,417—10 yrs.	28.0	30.0		2.30	2,396.4	7,839.5	17,979.87	
Riverside av	27th av S	Franklin av	Asph. Con	No. 1,425—20 yrs.	48.0	50.0		2.22	815.8	4,639.7	10,318.00	
Sheridan av	Lake Calhoun Blvd	W 40th st	Asph. Con	No. 1,362—10 yrs.	30.0	32.0		2.21	1,285.7	4,454.9	9,826.71	
2nd st S E	Central av	2nd av S E	4" brick		38.0	40.0	4.05	4.05	339.3	1,510.8	6,123.71	5,632.74
6th av N	Washington av N.	5th st	4" brick	No. 1,489—20 yrs.	50.0	50.0		4.44	970.1	5,496.8	24,404.95	
16th st N	Hennepin av	Hawthorne av	3" brick	No. 1,456—20 yrs.	30.0	32.0		3.47	713.4	2,396.7	8,323.98	
10th st N (g)	Hennepin av	Angle bet. Hawthorne and 1st av N	4" brick	No. 1,310—20 yrs.	14.0	46.0			427.0	871.7	5,086.49	
13th av N E	River bridge	Ramsey st	4" brick re-surf		26 to 30	43.0	3.10	3.07	630.9	2,168.3	6,852.81	5,768.74
21st st W	Penn av	Thomas av	Asph. Con	No. 1,412—10 yrs.	30.0	32.0		2.15	1,379.8	5,126.3	11,026.57	
25th st E	Columbus av	Chicago av	Asph. Con		24.0	26.0	2.47	2.47	326.8	1,068.2	2,562.14	1,703.52
26th av S	29th st	Minnehaha av	Creosoted blocks	No. 1,305—20 yrs.	46.0	48.0		4.21	233.7	1,197.3	5,038.40	
31st st E	28th av S	Minnehaha av	Asph. Con	No. 1,413—10 yrs.	38.0	40.0		3.10	344.7	1,542.9	4,783.82	
38th av N	Penn av	Thomas av	3" brick	No. 1,314—20 yrs.	20.0	40.0		4.04	1,303.3	3,278.2	13,256.00	

1927 annual reports

See Table on page 286 for new pavements in 1927.

5th Avenue N – 3rd Street N. to 4th Street N.: 4" brick.

5th Street N – R RY Bridge to 6th Avenue N.: 4" brick.

TABLE NO. 7

PAVING LAID DURING THE SEASON OF 1927

STREET	FROM	TO	KIND	Elwell Law Number and Assessment Term	Width Paved by City —Feet	Width of Road-way—Feet	Rate of Assessment Per Sq. Yard	Cost Per Sq. Yard	Length Paved in Feet	Square Yards Paved by City	Cost of Paving Laid by City	Amount of Assessment
3rd av S	34th st E	38th st E	Asphaltic con	No. 1,482—10 yrs.	28.0	30.0	$2.70	$2.39	2,573.2	8,403.9	$20,084.98	13,389.98
Portland av	34th st E	38th st E	Asphaltic con	No. 1,488—10 yrs.	38.0	40.0	2.70	2.28	2,575.5	11,430.3	26,111.91	17,407.46
42nd st E	Cedar av	Minnehaha av	3" brick	No. 1,487—20 yrs.	38.0	40.0	4.00	3.79	7,192.0	21,146.5	80,225.26	53,483.50
Hoag av N	5th av N	6th av N	3" brick	No. 1,457—20 yrs.	34.0	36.0	4.00	3.99	350.6	1,393.8	5,566.43	3,710.94
University av N E	Lowry av N E	R. Ry. Bridge	3" brick	No. 1,469—20 yrs.	30.0	32.0	4.25	3.48	2,241.0	7,763.1	27,037.34	18,024.88
Girard av N	26th av N	Lowry av N	Asphaltic con	No. 1,561—10 yrs.	30.0	32.0	2.50	2.44	2,566.4	8,901.0	21,701.25	14,467.50
5th av N	3rd st N	4th st N	4" brick	No. 1,236—20 yrs.	48.0	50.0	4.00	4.73	320.3	1,791.6	8,750.45	5,833.62
5th st N E st 22nd av N E			Asphaltic con	No. 1,460			3.60	3.52	148.6	609.2	2,502.73	1,668.48
10th st S	Nicollet av	Hennepin av	3" brick	No. 1,310	10.0	45.0	8.16	8.16	709.2	1,178.5	9,619.61	6,413.06
28th av S	38th st E	42nd st E	3" brick	No. 1,094	3.4	40.0	2.33	2.33	2,715.0	1,025.7	2,384.55	1,589.70
Alley, Snyder & Co's 1st Add Blk 13	Marquette av	End	4" brick		16.0	16.0	4.76	4.89	324.4	576.7	2,819.86	2,622.71
Stevens av	24th st E	25th st E	2" asphaltic con		34.0	36.0	2.50	2.47	625.2	2,362.2	5,843.63	2,925.46
25th st E	Stevens av	3rd av S	2" asphaltic con		30.0	32.0	2.50	2.49	602.7	2,101.7	5,234.63	2,190.08
Hennepin av	25½ st W	26th st W	3" brick		5.0	50.0	7.42	8.16	268.5	155.5	1,350.09	1,228.05
Reservoir Blvd	850' N of 37th av N E	Reservoir	Mac. and 3" brick		11.0				4,909.1	5,950.9	47,717.38	47,717.38
					20.0	34.0	2.59	2.59	4,965.8	12,501.7		
5th st N	R. Ry. Bridge	6th av N	3" brick		38.0	52.0	4.50	3.46	602.1	3,026.5	10,469.57	
9th st S	Marquette av	4th av S	3" brick		10.0	50.0	8.51	8.51	1,028.2	1,227.1	10,441.51	8,908.20
Huron av	Hennepin av	Lyndale av	3" brick		18.5	50.0		6.48	238.3	505.1	3,270.30	
31st st W	Hennepin av	Irving av S	Macadam		33.0	56.0	1.75	1.75	974.3	4,628.4	8,103.79	8,103.79
Elliot av	29th st E	Lake st E	2" asphaltic con		28.0	30.0	3.45	3.45	623.4	1,857.3	6,403.87	6,403.87
10th av S	29th st E	Lake st E	2" asphaltic con		30.0	32.0	3.08	3.08	605.1	2,604.5	8,019.77	5,346.50
29th st E	Elliot av	Alley bet. Elliot and Chicago	2" asphaltic con		28.0	30.0	2.64	2.64	138.5	447.9	1,182.53	1,182.53
Alley bet. 27th and 28th av S	40th st E	41st st E	7" concrete		14.3	14.0	2.62	2.62	626.1	1,003.2	2,633.22	2,155.05
Alley bet. 39th and 40th avs S	34th st E	35th st E	7" concrete		14.0	14.0	2.92	2.92	623.3	1,045.3	3,054.71	2,664.75
Alley bet. 46th and 47th avs S	33rd st E	34th st E	7" concrete		12.1	12.0	1.90	1.86	629.0	845.6	1,572.07	1,339.60
Alley bet. 31st and 32nd avs S	45th st E	46th st E	7" concrete		14.0	14.0	2.57	2.62	629.5	982.6	2,577.34	2,331.20
Alley bet. 44th and 45th avs S	35th st E	36th st E	7" concrete		14.0	14.0	2.60	2.59	627.1	975.9	2,528.64	2,413.26
Alley bet. 40th and 41st avs S	34th st E	35th st E	7" concrete		14.0	14.0	2.92	2.92	913.3	984.3	2,760.40	2,644.55

1928 annual reports

See Table on page 373 for new pavements in 1928.

No significant pavement replacement in project area.

1929 annual reports

See Table on page 12 for new pavements in 1929.

6th Avenue N – Washington Avenue to Washington alley west: 3" brick.

STREET	FROM	TO	KIND	WIDTH PAVED CITY FEET	WIDTH ROAD-WAY FEET	RATE ASSM'T SQ.YD.	COST PER SQ.YD.	LENGTH PAVED FEET	SQ.YDS. PAVED BY CITY	COST PAVING LAID BY CITY	AMOUNT ASSM'T
E. Bloomington Av.	½ way bet 42 & 43rd St.	M'haha E. Pkwy	3" Brick	13	44			4,651.6	6,204.4	25,897.36	* * *
E. W. Broadway	Penn Av. N.	W. City Limits	2" A.C.	16	56	5.50	5.50	3,367.5	7,386.6	40,658.05	37,682.40*
E. Chicago Av.	44th St. E,	M'haha Blvd.	3" Brick	35	52	3.50	3.50	4,248.4	15,863.1	55,528.09	46,372.37
Colfax Av.N.	Hawthorne Av.	Laurel Av.N.	7" Concrete	45	32	3.26	3.26	289.5	1,431.3	4,666.79	4,260.56
4th St. S.	5th Av. S.	8th Av.S.	3" Brick Resurf.	35	50	2.61	2.61	1,188.1	4,922.5	12,832.27	9,694.35
E.W. 44th St.	Upton Av.	France Av.	2"A.C.	34x40	36x40	2.31	2.31	3,619.3	15,138.8	34,902.40	26,079.60
E.E. 46th St.	M'haha Av.	46th Av.S.	2" A.C.	54	56	2.61	2.61	1,782.2	11,703.2	30,550.43	11,684.40
E. 10th St. S.	Nicollet Av.	Marquette Av.	3" Brick	14	54	9.10	9.10	332.6	580.5	5,282.69	3,157.40*
E. 28th Av. S.	E. 42nd St.	M'haha Blvd.	3" Brick	20	40	4.02	4.02	3,676.1	8,457.3	34,025.94	27,261.73
E. 34th Av. S.	M'haha Blvd.	51st St. E.	3" Brick	23	40	3.54	3.54	1,920.0	5,185.7	18,332.80	14,106.80
E. 36th St.	Lyndale Av.S.	Chicago Av.	2" A.C.	30	32	2.41	2.41	6,304.6	23,871.9	57,566.73	41,451.40
E. W. 39th St.	Richfield Av.	Clowen Av.S.	2" A.C.	30	32	3.57	3.57	3,316.7	12,603.5	45,022.02	34,823.74
E. Park Av.	34th St. E.	38th St. E.	2" A.C.	34	36	2.38	2.38	2,515.5	9,908.0	23,617.78	21,851.96
46th Av. S.	46th St. E.	Godfrey Road	3" Brick	36	40	3.53	3.53	448.5	2,206.6	7,787.49	Not Ass'd.
Lyndale Av. S.	Superior Av.	Vineland Place	3" Brick	54x56	54x56	2.09	3.70	1,101.0	7,157.7	26,453.69	5,064.82
E. 25th St. W.	Pleasant Av.	Lyndale Av.	2" A.C.	28	30	2.39	2.39	1,241.4	4,325.9	10,350.97	7,327.50
6th Av. N.	Washington Av.	Alley-West	3" Brick	50	50	4.18	4.18	166.1	975.2	4,080.09	3,994.33
E. University Av. S.E.	24th Av.	St. Marys Av.	3" Brick	27	70	4.70	4.70	1,508.2	5,358.7	25,209.50	21,854.52**
E. University Av. S.E.	St. Marys Av.	E. City Limits	3" Brick Resurf	54	70	3.42	3.42	2,833.8	18,166.7	62,065.98	52,510.52
		Total						44,511.1	161,447.6	$524,761.07	

Note:
* Widening
** Job Started in 1928 and Completed 1929.
*** To be completed 1930.
E. Elwell Jobs.

12

1930 annual reports

See Table on page 99 for new pavements in 1930.

5th Street N – 6th Avenue N to 11th Avenue N.: 2" asphaltic concrete.

5th Avenue N – Washington Avenue to 3rd Street N.: 4" brick.

1930 con't

STREET	FROM	TO	KIND	WIDTH PAVED BY CITY FEET	WIDTH ROAD-WAY FEET	RATE ASSMT SQ.YD.	COST PER SQ.YD.	LENGTH PAVED FEET	SQ.YDS. PAVED BY CITY	COST PAVING LAID BY CITY	AMOUNT ASSM'T
Aldrich Av. S.	Lincoln Av.	Franklin Av.	2" A.C.	28.0	30.0	2.55	2.52	564.7	1760.9	4432.07	4760.00
Aldrich Av. N.	2nd Av. N.	Glenwood Av.	3" Brick	30.0	32.0	5.31	5.31	165.5	564.4	2996.38	2799.30*
E. Bloomington Av.	40th St. E.	½ way bet 42& 43 St.	2" A.C.mac	12.0	42.0	2.13	2.13	1589.5	7959.6	8613.41	
E. Bloomington Av.	½ way bet 42&43 St.	M'haha Blvd.	3" Brick	12.8	44.0	3.99	3.99	3651.5	5058.1	20181.02**	
Bryant Av.S.	Lincoln Av.	Douglas Av.	2" A.C.	34.0	36.0	2.55	2.37	659.8	2617.2	6204.96	5784.48
E. Broadway St.	N.E.Mississippi River	Main St. N.E.	3" Brick	40.0	40.0	5.55	5.55	1247.2	6588.0	33330.39	
E. Broadway St.	N. Penn Av. N.	City Limits	2" A.C. (Widen)	9.2	56.0	5.55	5.55	155.9	170.0	943.28	
E. Bryant Av. S.	26th St. E.	29th St. E.	2" A.C.	28.0	30.0	2.16	2.16	1785.0	5689.4	12316.65	
Central Av. N.E.	13th Av. N.E.	18th Av.N.E.	2" A.C. (Resurf)	44.8	60.0	1.12	1.12	1822.1	9248.8	10320.58	9539.04*
E. Cedar Lk Road	Penn Av.	Superior Av.	2" A.C.	32.0	34.0	2.56	2.56	2149.9	8245.2	21115.09	
Elliott Av. S.	28th St. E.	29th St. E.	2" A.C.	30.0	32.0	2.40	2.40	520.1	1730.7	4150.41	4072.00
E. Elliott Av. S.	Franklin Av.	24th St. E.	2" A.C.	30.0 (34.0	32.0 36.0	2.27	2.27	1242.4 1573.3)	4461.3	10110.76	
Emerson Av. S.	Mt. Curve Av.	24th St. W.	2" A.C.	(24.0	30.0	2.41	2.41	1198.5)	9397.1	22642.06	18857.93*
Emerson Av. N.	Lowry Av. N.	33rd Av. N.	3" Brick (Header)	3.4	43.0	3.84	3.84		259.1	995.14	472.80* ***
Elroy St.	Blaisdell Av.S.	Pleasant Av. S	3" Brick	30.0 (40.0	32.0 40.0	3.54	3.54	731.9 806.0)	2569.0	9093.00	6872.25*
8th St. S.	11th Av. S.	15th Av. S.	2" A.C.	(30.0	32.0	2.24	2.24	764.2)	6517.7	14611.11	12015.37*
11th St. N.	Glenwood Av.	Holden St.	3" Brick	30.0	32.0	4.15	4.16	311.8	1071.0	4459.80	4152.00
1st Av. N.	12th St. N.	M.St.L.R.R.	3" Brick	30.0	32.0	3.95	3.95	442.1	1523.7	6017.35	5533.78
5th	Washington Av.	3rd St. N.	3" Brick (Resurf)	35.0	50.0	2.93	2.93	322.4	1225.3	3591.85	3589.92
E. 4th Av. S.	50th St.	3rd Av. S.	2" A.C.	14.0	20.0	2.15	2.15	1002.4	2170.1	4665.96	
E. 42nd Av. S.	42nd St.	46th St. E.	2" A.C.	30.0	32.0	2.27	2.27	2585.4	9006.6	2046.42	

1931 annual reports

See Table on page 9 for new pavements in 1931.

No significant pavement replacement in project area.

3rd Avenue N. – 2nd Street N. to 5th Street N.: 2" asphaltic concrete.

3rd Avenue Bridge.: 2" asphaltic concrete.

1933 annual reports

See Table on page 17 for new pavements in 1933.

1st Avenue N. – Washington Avenue to 9th Street N: brick header with 2" asphaltic concrete.

2nd Street N. – 10th Avenue N to Broadway: 5' brick gutter with 2" asphaltic concrete.

1934 annual reports

See Table on page 92 for new pavements in 1934.

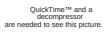
No significant pavement replacement in project area.

Findings and Recommendations.

A. Best practices involving the preservation and reparation of historic street materials including clay, wood, and granite pavers.

1. Identification of brick, granite or wood streets as contributing resources to historic infrastructure in Minneapolis.

Portland, OR.
In 1978 the City of Portland passed an ordinance stating that cobblestones located in City Streets have historical significance. (see below).



. 50 streets, about 25 must be replaced/fixed when problems occur, utilities are cut in, etc. The other 25 streets are “cut up real bad” hence the city does not require that the stones/cobbles be replaced.

Wichita, KS.
Originally, Wichita’s listed historic districts did not identify the brick streets as character defining features and citywide ordinances, zoning codes, and/or regulations did not mandate that brick streets be retained. In the mid 1990s, an overlay zoning district was placed upon Old Town; brick streets were then identified as character defining features of the district. After the Old Town overlay district was created, design guidelines were adopted for said area. Now, any project in Old Town has to be reviewed against design guidelines, and the remaining brick streets are now considered a contributing resource to the City.

Regarding evaluation, the Historic Preservation Office of Wichita evaluated all brick and brick paved streets from a list provided by Public Works.

Philidelphia, PA.
In 1998, Philadelphia created a Historic Street Pavers District, designating all streets containing at least 30% of original, exposed, historic street paving materials (cobbles, granite pavers, bricks, or blue stone). Originally a non-profit inventoried the streets, surveying 326 blocks. The designation encompasses about 56 streets and includes the cartway only (not curbs or sidewalks; Philadelphia Street Department maintains the

streets, while curbs and sidewalks are the property of the building owner; Philadelphia felt it would be too hard to regulate sidewalks and curbs).

2. Creation of a 'Historic Street Materials Plan.' – examples and verbage drawn from 'Brick Streets Plan,' Rock Island, IL (Appendix C).

A Historic Street Materials plan should be created for the purpose of preserving the remaining clay, wood, and granite paver streets. Streets constructed of historic pavers are an asset to the community and provide a very real sense of time and place. The longevity of Minneapolis' remaining paver streets attests to their durability and economic value.

First, existing brick streets shall be identified (Appendix D). Then, these streets shall be analyzed in terms of condition of the paving and architectural and structural condition of the buildings abutting them. With assistance from the Public Works Department, utilities and street standards shall be identified. Streets containing extant historic street materials shall then be evaluated on crown condition, drainage problems, base condition, rideability, percentage of streets patched and finally be categorized.

Recommended Categories:
Category 1: Restore to original appearance
Category 2: merit preservation, but not so important as to merit restoration
Category 3: streets should go to the Minneapolis Heritage Preservation Commission for further comment before resurfacing or repairs commence due to the questionable potential for preservation.
Category 4: Resurfacing and patching with materials other than brick are allowed on these streets

Once streets with historic streets materials are categorized, a prioritization list for public and private entities should be created. The Prioritization List would act as a handy, short-form of the Historic Street Materials Plan. This list should include all of Minneapolis' paver streets, their prioritization for preservation in categories one through four, and some short explanations about the intent of preservation for each category.

Along with categorization, policies to ensure the preservation of the surface of category one and category two brick streets shall be implemented.

Example Repair Policy (adapted from 'Brick Streets Plan' Rock Island, IL)

The City Engineer shall mandate that all surfaces disturbed by utility cuts for categories one through two streets be replaced in brick. This repair policy may be limited to utility cuts, which excavate the surface of the street. Asphalt or concrete fill are permitted when dips or holes occur through underground, natural or wearing circumstances. The City has an obligation to eradicate unsafe situations. If existing utility patches are re-excavated on category one and category two streets, they must be replaced with brick if some portion of the newest excavation touches brick.

Simultaneously, the Public Works Department will continue an active salvage operation of street brick just for repair purposes. In addition, adjacent road repair which may impact the edges of brick streets near intersections is reviewed by the Heritage Preservation Commission if the affected street is category one, two or three.

Example Utility Cuts (adapted from Rock Island, IL policy)

Utility cuts are the most common surface disturbance in local streets.

The excavation of utility cuts may be made by private contractors after receiving a city permit. However, patching the utility cut shall be accomplished by city-contracted crews, with the person who caused the utility cut reimbursing the city for the cost of the resurfacing. The resurfacing material (concrete, asphalt or brick) and cost are determined by the City's Engineering Division through referencing the Historic Street Materials Plan.

Example Long Term Maintenance Policy (adapted from Rock Island, IL policy)

In a survey conducted in February 2000 of 25 other Illinois and Iowa communities (Appendix E), Rock Island's Planning & Redevelopment Division staff found that those handful of cities that were proactively repairing brick streets (Champaign, Davenport and Galesburg) had special set-asides in their street repair budgets.

With the completion of a Historic Street Materials Plan, City Council shall approve a new maintenance budget to be specifically targeted for streets composed of clay, wood, or granite pavers. A certain percentage of the annual budget for street maintenance will be set-aside to remove patches and potholes, level surfaces and generally do surface improvements that would improve the rideability and appearance of brick streets.

B. Techniques and associated costs to properly remove, clean, and reset historic paving materials.

Remove.

The clay, wood, and granite pavers on all identified streets may be salvaged with varying degrees of success and loss due to age, wear, composition, and removal process. Every contractor contacted utilized mechanical equipment in the paver removal process.

Carl Bolander and Sons typically uses backhoes and skidsters to remove pavers, then proceeded to palletize the bricks. L.P.S. Paving "pops up" bricks with a fork or pick, hand removes the bricks from ground, and then palletizes bricks. Glacial Ridge (GR) begins the process by handpulling a few pavers to examine the quality and strength of the pavers. If the bricks appear to have not too much moisture and/or deterioration, then Glacial Ridge will use a bobcat to lift and dump bricks. Next, workers clean the bricks before they are palletized. If the bricks appear fragile at the initial removal, GR will handpull the bricks. Al Lotthammer warns against reusing fragile bricks explaining that

if the bricks are too fragile to remove with a machine, they likely will not hold up to the re-installation process of being mechanically repacked.

Glacial Ridge estimated that 60-80% of bricks are salvageable depending on the setting method used, the fragility of bricks, and the texture of said bricks.

Clean.

All for-profit contractors contacted by Ms. Lindberg said cleaning method was basically "clapping" the bricks together to clean off dirt and related debris.

Glacial Ridge stated that cleaning the bricks becomes a cost function. If bricks need to be hand scraped, workers will use a putty knife to clean the joints. Texture on the side of the bricks adds a variable. Hand scraping becomes very expensive as the "scrapers" are paid common labor rate. Glacial Ridge does not use Youth Labor or associated programs.

"The City of Minneapolis and Carl Bolander and Sons Contractors have used youth labor to clean brick…Minneapolis organized youth crews from public housing projects to clean bricks for the Main Street reconstruction. This program proved to be very successful. The crewmembers were paid approximately $6.00 per hour which worked out to $0.17-$0.20 per brick. The best of the cleaning crews were retained to lay the bricks in the sidewalks."[1]

Re-set.

Following excepts are taken from Dahlgren, Shardlow, and Uban, Inc. Grand and St. Albans Sewer Separation Project. Ramsey and Crocus HIll Street Replacement Project. Rep. St. Paul, 1993. Print.

> "There are three basic systems that could be used for reconstructing the brick and cobbles streets. The construction methods vary mostly in the type of base materials that are used. All of the systems will work, however, each has pros and cons, which are outlined below. Cross sections of the different methods are illustrated on the following pages as well as cost comparisons between the systems as applied to each street.
>
> METHOD 1: DRY LAID OVER CRUSHED STONE BASE.
>
> This system entails placing a thick, compacted 100% crushed limestone base over a compacted subgrade. A soil separating fabric should be used between the subgrade and the crushed limestone base to prevent migration of the base material into the subbase. The bricks are laid over a sand setting bed, sand is swept into the joints and vibrated into place.

[1] Dahlgren, Shardlow, and Uban, Inc. *Grand and St. Albans Sewer Separation Project. Ramsey and Crocus HIll Street Replacement Project.* Rep. St. Paul, 1993. Print.

The base thickness will vary depending on the condition of the sub-base and the load bearing capacity desired for the street. It is important to use 100% crushed limestone for the base because of its binding characteristics. Dry mortar or powdered clay may also be added to the sand to fill the joints. This will keep the sand from migrating out of the joints, create a stronger bond, and promote positive drainage. Powdered clay has an advantage over dry mortar because it will not stain the pavers.

Pros.
This method is the most simple to construct, the most cost effective over time, is historically correct and recommended the most by the street contractors we surveyed for use with used bricks and cobbles. Unlike new bricks, cobbles and used bricks cannot be laid with tight joints and water will percolate into the base. Dips and birdbaths can be easily repaired by crews trained in placing pavers. To repair, bricks are simply removed with a prost, the reason for the base deterioration should be fixed, more stone base is added and compacted and the bricks tamped back into place. This system also adapts to varying sizes of cobbles better than other systems.

If the base is constructed properly it will not deteriorate as quickly as asphalt or concrete. Water can percolate from this system. With the use of bituminous or concrete, moisture is more apt to be trapped, displace sand, freeze and deteriorate the base and driving surface. The used bricks and cobbles are also becoming hard to find. With this system, if repairs need to be made, the bricks will not be full of asphalt and will be easy to reuse.

Cons.
The perception is that this is an old method and that the load capacities necessary for large trucks cannot be attained. This simply is not the case. The base thickness can be designed to provide the equivalent stone base thickness to asphalt. This will result in a thicker base (12 to 20 inches) than the other methods.

The success of this method is dependent on the quality of the base construction. Special attention must be paid to maintaining adequate and consistent compaction and base thickness. This method will result in a durable street. However, some minor rutting may occur overtime if the base is not designed properly and thoroughly compacted.

METHOD 2: DRYLAID OVER A BITUMINOUS BASE

This method entails basically building a bituminous street underneath the brick-driving surface. The bricks can be set in either a sand setting bed or a neoprene modified asphalt adhesive over an approximately 3 inch thick bituminous base. A sand and dry mortar mix is then swept into the joints.

This system has been utilized recently in St. Paul around Rice Park and for Main St. and the crosswalk in front of the Walker Art Center in Minneapolis.

Pros.
This system works well for use under streets paved with new bricks where the bricks are dimensionally consistent, joints are tight and water surface drains fairly well. The costs of bituminous are not that different from the costs for a thicker crushed stone base and the loading capacities are easily achieved in a thinner cross section.

This system is easy to repair if the bricks are placed in a sand bed versus a neoprene adhesive. The bituminous bed can be cut and patched relatively easily if utility or other repairs are needed

Cons.
The disadvantages of using this system with old used bricks are that tight joints are difficult to achieve and water will percolate through the bricks, pool, freeze and pop out over time. Drainage holes have been provided in the bituminous bases for the streets around Rice Park and in and appear to be working. However, those streets have new brick with tight joints and little percolation.

This system should not be used where the cobbles or bricks are not dimensionally consistent. On Main Street in Minneapolis granite cobbles were laid in a bituminous bed and then rolled. When the bituminous set up the end result was a washboard texture to the street.

Bituminous also has a limited life. Typically the design life on a bituminous street is 20 years. However given the bituminous will not be subject to as much wear and tear because of the brick driving surface it may last up to 35 or 40 years. When the time comes to replace the bituminous all the bricks will have to be removed and re-laid. This would be a messy project, particularly if a neoprene modified asphalt adhesive is utilized for a setting bed rather than sand.

METHOD 3: DRYLAID OVER A CONCRETE BASE

This method is similar to method number 2 except concrete is utilized for a base rather than bituminous. This system is considered a rigid pavement system and is typically used in areas that experience a high volume of traffic and heavy loads such as Superior Street in Duluth. The Duluth system uses 9” of concrete over 12” of Class V. The bricks are then placed in a ¾” asphalt setting bed.

Pros.
Concrete is more durable than bituminous and not likely to deteriorate for 50 years. This system is also good as a base for new dimensionally consistent pavers.

Cons.

A concrete base is substantially more costly to construct and to repair than the other two systems. If a sand setting bed is utilized good drainage is essential. Water will percolate into the joints, freeze, and damage the bricks and concrete over time. With a rigid base, traffic running over the more flexible brick driving surface can cause a pumping action that eventually pulls the sand out of the setting bed and joints causing deflections in the surface.

This system is also very difficult to repair. If asphalt adhesive is used to set the bricks they will be very messy and difficult to remove. The concrete will also have to be sawcut to make any repairs to utilities below the surface.

In Duluth when bricks have to be removed to make utility repairs they cannot be salvaged because the 3/4" asphalt setting bed is stuck to the brick. Due to the limited availability of used bricks and cobbles, the ability to salvage them after repairs is important.

Recommendations from Glacial Ridge:

Glacial Ridge has built all three bases for paver systems. For new clay pavers, all three methods can be successfully used, however historic clay pavers are best laid with the flexible system, an aggregate base with sand (Method 1). Sand permits proper drainage and can adjust to keep moisture away from bricks. It is possible to engineer a concrete base with weep holes for historic paving (Method 3), however the challenges with this system are lack of tight joints, designing base around possible height variations of cobble, and additional water congregation (leading to deterioration).

Historic granite cobbles (such as at Main Street in Minneapolis), are best set in aggregate base with sand (Method 1). Typically granite cobbles have a variation in height of up to 1.5 inches and a sand setting bed is needed for settling allowance. Glacial Ridge said they would not recommend setting historic granite cobbles in bituminous (Method 2) and cautioned using a concrete base (Method 3) because one would have to design/engineer the base for possible height variations.

For resetting historic brick/clay or granite pavers (cobbles) our recommendation is to utilize method number one with a crushed stone base. This system is the most simple to construct, maintain, and cost effective overtime.

Cost

Carl Bolander and Sons quoted $6-$7 per square foot to salvage bricks and reinstall. L.P.S. Paving quoted $5.50 - $7.00 per square foot to salvage brick and reinstall. Glacial Ridge quoted $5.50 to $8.00 per square foot to salvage, palletize, store and reset. Costs do not include base materials.

Other cities.

Wichita, KS.
The Public Works Department (PW) hand removes all pavers and palletizes the bricks. Next PW staff on "light-duty" (i.e. dump truck drivers that can't sit for a long period of time, or maintenance staff that are on restricted duty) hand cleans pavers by chipping off asphalt and debris for re-use. Wichita uses these salvaged pavers for patches and crosswalks in the City.

Dubuque, IA.
Historic pavers are to be removed by hand, cleaned by hand, and stockpiled in a secure warehouse. All pavers were removed from the Millwork District; Jackson Street is the only roadbed in the District that will be reset with historic pavers. Pavers are being re-laid on a concrete bed (drawings, Appendix G).

Portland, OR
Policy states that if more than about 50-75+ pavers are going to be removed, the city requires that the bricks be stacked and stored. Removal typically involves hydraulic machines, beginning with a hydraulic pick to raise cobbles and mortar is "busted off" cobbles.

Dumbo District, Brooklyn, New York City, NY
The Dumbo District just re-laid Washington Street and Water Street with historic Belgian block. Belgian blocks were mechanically removed and dumped into trucks to be hauled, palletized, and stored. Washington St. was rebuilt concrete base (Photos, Appendix H).

C. Maintenance issues, best care practices, and associated costs related to maintenance.

"As mentioned earlier the streets can be repaired easily and cost effectively if the city trains crews to lay pavers the proper way. The beauty of utilizing a dry laid and stone base system is that repairs can be made easily. To repair dips in the paving a prost can be used to pull the pavers out of the street. A probst is a special tool from Germany made for pulling pavers. The tool costs approximately $200 and replacement blades can be purchased for $10."[2]



Images of a probst: http://www.expresstools.co.uk/shop/probst/probst-lifting/probst-

[2] Dahlgren, Shardlow, and Uban, Inc. *Grand and St. Albans Sewer Separation Project. Ramsey and Crocus HIll Street Replacement Project.* Rep. St. Paul, 1993. Print.

paver-boy-block-lifter-832518.html

Snow Plowing

"Several cities, including St. Paul and Duluth have used rubber blade attachments for snowplows to remove snow from brick streets and to minimize damage. Typically, the blades wear out and are not replaced. Apparently, the cobble and brick streets in St. Paul and Duluth have been plowed with normal snowplows for quite some time and deterioration is not that noticeable."[3]

Glacial Ridge recommends that pavers be plowed with a floating blade (which does not have to be rubber).

Dubuque, IA.
Jackson Street, the road re-laid with historic brick pavers in the Millwork District, will have the same maintenance schedule as all other surrounding streets. John Deist, City Engineer for Dubuque, said pavers are great to maintain because the city can remove small sections, fix said problem, and reset pavers.

Philadelphia, PA.
Philadelphia Streets Department keeps records of any work done to designated streets. Every few years the Streets Department hires a contractor to repair/fix damage done to designated streets (e.g. replace pavers that were removed to install a utility line).

Portland, OR
Cobble streets receive same maintenance as regular streets; cobble streets are low volume streets.

Rock Island, IL

> *Repair Policy*[4]
> *"After the Brick Streets Plan was adopted by City Council in 1988, policies to ensure the preservation of the surface of category one and category two brick streets were implemented. The City Engineer mandated that all surfaces disturbed by utility cuts for these streets be replaced in brick. This repair policy has been limited to utility cuts which excavate the surface of the street. Asphalt or concrete fill are permitted when dips or holes occur through underground, natural or wearing circumstances. The City has an obligation to eradicate unsafe situations. If existing utility patches are re-excavated on category one and category two streets, they must be replaced with brick if some portion of the newest excavation touches brick.*

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[3] Dahlgren, Shardlow, and Uban, Inc. *Grand and St. Albans Sewer Separation Project. Ramsey and Crocus HIll Street Replacement Project.* Rep. St. Paul, 1993. Print.

[4] City of Rock Island Community & Economic Development Department Planning & Redevelopment Division. *Brick Streets Plan*. Publication. City of Rock Island: City of Rock Island Community & Economic Development Department Planning & Redevelopment Division, 2005. Print.

Simultaneously, the Public Works Department began an active salvage operation of street brick just for repair purposes. In addition, adjacent road repair which may impact the edges of brick streets near intersections is reviewed by the Preservation Commission if the affected street is category one, two or three."

Long Term Maintenance Policy
The 1988 Brick Streets Plan recommended that Highland Park Historic District and 12th Street be scheduled for restoration through the Capital Improvements Plan. To date, this has not occurred, and in fact, no regular maintenance of any brick street was recommended or had been implemented. In a survey conducted in February 2000 of 25 other Illinois and Iowa communities, Planning & Redevelopment Division staff found that those handful of cities that were proactively repairing brick streets (Champaign, Davenport and Galesburg) had special set-asides in their street repair budgets.

With the 2000 version of the Brick Streets Plan, City Council approved a new maintenance budget to be specifically targeted for brick streets. Five percent of the annual budget for street maintenance will be set-aside to remove patches and potholes, level surfaces and generally do surface improvements that would improve the rideability and appearance of brick streets.

An equitable proportion of the city's street maintenance budget is reserved for brick streets. There are 8 miles of brick streets out of 170 miles of streets in the city, which is 4.7% of all streets and rounds up to 5%.

The annual brick street maintenance policy will commence at the beginning of the 2001 fiscal year. The Highland Park Historic District streets will be repaired first, and then the category two streets with the worst done first. The Public Works Department will determine the order of the category two streets.

City Council also decided to pursue TEA21 (U.S. Department of Transportation's Transportation Efficiency Act) funding for the repair and restoration of 12th Street. If outside sources of funding are not feasible, the prioritization of the 5% maintenance budget will be reconsidered.

Other outside grant sources will continue to be options for brick streets repair and reconstruction as opportunities are available."

Wichita, KS
Wichita Public Works Department maintains brick streets internally. Brick streets are treated the same as regular streets (maintenance wise). Anecdotally, Public Works has found that new pavers do not withstand traffic as well as old (historic) pavers.

Dumbo District, NYC, NY
Special maintenance plans are not created for Belgian block streets in Dumbo District.

Once the work is complete, streets are turned over to Public Works.

D. Projects involving historic street pavers and ADA compliance and accessibility.

Glacial Ridge
Al Lotthammer and Paul Lura, contractors of Glacial Ridge said a programming decision must be made in regards to the pavers and ADA compliance before a design can be created and carried out. Are the pavers part of the historic infrastructure that the city and community want to retain? Is the primary program of the district to retain all historic material or is it to give equal access to all? If retaining historical pavers is the city's focus, the city must realize "the pavers are what they are" and work those characteristics.

Suggestions given by Lotthammer and Lura include installing new ADA accessible pavers in crosswalks, making atleast one side of each street ADA accessible, and avoiding using granite slabs in any type of vehicular areas as they are "tippy and do not stay in place."

Dubuque, IA
ADA compliance and "Complete Streets" are two reasons most pavers were removed from the Historic Millwork District (only Jackson Street is being re-set). During public hearings related to design programming, many people in the biking community voiced concern/opposition to resetting historic pavers, as bikers have trouble navigating wheels through brick paved streets.

Aside from Jackson St., reclaimed brick pavers are used as accents in curb cutouts. Alleys and parking aisles were reset with new pavers (for storm water management) as the City Engineers did not feel confident that historic pavers could bear heavy axle weights such as dump and garbage trucks.

Jon Dienst, Civil Engineer for the City of Dubuque, said Iowa SHPO and the National Trust of Historic Preservation are both very approving of their new streets designs and material usages.

QuickTime™ and a
decompressor
are needed to see this picture.

The middle swath of roadway on Jackson Street will be reset with historic pavers and historic rail lines to give context to the area. Image courtesy of the City of Dubuque, IA.

Philadelphia, PA
"The jurisdiction of the Historical Commission is over the cart-way only. The District designation does not include curbs or sidewalks. Since most ADA requirements deal with dimensions and materials for sidewalks and ramps and not the cart-way itself, little has needed to be changed to meet ADA requirements." – Laura Spina, Senior Planner City Planner at City of Philadelphia

If a historic street or historic infrastructure needs to be modified, the Planning Commission tries to find the best design situation; they seek to retain historic materials while making areas/districts/buildings accessible to all. Ms. Spina emphasized decisions are made on a case-by-case basis.

Dumbo District, Brooklyn, New York City, NY
Sidewalks were rebuilt using a tinted concrete that complements the Belgian Block. Appropriate ADA accessible PED ramps were installed; crosswalks are marked by two rows of 2x3 granite slabs with smaller blocks between and on the exterior of the two granite slabs. Granite curbs were also installed.

E. Historic street pavers and the integration of stormwater management.

"From a stormwater management perspective, porous asphalt, porous concrete, and permeable pavers—all with the open-graded aggregate system—are techniques that can restore permeability and infiltration and provide large storm detention in a highly urban

environment. Parking lots, alleyways, driveways, fire lanes, and parking lanes on streets are common examples of impervious flatscape areas that can instead be porous or permeable to reduce runoff. Communities can retrofit these areas to help retain the economic benefits of developed land while reducing offsite impacts."[5] (Appendix I, full article)

Glacial Ridge.
Glacial Ridge stated that spacer units can be installed under historic pavers to assist with stormwater management, though one would not want to use spacers under historic pavers on vehicular lanes as this could open up joints.

In reference to storm water management, a water management analysis needs to be done to understand how much water needs to be handled, where is the inflow coming from (rooftop, immediate 100 ft., 800 ft.,), etc. before a solution can be designed.

Glacial Ridge suggested looking at three cities for stormwater management case studies:
1. West Union, IA – channeled water into rain gardens on Main Street;
2. Chicago, IL – Green Alleys program
3. Charles City, IA – used Federal Stimulus money on 6 to 8 blocks of pavers in residential area.

Dubuque, IA
New pervious pavers were installed in alleys and at parking spots help Dubuque with storm water management. Land under Millwork is mainly a vacated riverbed, so little work has to be done with stormwater management.

Dumbo District, NYC, NY
Catch basins were installed at every corner; streets with known water problems received extra 1-2 catch basins.

[5] "What I Learned in Paver School." by Michelle DeLaria. Stormwater; The Journal for Surface Water Quality Professionals May 2008. Northland NEMO. Northland Nonpoint Education for Municipal Officials. Web. 10 Jan. 2011. <http://northlandnemo.org/images/Stormwater%20Journal%20-%20What%20I%20Learned%20in%20Pavers%20School%20april%202008.pdf>.

Paver question:
What are example historic warehouse district/ industrial areas that are located in northern climates (i.e. snow, snow removal, freeze/thaw) that have successfully retained historic paved streets?
Here are some specific issues we are looking to address:
a) Preservation of historic materials, removal, cleaning and replacement of paving materials and associated costs.
b) Maintenance issues, best practices and associated costs.
c) How did the project deal with ADA compliance and accessibility.
d) Did the projects integrate stormwater management.
e) Did the projects integrate street trees or greening.
f) How were the projects funded?

Infrastructure question:
What are example historic warehouse district/ industrial areas that have successfully preserved/ retained loading docks and related infrastructure?
Here are some specific Issues we are looking to address:
a) What are some of the design challenges faced in the retention of the loading docks....please provide specifics.
b) How were loading docks replaced or modified....please provide specifics.
c) How did the project deal with ADA compliance and accessibility?
d) How were the projects funded?

ADA and Pedestrian Accessibility Relating to the Preservation of Historic Infrastructure

City	Design Challenges	Modification/ Replacement	ADA Compliance/ Accessibility	Other
Dubuque, IA	Historic brick paved streets, buildings entrances without ADA access, loading docks without proper ramping, lack of sidewalks	Historic brick pavers mostly removed from district; Caradco Building: main entrance re-situated to east side with exterior elevator located along side newly built loading dock	Building concrete crosswalks and sidewalks; Caradco building; routing all primary building access through East ADA accessible entrance	Since most rehabilitation projects are seeking tax credits, IA SHPO weighs in on rehabilitation design. City basically allows SHPO to approve design modifications
Dumbo Dist., Brooklyn, New York City, NY	Uneven roads filled with asphalt patches, inappropriate curb and gutters, lack of defined crosswalks, lack of defined bike lanes, lack of PED ramps	Rebuilt streets with historic pavers, built uniform sidewalks on both sides of street using tinted concrete and granite curbs, created defined bike lanes	ADA accessible PED ramps installed; Constructed ADA compliant crosswalks (two rows of 2x3 grantite slabs with smaller blocks between and on the exterior of the two granite slabs)	On Washington St., special pavers were laid just in the bicycle lane, with the intention of giving bicyclists a smoother ride. Other streets, Belgian blocks were turned at a 90-degree angle in the bike lanes to identify space.
R-Street, Sacremento, CA	R Street was never fully improved to include comprehensive sidewalks, gutters and drainage	Raised walkways, new roadway surfaces, designated on-street parking, pedestrian-style street lighting, incorporation of historic elements (e.g., rail lines), new drainage systems, ADA-compliant accessibility	Constructed ADA accessible sidewalks and crosswalks,	R Street is still an active warehousing district, ADA accessible sidewalks were built around historic loading docks;

CASE STUDIES OF HISTORIC STREET MATERIALS

Rock Island, IL	Created a "Brick Streets Plan;" city policies for maintining the best of Rock Island's brick streets	Four street categories were created, ranging from restoration recommendations to identifying those appropriate for resurfacing. Category one and two streets have policies preserving the street surface in instances of excavation	Brick Streets Plan creates a procedure for brick streets reconstruction utilizing a special service area.	5% of yearly streets budget is set aside for brick streets maintenance.
Old Town, Wichita, KS	Thoroughfares with historic street materials are ranked or prioritized to save said materials; also there is a moratorium to save streets with extant historic street materials	Public Works maintains brick streets the same as asphalt or concrete streets, however in kind patching is required.	Partial assessment reconstruction in certain areas	Wichita's Public Works Staff on "light Duty" hand cleans and palletizes historic pavers for storage and eventual restoration work.

Best Practices in Relation to Historic Street Materials

Best practices involving the preservation and reparation of historic street materials including clay, wood, and granite pavers.

1. Identification of brick, granite or wood streets as contributing resources to historic infrastructure in Minneapolis. Many cities including New York City, Philadelphia, Rock Island, IL, and Portland have identified said materials as contributing, leading to maintenance and reparation plans and ultimate preservation.

2. Creation of a 'Historic Street Materials Plan' like that of Rock Island, IL. First streets containing historic street materials are identified, evaluated, and categorized in terms of preservation. Once streets with historic streets materials are categorized, a prioritization list for public and private entities is created and distrubued. Along with categorization, policies to ensure the preservation of the surface of category one and category two brick streets must be implemented.

3. With the completion of a Historic Street Materials Plan, City Council should approve a new maintenance budget to be specifically targeted for streets composed of clay, wood, or granite pavers. A certain percentage of the annual budget for street maintenance should be set-aside to remove patches and potholes, level surfaces and generally do surface improvements that would improve the rideability and appearance of brick streets.

Techniques and associated costs to properly remove, clean, and reset historic paving materials.

Remove.
The clay, wood, and granite pavers on all identified streets may be salvaged with varying degrees of success and loss due to age, wear, composition, and removal process. Every contractor contacted utilized mechanical equipment in the paver removal process.

Glacial Ridge (one of the best Paver companies in Minnesota) begins the process by handpulling a few pavers to examine the quality and strength of the pavers. If the bricks appear to have not too much moisture and/or deterioration, then Glacial Ridge will use a bobcat to lift and dump bricks. Next, workers clean the bricks before they are palletized. If the bricks appear fragile at the initial removal, GR will handpull the bricks. Al Lotthammer warns against reusing fragile bricks explaining that if the bricks are too fragile to remove with a machine, they likely will not hold up to the re-installation process of being mechanically repacked.

Glacial Ridge estimated that 60-80% of bricks are salvageable depending on the setting method used, the fragility of bricks, and the texture of said bricks.

Clean.

All for-profit contractors contacted by Ms. Lindberg said cleaning method was basically "clapping" the bricks together to clean off dirt and related debris. Glacial Ridge stated that cleaning the bricks becomes a cost function. If bricks need to be hand scraped, workers will use a putty knife to clean the joints. Texture on the side of the bricks adds a variable. Hand scraping becomes very expensive as the "scrapers" are paid common labor rate.

Reset
There are three basic systems that could be used for reconstructing the brick and cobbles streets, .drylaid over crushed stone base, drylaid over a bituminous base, and drylaid over a concrete base. The construction methods vary mostly in the type of base materials that are used. All of the systems will work, however, drylaid over crushed stone is best for historic pavers.

Maintenance issues, best care practices, and associated costs related to maintenance.

Repairs
"As mentioned earlier the streets can be repaired easily and cost effectively if the city trains crews to lay pavers the proper way. The beauty of utilizing a dry laid and stone base system is that repairs can be made easily. To repair dips in the paving a prost can be used to pull the pavers out of the street. A probst is a special tool from Germany made for pulling pavers. The tool costs approximately $200 and replacement blades can be purchased for $10."[1]

Snowplowing
"Several cities, including St. Paul and Duluth have used rubber blade attachments for snowplows to remove snow from brick streets and to minimize damage. Typically, the blades wear out and are not replaced. Apparently, the cobble and brick streets in St. Paul and Duluth have been plowed with normal snowplows for quite some time and deterioration is not that noticeable."[2] Glacial Ridge recommends that pavers be plowed with a floating blade (which does not have to be rubber).

Historic street pavers and the integration of stormwater management.

"From a stormwater management perspective, porous asphalt, porous concrete, and permeable pavers—all with the open-graded aggregate system—are techniques that can restore permeability and infiltration and provide large storm detention in a highly urban environment. Parking lots, alleyways, driveways, fire lanes, and parking lanes on streets are common examples of impervious flatscape areas that can instead be porous or permeable to reduce runoff. Communities can retrofit

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[1] Dahlgren, Shardlow, and Uban, Inc. *Grand and St. Albans Sewer Separation Project. Ramsey and Crocus HIll Street Replacement Project.* Rep. St. Paul, 1993. Print.
[2] Dahlgren, Shardlow, and Uban, Inc. *Grand and St. Albans Sewer Separation Project. Ramsey and Crocus HIll Street Replacement Project.* Rep. St. Paul, 1993. Print.

these areas to help retain the economic benefits of developed land while reducing offsite impacts."[3]

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[3] "What I Learned in Paver School." by Michelle DeLaria. Stormwater; The Journal for Surface Water Quality Professionals May 2008. Northland NEMO. Northland Nonpoint Education for Municipal Officials. Web. 10 Jan. 2011. <http://northlandnemo.org/images/Stormwater%20Journal%20-%20What%20I%20Learned%20in%20Pavers%20School%20april%202008.pdf>.

Wichita's Old Town

- Streets – ADA/Bike
- Streets - funding
- Streets - maintenance

Background
"Wichita's Old Town is home to a collection of large brick structures, built primarily between 1870 and 1930, located adjacent to downtown. The area is approximately 25 acres, shaped roughly like a square and made up of long skinny blocks, bounded by arterials on three sides and rail on the fourth. Originally, buildings were used for the storage and transfer of goods from wholesalers to retailers."[1]

In 2004, the original 4-block area of Old Town received National Register of Historic Places designation. Old Town is still a limited industrial area with many commercial and entertainment uses (bars and restaurants) developed on the first floor with housing above.

Redevelopment History
"In 1991, Wichita adopted the Old Town Overlay District that allows for residential uses within the underlying Limited Industrial zoning. It also established design criteria that allow modern high-density, mixed-use development within the historic character of Old Town.

That same year, routine tests found groundwater contamination in a six-square-mile area that included Old Town. Rather than seek assistance through the federal Superfund program, Wichita took financial responsibility for the cleanup by creating an environmental Tax Increment Financing (TIF) district.

After the cleanup, several new restaurants and businesses opened in Old Town. A separate TIF district for Old Town improvements was created, and the city and Sedgwick County contributed $4 million to start street improvements, pedestrian-level lighting, sidewalks, parking facilities, and rehabilitation of the building that would house the new farmer's market.

Improvements included brick paving to preserve the historic character of the neighborhood and a parking district to promote shared parking. The city also eliminated curbs, provided wide sidewalks, and preserved the boardwalks to ensure that citizens using bicycles, wheelchairs, and strollers could easily move around Old Town. Two large public plazas were designed to host specialty events, festivals, and concerts and to serve as informal gathering places to relax and play."[2]

"Property owners paid for 50% of the streetscape

[1] Barrett, Evan, Anna Lackender, Sushil Nepal, and Kyle Smith. Dubuque Warehouse District Recommendations for Revitalization. Rep. Dubuque: City of Dubuque Department of Economic Development, 2007. Print.

[2] "Old Town Wichita — Wichita, Kansas." *Great Places in America: Neighborhoods*. American Planning Association. Web. 24 Jan. 2011. <http://www.planning.org/greatplaces/neighborhoods/2008/oldtownwichita.htm>.

improvements. However, because the City of Wichita owned so much land, in total they paid for approximately 70% of the streetscape improvements."[3]

Parking
The first master plan created in 1983, identified parking within Old Town as a significant redevelopment barrier. Wichita created a zoning overlay, establishing separate off street parking requirements for the Old Town district and adopting the shared parking concept, where each business owner pays parking fees based upon the already established parking requirements for their specific use. All parking lots and ramps are owned and controlled by the City of Wichita. To date, collected parking fees have covered about half the cost of the initial parking facilities construction.

Historic Brick Streets
The overlay-zoning district that changed parking regulations in Old Town also identified brick streets as a character-defining feature of the district. Prior to the creation of said overlay district, Wichita city ordinances, zoning codes, and/or regulations did not call out brick streets as a character defining feature, nor did they require historic brick streets be retained.

To merit brick preservation, the City of Wichita's Historic Preservation Office has ranked and prioritized all thoroughfares with historic street materials. The City has also instituted a policy that requires bricks (or historic street materials) be replaced in utility cuts on historic streets however there is not a mandated existing patch replacement program.

Currently, Wichita does not have a specific brick maintenance budget. If brick streets are reconstructed, in certain locations there are partial assessments relayed to owners.

Brick streets that are not retained are subject to Wichita's salvage policy, which requires historic pavers be removed, cleaned, and stockpiled for future reuse. Public works staff on light duty hand clean and palletize pavers. The City then reuses salvaged pavers for other restoration projects in City limits.

Loading Docks
Similar to the Warehouse District, Old Town businesses typically use loading docks for either delivery or outdoor seating.

Wichita's Design Guidelines for Existing Properties states "Features such as loading docks and metal canopies, which relate to the commercial history of the district merit preservation as well." However, the City will allow modification if it follows the Secretary of the Interior Standards for the Treatment of Historic Properties.

Kathy Morgan, Sr. Planner for Wichita's Historic Preservation Office recommends "if modification is necessary to make loading docks ADA accessible, mandate all accessibility ramps be placed on one side of dock throughout the district, (e.g. all loading docks will be accessible from the north or west ends of

[3] Barrett, Evan, Anna Lackender, Sushil Nepal, and Kyle Smith. Dubuque Warehouse District Recommendations for Revitalization. Rep. Dubuque: City of Dubuque Department of Economic Development, 2007. Print.

dock) and set guidelines, so there is conformity in the district.

Explanation of TIF
"Tax Increment Financing (TIF) funds specific public improvements by allocating future increases in property tax revenue from a specific parcel or collection of parcels that directly benefit from the improvements. The mechanism was originally conceived as a way to improve areas with excessive vacancies, deteriorating infrastructure, declining tax base, and other indicators of blight."[4] In 2004, the City of Minneapolis invested about $80 of TIF funds to redevelop the riverfront district.

Lessons for Minneapolis' Warehouse District

- Parking in the Warehouse District and near the Twins Stadium can be a challenge. Wichita's creative solution to parking helped "remove a common urban redevelopment barrier, a lack of public parking." Minneapolis should look to implement similar new and innovative ideas.

- Wichita created an overlay district that addressed and/or solved many problems unique to the Old Town district. Minneapolis should assess Warehouse District needs; if an overlay district could alleviate some design and/or preservation dilemmas, than one should possibly be considered.

- "The City of Wichita made multiple streetscape investments in Old Town funded to induce area redevelopment. These public improvement projects demonstrated Wichita's commitment to Old Town and encouraged private developers to invest their own capital."[5] The City of Minneapolis "should work with property owners and developers to determine appropriate timelines for streetscape improvements."[6] The City may want to consider creating a TIF district in the Warehouse District, to improve streets and streetscapes.


Wichita's Old Town district at dusk (Source: Keith Wondra via Flickr).

[4] Barrett, Evan, Anna Lackender, Sushil Nepal, and Kyle Smith. Dubuque Warehouse District Recommendations for Revitalization. Rep. Dubuque: City of Dubuque Department of Economic Development, 2007. Print.

[5] Ibid.
[6] Ibid.

Dubuque's Historic Millwork District

Background

Located in northeast Iowa, "Dubuque is the region's main commercial, industrial, educational, and cultural center. The City has historically relied on manufacturing and other heavy industrial enterprises, but over the last few decades it has witnessed fundamental economic and demographic shifts."[1]

In 2004, Dubuque adopted the Downtown Master Plan, which identified the rehabilitation of Dubuque's Historic Millwork District as a "keystone to the region's aggressive economic development strategy."[2] Soon after, Dubuque's City Council identified 'Sustainability" as a priority and adopted a Warehouse District Revitalization Policy. In 2008, a District Master Plan was created, giving guidance and vision to the new project. In 2009, Dubuque was chosen as the National Trust for Historic Preservation's "Preservation Green Lab" pilot city.

Currently, one million square feet of nearly vacant warehouse space is in development or scheduled for redevelopment as part of the Historic Millwork Revitalization Plan. Phase 1 of Streetscape and DOT TIGER construction is nearing completion.

[1] Barrett, Evan, Anna Lackender, Sushil Nepal, and Kyle Smith. Dubuque Warehouse District Recommendations for Revitalization. Rep. Dubuque. Print.

[2]

Historic District Conditions

Most buildings are relatively intact and still retain their large metal awnings protecting the truck and train car loading docks. Many Millwork District streets were paved with red brick and a functioning rail spur line ran through the heart of the Warehouse District on Jackson Street. The majority of historic street materials were permanently removed to implement Dubuque's "Complete Streets" program.

Goals

Dubuque wishes to achieve the following goals with the revitalization of the Millwork District:

- Preserve the millwork history of Dubuque
- Create an urban, mixed-use neighborhood
- Become a model for redevelopment by incorporating sustainable practices
- Attract and retain a quality workforce for Dubuque's growing economy

Redevelopment History

- 2004 - Adopted into Downtown Master Plan
- 2006 - Envision 2010 "Top 10" project; District Revitalization recognized in Dubuque's Iowa Great Place designation; City Council sets Sustainability as a top priority
- 2007 - City Council adopts District Revitalization Strategy; City Council sets District as top priority
- 2008 - Public/private partnership funds District Master

Plan and Market Analysis

- 2009 - National Trust for Historic Preservation "Preservation Green Lab" pilot city; Public/private partnership funds District Resource Development Director; District-wide energy analysis completed; Iowa Great Places funds public art & streetscape
- 2010 - Phase I streetscape construction; 75 residential units, 35,000 SF commercial space completed; Caradco Community Improvement Hub buildout completed; DOT TIGER funded streetscape construction begins including new utilities and complete streets design; Iowa Great Places grant for artistic streetscape elements completed
- 2011 PROJECTED COMPLETION - 125 residential units, 45,000 SF commercial space completed; Streetscape construction project completed
- 2012 PROJECTED COMPLETION - 50 residential units, 30,000 SF commercial space completed

Projected Improvement Budget

Millwork District Master Plan…..... $150,000
District Energy Study $65,000
Public Infrastructure (Streets, utilities, pedestrian signage) $5,600,000
Public Parking Construction $2,200,000
900 Jackson St/Caradco Main Plant..... $27,000,000
1000 Jackson St/Caradco Building 24..... $25,000,000
1079 Elm St/Novelty Iron Works..... $38,850,000
TOTAL PROJECTED BUDGET..... $98,865,000

Funds Secured To Date

Pledged Private Developer Investments..... $28,050,000
City of Dubuque..... $4,400,000

Local investments Will Leverage State & Federal Funding
State Historic Tax Credits $20,500,000
Federal Historic Tax Credits $17,300,000

Grants Secured to Date
US DOT TIGER (ARRA funds)..... $5,600,000
Iowa Great Places $150,000
EDA Master Plan Funding $82,727
Main Street Iowa Challenge Grants..... $120,000
TOTAL FUNDS SECURED TO DATE-$76,202,727

Of Note- Historic Street Materials

Dubuque has excavated and stockpiled all historic pavers in the Millwork District. Only at Jackson St. (the main thoroughfare) and at the periphery of bumpouts, will historic pavers be re-laid.

"Complete Streets" and ADA Compliance are two reasons why additional streets in the Millwork District are not being reset with historic pavers. In relation to "Complete Streets" many people in the biking community voiced concern/opposition at public hearings to reset pavers, as bikers have trouble navigating wheels through brick paved streets. Wheel chairs also experience difficulty in navigation.

Jon Dienst, P.E., Civil Engineer for the City of Dubuque said Iowa SHPO and the National Trust of Historic Preservation have approved of the City's removal of historic street materials, new streets designs, and new material usages.

Lessons for Minneapolis' Warehouse District

- 38% of Dubuque's Historic Millwork Revitalization is being funded through ($37.8 million) State and Federal Historic Tax Credits; 28% of revitalization is being funded by Private Developers ($28.05 million), with the City currently contributing 4% or $4.4 million. Minneapolis needs to harness creative funding mechanisms to move their project forward.

- Early in the process, "Sustainability" and "Complete Streets" were identified as two main project goals. The City was given flexibility in design and historic infrastructure retention because of their foci.

- Greening, street tress, and storm water management via pervious pavers are three prevalent additions to the Dubuque Warehouse District; Minneapolis may want to consider natural ecology as a storm water management tool.

- Many interesting design options were used to make Dubuque's streets and buildings ADA compliant. such as exterior elevators on loading docks, building orientation access, ADA compliant pavers, PED strips, etc.

THE CITY OF DUBUQUE
Masterpiece on the Mississippi

New York City, NY – Dumbo District (Brooklyn)

Background

"The DUMBO Historic District, located along the East River waterfront in Brooklyn, is one of New York City's most significant extant industrial waterfront neighborhoods. During much of the nineteenth and twentieth centuries, the area was home to some of the largest and most important manufacturing businesses in Brooklyn or New York City…the approximately 91 buildings in the historic district reflect important trends in the development of industrial architecture in the United States during the nineteenth and twentieth centuries, and embody an important era of Brooklyn and New York City history…the District is enhanced by its distinctive industrial streetscapes. Many of the streets and sidewalks retain their original granite Belgian block paving as well as the network of train tracks, running along the streets and in some cases extending into individual buildings, laid out by the Jay Street Connecting Railroad. The Manhattan Bridge, which soars over the area, provides a dramatic backdrop for the neighborhood's industrial architecture. The anchorage and piers of the bridge, with their boldly-detailed arches spanning streets and sidewalks, are a major presence and strongly contribute to the district's sense of place."[1]

[1] Dolkart, Andrew S. Dumbo Historic District Designation Report. Rep. New York City: New York City Landmarks Preservation Commission, 2007. Print.

Redevelopment History

In the late 1970s and early 1980s, "developers began to convert old warehouses into residential lofts and commercial spaces. As DUMBO began attracting more residents, small businesses began opening in the neighborhood. In addition, artists and artisans continued to flock to the area because they viewed DUMBO as an ideal working environment; its large warehouses could provide them with remarkable studios and its scenic backdrops spur their creativity.

In 1981, David Walentas of Two Trees Management purchased the former Gair buildings, a 12-block area of 2 million square feet from Harry Helmsley. The City was at first reluctant to rezone DUMBO for residential usage because officials wanted to preserve manufacturing jobs in Brooklyn, but in 1998 when the last major manufacturer left the Gair buildings, the residential rezoning was enacted. That year, 1 Main Street became the first residential development in DUMBO. Over the course of the last decade, hundreds of units have been completed, and the neighborhood's residential population soared."[2]

"In 2006, the Dumbo Improvement District was launched by the public and private sector to help oversee the growth of the

[2] "The Reinvestment of the Private Sector." Dumbo Improvement District. Dumbo Improvement District. Web. 16 Jan. 2011.

neighborhood. Today, DUMBO is home to many more than just artists; families, young professionals, offices, small businesses, restaurants and galleries are all part of the rich mosaic."[3]

Retention of Historic Street Materials

Belgian block restoration remains a top priority for The Dumbo Improvement District (a 501(c)(3) non-profit organization that manages DUMBO's Business Improvement District and is dedicated to enhancing and promoting DUMBO). Dumbo Improvement District's current construction project is to repair the neighborhood's network of Belgian block streets along Water Street from Adams Street to Old Fulton Street and along Washington Street from York Street to Plymouth Street. This is a $20 million dollar, multi-phased project that commenced in the summer of 2009 and is scheduled to be completed in the summer of 2011.

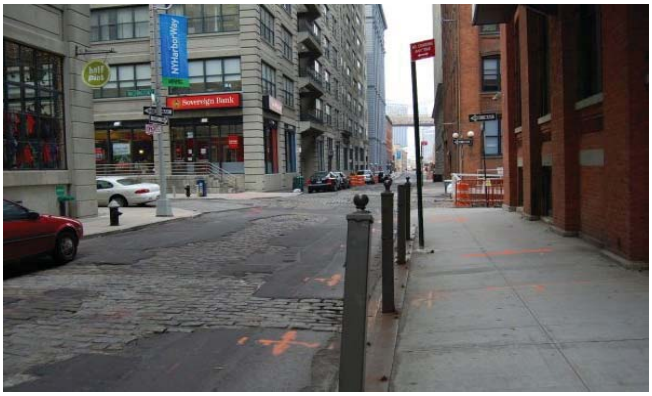
As of January 2011, the majority of the historic Belgian Block was mechanically removed, roadways rebuilt, concrete ADA accessible sidewalks constructed (using a tinted concrete that complements the Belgian Block), ADA accessible PED ramps erected (leading to new granite slab crosswalks), granite curbs installed and new catch basins placed at every corner (streets with known water problems received extra 1-2 catch basins).

On Washington St., special pavers were laid just in the bicycle lane, with the intention of giving bicyclists a smoother ride.

Other streets, Belgian blocks were turned at a 90-degree angle in the bike lanes to identify space.

This project was paid for by:
New York City Department of Design and Construction (DDC)
New York Department of Environmental Protection (DEP)
New York City Economic Development Corporation

The Dumbo Improvement District is now working with the City of New York to source the additional funding for the next four phases of Belgian Block Street Restoration in DUMBO District.



BEFORE reconstruction. October 2009, Water Street looking towards Washington St.

[3] "DUMBO Today." Dumbo Improvement District. Dumbo Improvement District. Web. 16 Jan. 2011.

BEFORE reconstruction. January 2010, Water Street from Main, looking at Washington St.

AFTER reconstruction. October 2010.

Lessons for Minneapolis Warehouse District

- "The Dumbo Improvement District has made great strides in improving the neighborhood streetscape, which in turn has vastly enhanced the quality of district life. Minneapolis should consider how similar changes could positively affect the Warehouse District.
- The pre-2009 condition of the Belgian block streets and roadways in Dumbo District appear similar to the extant historic streets in Minneapolis. It may behoove Minneapolis to look closer at historic street restoration and the benefits drawn from this process

Rock Island, Illionois' Historic Brick Streets Plan

Background
Rock Island is located in the southwest corner of the Quad Cities area in western Illinois on the Mississippi River, 165 miles west of Chicago.

In 1988, Rock Island, IL created a 'Brick Streets Plan' for the purpose of preserving the best of Rock Island's 8 miles of remaining brick streets. "Brick streets are an asset to the community and provide a very real sense of "time and place" in a residential neighborhood. The Plan includes a preservation prioritization list of all brick streets, maps, methodology by which the plan was created, and background and information about the streets."[1]

Development History
"First, existing brick streets in 1988 were identified. Then, these streets were analyzed in terms of condition of the paving and architectural and structural condition of the buildings abutting them. With assistance from the Public Works Department, utilities and street standards were also identified. After factoring in these street and building condition variables, the Preservation Commission recommended the streets be split into five categories…today, there are four brick street categories, with separate preservation recommendations for each. These recommendations range from restoration to no preservation.

In late 1999, City Council requested the Preservation Commission look again at the Brick Streets Plan, specifically the repair and reconstruction provisions. The 1988 plan was largely silent on these provisions, with the exception of utility cuts, so Planning & Redevelopment Division staff canvassed 25 other communities for their practices on brick streets preservation, repair and reconstruction...while the prioritizations and basic preservation recommendations changed very little in 2000, a major maintenance program was implemented and policy changes were recommended for brick streets reconstruction."[2]

Financing
"An equitable proportion of the city's street maintenance budget is reserved for brick streets. There are 8 miles of brick streets out of 170 miles of streets in the city, which is 4.7% of all streets and rounds up to 5%."

"With the 2000 version of the Brick Streets Plan, City Council

[1] City of Rock Island Community & Economic Development Department Planning & Redevelopment Division. Brick Streets Plan. Rep. Rock Island: Rock Island Preservation Commission, 2005. Print.

[2] City of Rock Island Community & Economic Development Department Planning & Redevelopment Division. Brick Streets Plan. Rep. Rock Island: Rock Island Preservation Commission, 2005. Print.

approved a new maintenance budget to be specifically targeted for brick streets. Five percent of the annual budget for street maintenance will be set-aside to remove patches and potholes, level surfaces and generally do surface improvements that would improve the rideability and appearance of brick streets."

Lessons for Minneapolis' Warehouse District

- Minneapolis was once paved entirely in wood, brick, and/or granite pavers; today less than 35 segments of these historic street materials are visible throughout the City. The vast majority of the city's original brick, wood, or granite-paved streets have been paved over with asphalt.

  Roads with historic street materials should be evaluated and a Historic Street Materials plan should be created for the purpose of preserving the remaining clay, wood, and granite paver streets in Minneapolis.

- In a survey conducted in February 2000 of 25 other Illinois and Iowa communities, Rock Island's Planning & Redevelopment Division staff found that those handful of cities that were proactively repairing brick streets (Champaign, Davenport and Galesburg) had special set-asides in their street repair budgets.

- Utility work presents a challenge to preserving roadbeds with historic street materials, however there are no brick streets in Minneapolis that are free of utilities. Rock Island addressed the problem as follows: "The City Engineer mandated that all surfaces disturbed by utility cuts for these streets be replaced in brick. This repair policy has been limited to utility cuts, which excavate the surface of the street. Asphalt or concrete fill are permitted when dips or holes occur through underground, natural or wearing circumstances. The City has an obligation to eradicate unsafe situations. If existing utility patches are re-excavated on category one and category two streets, they must be replaced with brick if some portion of the newest excavation touches brick.

Philadelphia's Historic Street Paving Thematic District

- **Streets – maintenance**
- **Streets - funding**

Background

Locally designated to the Philadelphia Register of Historic places in 1998, the Historic Street Paving thematic district recognizes rare paving throughout the city. Designation includes all streets containing at least 30% of original, exposed, historic street paving materials (cobbles, granite pavers, bricks, or blue stone). The designation encompasses about 56 streets and includes the cartway only (curbs or sidewalks are not included). Originally a non-profit inventoried the streets, surveying 328 blocks.

"The examples of street paving included in this multiple resource nomination possess significance as rare surviving fragments of the history of street paving in the City of Philadelphia, and as landmarks forming a visual record of the way Philadelphia looked in the past."[1]

Care of the District

Any work that is physically done to the designated streets needs approval of the Philadelphia Historical Commission. Historical Commission staff has the ability to approve basic work such as street maintenance or utility work; larger projects must be heard before and approved by the Historical Commission.

Meanwhile, Philadelphia Streets Department keeps records of all work performed on designated streets. Every few years the Streets Department hires a contractor to repair/fix damage incurred on designated streets (e.g. replace pavers that were removed to install a utility line).

Financing

Each year, money is set aside from capital budget for historic street repair and maintenance. In the current capital program, "Historic Streets" is funded at $400,000 every two years, or $1.2 million over six years.

The City programs $98.7 million over six years for "Grading and Paving" of city streets. So, the fund for historic streets is barely more than 1 percent of the total budget.

[1] Historic Street Paving Thematic District - Philadelphia Register of Historic Places Nomination Form. Rep. Philadelphia: City of Philadelphia Historical Commission, 1998. Print.

Lessons for Minneapolis

- The City of Philadelphia sets aside money to repair and retain their historical streets. Minneapolis should consider designating a portion of their yearly street maintenance budget for historic street repair if they wish to retain a visual paving record in the City.

- Philadelphia's Streets Department keeps manual logs of all work done to designated streets; Minneapolis Streets Department should consider keeping a log of work occurring on all streets, especially historic, for future reference, repair, and historical documentation.

Sacremento's R Street Cooridor

Background
"The R Street Corridor is Sacramento's historic industrial warehouse district. It is a 27-block long, two block wide special planning district within Sacramento's Central City Community…R Street was once a thriving warehouse district;"[1]

"Despite the fact that R Street supported major businesses, unlike the balance of the Central City (of Sacramento), the street was never fully improved to include comprehensive sidewalks, gutters and drainage. As a result to this day it remains a relatively unimproved "working street" for truck and rail functions with patches of asphalt as necessary to reduce major pot holes, little or no sidewalks and limited drainage facilities."[2] R Street also contains "a number of under-utilized buildings and older warehouses.

In the late 1980's and early 1990's City planners and residents of the Central City promoted a multi-year planning process to address the future of the R Street Corridor. This planning effort culminated in the adoption of the R Street Master Plan in 1996 by the City Council of the City of Sacramento... revitalization progress on R Street was slow. Thus, in 2002, the State legislature granted CADA powers equivalent to a redevelopment agency for a portion of R Street generally between 9th to 19th Streets."[3]

CADA prepared an R Street Area Implementation Plan. Goals and objectives are as follows:
1. Create a mixed use, mixed income neighborhood
2. Orient development to transit stations
3. Preserve historic structures and character
4. Enhance neighborhood livability through sufficient open space
5. Develop R Street Streetscape at a pedestrian scale
6. Provide public infrastructure necessary for development
7. Create R Street as a neighborhood destination
8. Encourage participation of property and business owners in the revitalization efforts

R Street Redevelopment – Phase I
The R Street Improvements Project is a key element in historic R Street's transformation to a new transit-oriented, mixed-use neighborhood. The R Street Phase I Improvements project is currently reconstructing three blocks of R Street Corridor right-of-way to provide adequate pedestrian walkways, vehicular lanes, parking, lighting, and roadway drainage. The pedestrian

[1] "Home." Historic R Street Corridor. Web. 12 Jan. 2011. <http://www.rstreet.info/>.
[2] The City of Sacramento. Initial Study and Mitigated Negative Declaration for the R Street Corridor Urban Design Guidelines and Special Planning District Amendments. Rep. Sacremento: City of Sacramento, Development Services Department, Planning Division and the Capitol Area Development Authority (CADA), 2006. Print.
[3]

and accessibility improvements will aid the City of Sacramento's and CADA's R Street Corridor redevelopment efforts according to the R Street Corridor Master Plan and Urban Design Guidelines. Phase I will complete the first of four street reconstruction projects planned within the CADA R Street Corridor area. The improvements will support pedestrian access from the 13th Street Light Rail Station to the Capitol Lofts project, which includes 122 condominium units and 4,000 square feet of retail.

This full-scale street reconstruction project will help make a core area of the R Street corridor more vibrant, attractive and pedestrian friendly. Planned improvements include:

- Raised walkways
- New roadway surfaces
- Designated on-street parking
- Safe corners and crosswalks
- Pedestrian-style street lighting
- Preservation of historic elements (e.g., rail lines)
- New drainage systems
- ADA-compliant accessibility

Organization
The R Street Corridor has a number of organizations that work closely together to promote its economic development. These organizations include:

- Capital Area Development Authority (CADA) is a joint powers authority between the State of California and the City of Sacramento created to implement the plans and objectives of the State Capitol Area Plan, as directed by the State of California and the City of Sacramento. The Capitol Area Plan is a mixed-use plan for the management, development and disposition of state-owned property located directly south and east of the State Capitol and Capitol Park in the City of Sacremento.

- The Sacramento Area Council of Governments (SACOG) is an association of local governments in the six-county Sacramento Region. SACOG provides transportation planning and funding for the region, and serves as a forum for the study and resolution of regional issues. In addition to preparing the region's long-range transportation plan, SACOG approves the distribution of affordable housing in the region and assists in planning for transit, bicycle networks, clean air and airport land uses.

- Sacramento Housing and Redevelopment Agency, SHRA is a Joint Powers Authority that focuses on affordable housing, public housing and redevelopment projects. SHRA and CADA are partners on the Capitol Lofts housing project at 11th and R Streets.

Redevelopment Event Timeline

- 1996 - R St. Corridor Plan (Part of Sacramento Central City Community Plan): 8 years of community outreach and planning
- 1997: Sacremento Capitol Area Plan Update
- 1997: R Street Special Planning District (Zoning) (2007 Amendments)
- 1999: Central City Neighborhood Design Guidelines
- 2003: CADA Board Workshop (Focus on R Street)
- 2003: R Street Infrastructure Needs Assessment
- 2006 CADA R St. Urban Design and Development Plan
- 2008 CADA R Street Area Implementation Plan
- 2010 - 2011 Construction of R Street Improvement Project (10th to 13th Streets) begins - $8.59 million

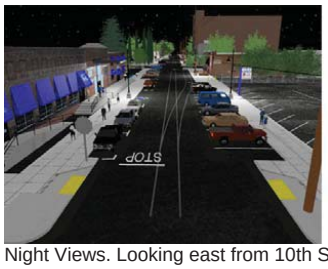
Lessons for Minneapolis's Warehouse District.

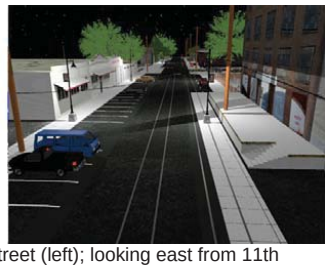
- The R Street Improvements Project is a key element in historic R Street's transformation to a new transit-oriented, mixed-use neighborhood…the 10th to 13th Street improvements are just some of the first steps the City and its community planning partners are taking to promote the corridor as a destination and enhance its diverse development opportunities.

10th Street to 11th Street. Looking east from 10th Street, existing conditions (left) and with proposed improvements (right).


11th Street to 12th Street. Looking east from 11th Street, existing conditions (left) and with proposed improvements (right).

12th Street to 13th Street. Looking east from 12th Street, existing conditions (left) and with proposed improvements (right).




Night Views. Looking east from 10th Street (left); looking east from 11th Street (right).

- Redevelopment of R Street is a multi-year, multi-phased project. Time expectations for any redevelopment project needs to be realistic, phased, and include a multi-year lag for financing needs.

- The property owners adjacent to the project have given tremendous support to the project. Each property owner sees the benefits of providing a needed pedestrian link and streets improvements to R Street.

- Because R Street is still an active warehousing district, special designs considerations are necessary. “A five-foot pathway along one side of R Street (but at the same level and with the same texture as the rest of the roadway) would be created which will be universally accessible. On-street industrial activities are maintained, such as the loading and unloading of freight trucks. The loading docks of former industrial buildings are delineated with industrial-style wire railings and converted into overflow space for retail and restaurants. Streetscape elements such as a steel trellis/shade structure, "I"-beam bollards, and utilitarian street lighting continue the industrial design language of the corridor. Since no traditional curb and sidewalk is proposed, drainage is proposed to be accomplished by valley gutters located in the roadway which will collect and direct run-off to existing drop inlets at intersections.”

- To make the district ADA accessible, the following was mandated “a minimum 5' wide ADA-accessible pedestrian path will be provided on at least one side of the street throughout the entire corridor. The pathway may jog mid-block from one side of the street to the other side. The mid-block crossing will be ADA compliant.”

There is little mention of loading docks in any of these. Are there loading docks in these districts, and if so, how are they treated?

Dubuque – The Millwork District has loading docks. The Caradco building is the first large warehouse to be rehabilitated in the Warehouse District. Because the Caradco building is a state and federal tax credit project, the City is deferring most historic design decisions to IA SHPO and the NPS. Attached is the Caradco file containing building plans; Site Plan A100 calls out loading dock; A427 details the elevator that will be installed next to the stairs and adjacent to the loading dock.

Dumbo District – Docks have been heavily modified; typically one side of dock has stairs and the opposite end is ramped. One dock appears to stretch the length of the city block; here a mid-point stair is available for consumer access. See document labeled Dumbo District Loading Docks for appropriate pictures.

Philadelphia does NOT have loading docks as the City's main development occurred before 1840.

Portland, not technically one of our case studies, has dealt with loading docks in many ways; some docks are ramped on one end, a few docks are inaccessible, it appears there are sidewalks or defined walkways built around most of the loading docks. See file folder of pictures for examples.

Rock Island does NOT have loading docks as their historic paver streets are all in the residential area.

Sacramento is still considered light industrial and does have active loading docks. The City is retaining loading docks in the R Street Cooridor and is building sidewalks around the loading docks. See design images (project is currently under construction).

Wichita's Old Town is still considered light industrial and does have active loading docks. Docks are typically used for loading, general access, or for secondary spaces by bars and cafes. Wichita DOES allow modification if it meets the Secretary of the Interior Standards. See attached images.

There is little description of the presence or absence of sidewalks in these areas. Were there existing sidewalks? Were they added? If so, how are they designed? Dumbo mentioned that some streets didn't have sidewalks; did they add them?

Dubuque – emailed Jon

Dumbo District – emailed Paul

Philadelphia has sidewalks, however neither curbs nor sidewalks are not included in the "Historic Streets" district (cart path only).

Rock Island, IL, historic streets are all in residential areas.

Sacramento - Despite the fact that R Street supported major businesses, unlike the balance of the Central City (of Sacramento), the street was never fully improved to include comprehensive sidewalks, gutters and drainage. As a result it remained a relatively unimproved “working street” for truck and rail functions with patches of asphalt as necessary to reduce major pot holes, little or no sidewalks and limited drainage facilities.

Because R Street is still an active warehousing district, special designs considerations are necessary. “A fivefoot pathway along one side of R Street (but at the same level and with the same texture as the rest of the roadway) would be created which will be universally accessible. On-street industrial activities are maintained, such as the loading and unloading of freight trucks. The loading docks of former industrial buildings are delineated with industrial-style wire railings and converted into overflow space for retail and restaurants. Streetscape elements such as a steel trellis/shade structure, "I"-beam bollards, and utilitarian street lighting continue the industrial design language of the corridor.

To make the district ADA accessible, the following was mandated “a minimum 5' wide ADA-accessible pedestrian path will be provided on at least one side of the street throughout the entire corridor (however sidewalks are planned on both sides of the street). The pathway may jog mid-block from one side of the street to the other side. The mid-block crossing will be ADA compliant.”

Wichita – During improvements in the early 1990s, the City eliminated all curbs in Old Town; street and pedestrian lanes are now separated by an 8-inch band of buff colored cast concrete pavers. Pedestrians have the right of way.

Before restoration there were sidewalks on certain streets and they remain.. No additional sidewalks were added to keep the feel of the warehouse district.

The Dumbo photos are great, but similar detailed photos from other places are needed. A photo of the bike lane special pavers and crosswalk slab granite from Dumbo would be very helpful.

Above: Photo of pavers in Dumbo District, Brooklyn, NYC, reset at a 90 degree angle to define bike lane.

WAITING FOR PICTURES FROM PAUL KIDDER

Above: Photo of granite slab crosswalks (emailed Paul and asked for photos).

Has Philadelphia reconstructed any streets, or do they just fund ongoing maintenance? Emailed Alan and Laura – waiting to hear back

The curb extensions in Dubuque are interesting. How are they designed to fit into the historic character? Emailed Jon – waiting to hear back