

**PRELIMINARY
Summary of Findings and
Recommendations**

**Fulton Neighborhood Task
Force to Study Flooding**

December 5, 2001

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1.0 Background and Purpose of Task Force

In May and June 2001 Council Member Barret Lane and City of Minneapolis (City) engineer Rhonda Rae presented a plan (known as Option 13 as shown in Figure 1) to mitigate stormwater flooding in a 100-year event, in the area bordered by 50th and 52nd Streets and Chowen and York Avenues in the Fulton Neighborhood of Minneapolis.

Option 13 would include installation of 3 large (5-foot deep by 12-foot wide and 6-foot deep by 12-foot wide) underground storage tanks in the following areas:

- Chowen Avenue between 50th and 51st Streets (Tank size 5' x 12' x 600')
- 51st Street between Chowen and Beard Avenues (Tank size 6' x 12' x 300')
- 51st Street between Abbott and Zenith Avenues (Tank size 6' x 12' x 300')

Currently, 12-inch diameter pipes are predominant in this area. Option 13 includes construction of 36-inch diameter pipes installed in the following areas:

- Chowen Avenue between 51st and 52nd Streets
- 51st Street between Beard and Abbott Avenues

Many residents in the area expressed their concerns that trees would be removed during the construction work. The tank on Chowen Avenue between 50th and 51st Streets would require permanent removal of boulevard trees on the east side of the street. Trees could be replanted in residents' yards if desired. The tank on 51st Street between Chowen and Beard and the tank on 51st Street between Abbott and Zenith would require removal and replacement of boulevard trees.

Due to the residents concerns about Option 13, the Council Office and the Fulton Neighborhood Association (FNA) appointed a Task Force of concerned residents to study the issue, discuss residents' concerns, and consult with appropriate staff from various jurisdictions. The task force consisted of 13 members composed of members who were affected by tree removal, affected by flooding, non-affected residents who live in the area, appointees of the FNA, and appointees of Council Member Barret Lane. A representative from Christ the King Church was appointed because of the problems with flooding at the church. Since the inception of the Task Force, one Task Force member resigned and an additional representative from north of 50th Street was added because the proposed alternative includes construction north of 50th Street. The Task Force members include the following:

Residents Concerned About Tree Removal

Peter Griffin, 5045 Chowen Ave. S.

Janna King, 5016 Chowen Ave. S.

Sherry Van Duyn, 5049 Chowen Ave. S.

Residents Concerned about Flooding

Morgan Clawson, 5104 Abbott Ave. S.
Rita Coyles DeMeules (representing Christ the King)
John Whiting, 5153 Chowen Ave. S.

Non-Affected Residents Who Live in the Area

Jean Olson, 5105 Abbott Ave. S. (resigned)
Kevin Shannon, 5112 Abbott Ave. S.
Gregg Sougstad, 5212 Beard Ave. S.

Appointees of the FNA

Susan Priem, 5201 Chowen Ave. S.
Tom Steele, 5057 Ewing Ave. S.

Appointees of Council Member Barret Lane

Doug Mensing, 5025 Russell Ave. S.
Dean Raths, 5225 Chowen Ave. S.

The Task Force’s deadline for recommendations is December 12, 2001. The Task Force’s recommendation will be strongly considered by Barret Lane for implementation.

The Task Force has met approximately every other week since it’s inception on August 22, 2001. The majority of the meetings included discussions with public officials and resident testimony.

This report documents the Task Force’s guiding principles, findings and recommendations. The report is considered preliminary because the Task Force is waiting for input from the City on stormwater modeling and cost estimating of the recommended alternative.

1.1 History

The following information was taken from the City of Minneapolis’ web page on flooding in Fulton. The text may have been slightly modified to guide the reader to other sections of this report.

During large rainstorms – those events commonly referred to as 10- to 100-year events – stormwater in the area within the rough boundaries of Zenith to Chowen Ave. and 50th to 52nd St. is unable to enter the existing storm sewer system. Instead, the water floods streets, sidewalks, alleys, and some yards and homes. [Stormwater flows from between France and Xerxes Ave. and from 53rd St., but the study area, most likely to be affected by construction is between Zenith to Chowen Ave. and 50th to 52nd St.]

This flooding is the result of a lack of capacity within the existing storm sewer system. Stormwater in the project area drains to Lake Harriet via an existing pipe network. During heavy storms the capacity of the pipes north of 50th St.

is maximized. These pipes are unable to accept water from south of 50th St. Consequently, since that water cannot enter the pipes it floods back into streets, alleys, yards, and homes.

July 1997 - The City of Minneapolis experienced a series of rainstorms that overburdened the City's stormwater drainage system and caused back-ups into the sanitary sewage system, saturation of the soils, and overflow of lakes and streams.

October 1997 – The City of Minneapolis identified the most severe flood locations in the City and developed a mitigation plan. Locations selected for mitigation were based on:

1. Problem frequency – frequency of flooding or storm sewer back-ups.
2. Proposal effectiveness – extent to which proposal will alleviate problem.
3. Prior commitment – extent proposal continues a previous commitment to a project.
4. Coordination – extent proposal could be coordinated with other planned construction.
5. Problem magnitude – severity and extent of flooding or storm sewer back-ups, danger to public health, and property damage.
6. Effect on tax base – negative effect if land acquisition were required, positive if storm drains are upgraded and would allow for new developments.
7. Proposal costs – cost/benefit of project compared to other storm drain projects.

September 1999 - The Department of Public Works proposed to construct a new sewer pipe that would accept the excess water that cannot enter the existing pipe system. This new pipe would flow directly to Minnehaha Creek.

The Minnehaha Creek Watershed District – which has sole authority over the Creek – informed the City that it believed this solution increased the threat of flooding downstream and it would not issue permits to allow water to drain from the proposed pipe to the Creek. Over the last two years, the Watershed District has maintained this position. Therefore, the 1999 solution is not viable.

1999 to Present - Public Works - Sewer Design staff and a private consultant have modeled 15 different scenarios to eliminate the flooding. To be considered a viable plan, a proposal had to:

- Include new storm drain pipes and/or other capacity solutions that could carry water in a 10-year event, and eliminate flooding from homes in a 100-year event.

Be within the \$2.2 million budget projected to mitigate the problem efficiently.

Pass all regulatory requirements.

Of the 15 models studied only one met the above criteria – the one introduced on May 23 as Option 13, previously discussed. The models included everything from doing nothing to eliminating a block of homes. All 15 of the models are available at the City of Minneapolis website listed in Section 6.

A key challenge to finding a workable solution is that the neighborhood is virtually flat. Between the high point at 52nd and Chowen to Lake Harriet a mile away, the elevation change is 10 feet. This lack of fall for water to flow eliminates many solutions.

2.0 Guiding Principles

The following Guiding Principles were developed collectively by the Task Force to guide the Task Force during the exploration of alternative solutions. The Guiding Principles should be adopted and used by the City of Minneapolis to develop conceptual and final flooding design plans.

- The highest priority is placed on the flooding of homes, businesses and churches. A secondary priority is placed on the flooding of garages, followed in importance by yard and street flooding.
- Stormwater management and related engineering solutions should be implemented in harmony with other City and neighborhood concerns, including forestry and the quality of life in the neighborhoods.
- Residents of the area feel strongly that mature trees are very important to the character of the neighborhood. They also provide a variety of other important benefits -- shade, buffering of sound and light, etc. Trees are especially important to maintaining a residential atmosphere in an area affected by adjacent commercial properties.
- Achieving 100% of design standard for the 100-year rain event needs to be considered in the context of the budget and other neighborhood values.
- The budget (\$2.2 million) was based on a project that is not likely to be approved by the Minnehaha Creek Watershed District. If no other solutions within this budget are

found acceptable to the neighborhood the City should explore a phased project, which addresses the areas that experience the worst house flooding first.

- Pershing Park is common space for people throughout the neighborhood. Stormwater is a common problem. Parks are used throughout the country as part of stormwater management systems. We believe the Park Board and Public Works Department should cooperate to address a problem shared by all so that no single area of the neighborhood is unfairly burdened.
- Engineering solutions that include a negative impact (such as loss of trees) will be more politically acceptable if they are located near properties that experience flooding.
- Some non-traditional stormwater management techniques such as rain barrels, rain gardens, dry wells, infiltration cells, trenches, and retrofitting of large institutional parking lots with sunken parking lot islands and/or permeable pavements may reduce flooding on some properties and reduce the demand on the municipal stormwater management system.

3.0 Findings

The Task Force conducted the following activities in order to understand the problem, develop Guiding Principles, and assemble an alternative:

- Held discussions with various public officials including the City, County, Watershed District, and Parks and Recreational Department
- Conducted a survey in the area of flooding and reported results
- Learned about innovative stormwater management alternatives
- Conducted a survey of local real estate agents to assess property impact of flooding and tree removal
- Listened to public testimony related to flooding and tree removal
- Conducted a walking tour of the flooding areas and to look at trees

3.1 Discussions with Public Officials

In the first couple of Task Force meetings, key public officials were identified to invite to upcoming meetings. Key public officials included the following:

- City of Minneapolis Public Works Department, Engineering
- Minnehaha Creek Watershed District
- Minneapolis Parks and Recreation Department
- Minneapolis Parks and Recreation Department -- Forestry Department
- Hennepin County (Highway Department)

The discussions with the key officials usually lasted between 30 minutes and 2 hours and consisted of asking the questions to better understand the issues and options for resolving the flooding in harmony with other neighborhood values. Additional time was spent meeting with City engineering to understand the problem and options the City had previously analyzed. City engineering also provided maps and reports that the Task Force used throughout the meetings.

3.1.1 City of Minneapolis Engineering – Rhonda Rae

The following is a summary of key points presented by Rhonda Rae, (Project Engineer, City of Minneapolis) on September 5, 2001 to the Task Force.

- The stormwater pipe exiting from Chowen and 50th Street has a capacity of 38 cubic feet per second (cfs), whereas the size of pipe needed to carry the flow is 200 cfs.
- The stormwater design parameters established by Public Works are as follows:
 - Reduce flooding during a 10-year rain event
 - Protect homes for a 100-year event
- The Minnehaha Creek Watershed District is concerned with erosion and increasing peak flow within the creek. Lake Harriet flows into Minnehaha Creek over a 13 cfs weir (low flow). The Watershed District has appointed officers [board members that make final decisions for the District].
- Trees lost on boulevards in Option 13 (storage tanks on Chowen Ave. between 50th and 51st St.) would be replaced in people's yards if desired. The City generally has a policy that if one tree is removed two trees are provided for replacement. The size and location of installation of the trees is up to the City Park and Recreation Board forester. If they are planted on private property it would be up to the forester.
- The stormwater management budget for Fulton is \$2.2 million and has been carried over until next year. To change the budget, full City Council action is required (it takes 1 month to go through the process). Rhonda does not know how the Council would respond to another extension. There have been a lot of budget cuts in the last few years and public works budgets are very lean. City Council takes final action on 12/12/01, so Rhonda would need some time to prepare and present a revised alternative requiring additional budget.
- City engineering would be willing to assist the Task Force with cost estimating once we have some alternatives together. They need some time to complete that and will need to know before 12/12/01.
- Rhonda preferred Option 2 with discharge to Minnehaha Creek until the Watershed District staff indicated they could not approve this alternative until modeling was complete in 2003. Staff indicated that even then it would probably be difficult to secure a variance.
- Option 9, storage in Pershing Field, would resolve flooding issues on 49th St. but would not resolve flooding south of 50th Street.
- The flow of water naturally goes to Lake Harriet, not to Minnehaha Creek.
- Christ the King needs more on-site storage, such as a tank. They are only allowed a certain size discharge pipe to tie into the existing pipe.
- Flood reports were generated for 1978, 1988, and 1997.

- The City has looked into placing tanks under the Methodist Church parking lot or the funeral home, but that could impact the potential for flooding these areas.
- There is a large tank installed on the west side of Lake Calhoun in a parking lot. The tank is 12'x 8'x 400' and removes grit. Large tanks have not been installed in Minneapolis neighborhoods.
- The tanks proposed in Option 13 would be prefabricated and would be sloped to allow water to drain, but a sediment/grit collection area would retain debris and sediments. A loader or other equipment would be lowered into the tunnel for cleaning.
- Option 10 -- \$10.9 M microtunnel is literally a pipe dream. Nearly every block (or x number of feet) they need to drive sheet pile for an entrance for the tunneling equipment.
- The City has approached the University of Minnesota, Department of Civil Engineering through Dr. Stefan's Capstone program to task students to try to solve the Fulton flooding problem.
- Beard Avenue has fiber optics, DSL and other utilities running through it already. The Department of Health requires a 10-foot minimum distance between water and sanitary sewer piping. There is a water pipe on the west side of Chowen. The sanitary sewer on Chowen dates either to 1910 or 1938.

The Task Force requested and received copies of engineering reports listed in Section 6.0.

3.1.2 Minnehaha Creek Watershed District – Eric Evenson

The following is a summary of key points presented by Eric Evenson, (Minnehaha Creek Watershed District) to the Task Force on September 19, 2001.

- The Watershed District will not allow significant increases of water downstream.
- Eric believes that there needs to be multiple solutions to the Fulton flooding problem including:
 - Hold back or slow down water
 - Could hold back water, but that impacts people upstream
 - Determine what can be done within the watershed
 - Could hold back water in different areas (that's what Rhonda has been proposing)
 - Christ the King – they blame themselves for flooding
 - Could put tanks under parking lot
- Peter Griffin of the Task Force suggested placing a holding pond at York Park on the bank of Minnehaha Creek – It was later determined that the area within the City of Minneapolis is within the floodplain, and so it cannot be used as a holding pond. There is a portion of the Park that is located in Edina and it is unknown whether this area is within the floodplain.
- Could reduce the design parameters (e.g., design for 90% of flood peaks).
- Lots of innovative solutions are available for commercial and institutional properties including:
 - On-roof storage or other on-site storage

- Permeable pavements
- Implement future stormwater design requirements in the neighborhood
- Go to websites for more information – City of Minneapolis – Watershed District– MetCouncil – Hennepin County (Best Management Practices [BMPs] are shown on Met Council Website).
- Rain gardens can be placed in ditches to collect and slow water down (Fred Rozamulski at Barr Engineering Company is the consultant who is familiar with rain gardens).
- Watershed District wants to keep peaks on the hydrograph low (don't allow any additional water from any one peak).
- The Watershed District is open to variances although they are difficult to get and you would need to go before the Board to request a variance. Need to demonstrate that there is comparable damage here by not discharging the water and also that you wouldn't affect people downstream. Can get a permit within 60 days.

3.1.3 Minneapolis Park Board

The following is a summary of key points presented by Cliff Swenson, Bob Fine, Scott Neiman of the Minneapolis Park Board:

- Could place a large perforated drain tile system to allow water to infiltrate out of the pipe slowly (Park Board thought that Phelps Park near Chicago Ave. has a similar system).
- Park Board plans to reconstruct Pershing Park playing fields, hockey rink, horseshoe pits and other areas during the summer of 2002. This would be good timing to combine projects and the Park Board was interested in working together. The project probably won't start until mid summer. A conceptual plan has been initiated but design has not been completed.
- The Park Board was against options related to have the playing fields sunk and acting as a stormwater retention basin. The playing fields would take too long to dry and that would impact those using the fields. They currently have problems with ponding water and hope to change that with the upcoming construction project. They did not have a problem with the concept of tanks placed below the fields, although they seemed to prefer them placed below asphalt surfaces.
- The Park Board plans to put in turf for the playing fields and regrade the area to promote better drainage. The turf requires approximately 18 inches of soil below the turf. A tank could be placed below that, but may be easier to place a tank below the tennis courts or other asphalt surface.
- Armitage Park has done creative financing during their recent construction project. They took out a Neighborhood Revitalization Plan (NRP) loan for constructing the asphalt parking lot 3 years early because of the other related construction. They will repay the loan.
- The neighborhood needs to determine the level of flooding in the neighborhood that is acceptable.

3.1.4 City of Minneapolis, Forestry Department – Ralph Sievert

The following is a summary of key points presented by Ralph Sievert, Forestry Department of the Minneapolis Park Board to the Task Force on September 19, 2001.

- Forestry generally sticks with a certain type of tree on a block-by-block basis. They see what trees grow well in an area and continue with the same type. Forestry has worked with neighborhoods to decide on what type of tree to plant and to develop a plan for the boulevard/block/neighborhood.
- Different types of trees have different heights. For instance a crabapple tree with a 1¾-inch diameter trunk may be 8 – 10 feet tall versus a locust that may be 12 – 15 feet in height.
- Forestry developed a cost estimate for the value, removal and replanting costs for trees on Chowen between 50th and 51st, Chowen between 51st and 52nd, and on 51st from Zenith to Drew. This documentation is included in the meeting minutes in Appendix A.
- The largest tree that could be planted is a 6-inch diameter tree, but they are hard to find and cost more. Generally a 1¾-inch diameter tree is planted for boulevards, however that could be flexible depending on the City's budget.
- The City of Minneapolis uses Forestry as a contractor for sewer projects.
- Public works can plant trees on someone's yard, but Forestry cannot unless it's a City public works project.
- Trees can be moved from the boulevard into a yard if the tree is less than 6 inches in diameter and is spadable (roots can be dug up).
- If the soil is aerated and no structural damage is incurred to the tree, you can go into one-third of the radius of the root zone without causing too much damage. Structural damage could include driving equipment over tree roots.
- Forestry, with approval from the City, could assess what trees may be impacted from the project.
- The drip zone includes 1.5 feet per 1-inch diameter of tree trunk.
- More mature trees would be more significantly affected by structural damage.

3.1.5 Hennepin County Public Works – Jim Grube

The following is a summary of key points presented by Jim Grube of Hennepin County to the Task Force on October 17, 2001. Hennepin County has jurisdiction of 50th Street.

- Prior to 1998 Hennepin County was involved only in major overlay or construction projects on 50th Street, in cooperation with the City. Work was done based on City recommendations; consequently, the county does not know the reason for design decisions, like the high crown on 50th.
- Prior to 1998 Hennepin County was not involved with routine maintenance like potholes and snowplowing. They took over most aspects of routine maintenance in 1998, but didn't start snowplowing until the winter of 2000 – 2001.
- The City still has responsibility for traffic operations; this includes traffic signals and streetsweeping.

- In 1997, a 1.5-inch overlay was placed on 50th Street from Lyndale to France Avenues.
- The County is very willing to work with the City to move catch basins or perform other tasks that will help the flooding.
- The crown at 50th and Chowen seems to be acting as a dam; not sure if it is there for a reason, maybe for 49th St. flooding concerns.

3.2 Neighborhood Survey and Survey Results

A survey was mailed to 203 residents from Zenith to Chowen Ave. between 50th and 52nd Streets in early September 2001. A total of 79 households responded to the survey. Preliminary results assisted the Task Force in the early October walking tour of the neighborhood.

Mapping of the data corresponds with the city's topographic maps and reveals that the flooding is located in low areas that receive water from several directions. The most significant concentration of flooding is just south of the intersection of 51st and Abbott; and in the alley just south of 51st between Abbott and Beard. During extremely heavy flooding (once every several years) seven homes on both sides of Abbott reported water in the house. In addition, there is flooding in the alley between Abbott and Beard, which spills into yards; the survey identified four garages on both sides of the alley that experience flooding.

There is a concentration of street and yard flooding at the intersection on 52nd and Chowen, at 50th and Chowen, and along 51st between Chowen and Abbott, with the most extensive problem at the low spot by the alley between Abbott and Beard. One home/garage at the intersection of 51st and Beard located near this low spot experiences flooding during extremely heavy rains, as did one home near 50th and Chowen. A house at 52nd and Chowen experienced flooding prior to landscape improvements in about 1997. The alley between Beard and Chowen floods two homes and three garages during extremely heavy flooding (once every several years), and affects one home/garage during a typical year.

On Zenith, one home/garage/yard between 50th and 51st is flooded by water entering from the alley.

Christ the King experiences street flooding to the east on York; and flooding down the alley between York and Zenith into the parking lot. Stormwater floods the parking lots and has entered the basement through an external stairway and door. The church has extensive paved surfaces and the city limits the size of the stormwater drain from the church parking lots into the City storm sewer system.

The alley between Chowen and Drew is higher than the homes on Chowen. When the alley floods two garages and one home are affected; the home is only affected during extremely heavy rains (every several years). A garage on the south side of 52nd St.

between Beard and Chowen experiences flooding from the alley; the driveway appears to be lower than the alley.

There are several other isolated reports of house flooding, but these survey respondents did not indicate street or alley flooding. Based on the lack of water in the street or alley and a visual inspection of these homes, it would appear that flooding is related to individual site conditions rather than the design or capacity of the city's storm sewer system.

Summary of Results (see Appendix B for a detailed tabulation of the survey results) Please note the following results include *all survey reports of flooding*. Some of the responses regarding house flooding included in these counts may be related to individual site conditions rather than water collecting in the street or alley and flooding onto a yard and into a home.

The survey results report more flooding than what was reported by the City during public meetings in May and June 2001.

Flooding. The following tables summarize the results of responses to these two survey questions.

1. **Typical Year.** *In a typical year, about how many times does stormwater from a heavy rain collect in the following places on your property?*
2. **During an extremely heavy rain** *that may occur only once every several years, does stormwater collect in the following places on your property?*

Street - 31 households reported a total of 180 occurrences during a typical year. 36 households reported water in the streets during extremely heavy rain (every several years)

Typical Year	# Reported	% of Reports	Extremely Heavy	# Reported	% of Reports
51xx Abbott	7	23%	51xx Abbott	7	19%
50xx Chowen	7	23%	50xx Chowen	9	25%
51xx Chowen	7	23%	51xx Chowen	8	22%
			50xx Beard	5	14%

Note: 51xx Abbott indicates residences located on Abbott Ave. between 51st and 52nd St., addresses that start with 51.

Alley - 30 households reported a total of 195 occurrences during a typical year. 31 households reported water in the alley during extremely heavy rains. The most significant alley problems are located in the alley between Abbott and Beard just south of 51st, and the alley between Beard and Chowen, just north of 51st.

Typical Year	# Reported	% of Reports	Extremely Heavy	# Reported	% of Reports
51xx Abbott	8	27%	51xx Abbott	7	23%
51xx Beard	5	17%	51xx Beard	6	19%
50xx Chowen	4	13%	50xx Chowen	5	16%
50xx Beard	4	13%	50xx Beard	4	13%
			51xx Chowen	4	13%

Yard - 29 households reported a total of 154 occurrences in the typical year; 33 reported water in the yard during periods of extremely heavy rain.

Typical Year	# Reported	% of Reports	Extremely Heavy	# Reported	% of Reports
51xx Abbott	7	17%	51xx Abbott	8	24%
51xx Chowen	5	17%	51xx Chowen	6	18%
51xx Beard	4	14%	51xx Beard	5	15%
50xx Chowen	4	14%	50xx Chowen	5	15%
50xx Beard	4	14%	50xx Beard	4	12%

Garage - 14 households reported a total of 58 occurrences of garage flooding in a typical year. 17 households reported water in the garage during extremely heavy rains.

Typical Year	# Reported	% of Reports	Extremely Heavy	# Reported	% of Reports
51xx Abbott	5	36%	51xx Abbott	5	29%
50xx Beard	2	14%	50xx Beard	3	18%
51xx Beard	2	14%	51xx Beard	3	18%

House - 11 households reported a total of 32 occurrences of house flooding in the typical year. 17 households reported water in the house during extremely heavy rains.

Typical Year	# Reported	% of Reports	Extremely Heavy	# Reported	% of Reports
51xx Abbott	6	55%	51xx Abbott	8	47%
50xx Zenith	2 *	18%	50xx Zenith	2*	12%
50xx Chowen	2**	18%	50xx Chowen	2	12%
			50xx Beard	2	12%

* includes one residence and Christ the King Church

** includes one household that does not report street or alley flooding and is located on a hill

Trees. Residents were also asked the following question about the importance of trees.

3. On a scale of 1 to 5 with 5 being the most important, how important is the presence of mature shade trees to the character of the neighborhood? Respondents ranked the presence of mature trees very highly - the average (mean) ranking was 4.7 on a 5 point scale.

The ranking of the importance of trees varies by block as follows.

50xx Zenith	4.5
51xx Zenith	3.5
52xx Zenith	5.0
50xx Abbott	4.8
51xx Abbott	3.4
52xx Abbott	5.0
50xx Beard	4.5
51xx Beard	4.1
50xx Chowen	4.6
51xx Chowen	4.8
52xx Chowen	5.0

3.3 Innovative Stormwater Management Alternatives

Doug Mensing of the Task Force presented innovative stormwater management alternatives to the Task Force on October 17, 2001. A summary of key issues discussed is included below:

Basic Principles of Smart Stormwater Management:

1. You can't control where the rain falls, but you can often control what it hits, where it goes, and how fast.
2. There are alternatives to curbs, gutters, NURP ponds, and other conventional techniques that can decrease the rate and volume of stormwater while increasing water quality.
3. Better to manage stormwater as close as possible to where it falls or originates in a small-scale, diffuse manner (easier to deal with many small problems rather than one big one).
4. Impervious surfaces are the root of the problem.
5. So reduce and break up impervious surfaces, increase infiltration, and increase evapotranspiration.

* Options are somewhat limited in Fulton (and other built-up, urban communities) due to existing infrastructure and a general lack of open space to work with. But, there are still things that can be done to alleviate and *possibly* solve (or at least *manage*) the flooding problem.

Conventional engineered techniques that may apply to Fulton Flooding:

- Adjusting pipe/catch basin sizes, inlet capacities, or elevations (flow regulation)
- Install tanks
- Flap gates
- Interception/redirection techniques
- Designed temporary street storage (street berms)

Large-scale techniques that may apply to Fulton Flooding:

- Bioretention/biofilter wetlands/ponds – typically <10% of treatment area
- Wetland restoration/creation
- Permeable pavement systems and permeable pavers

Small-scale techniques that may apply to Fulton Flooding:

- Native landscaping
- Rain gardens
- Rain barrels
- Downspout disconnection
- Weep walls
- Vegetated swales (infiltration and/or bioretention)
- Dry wells/infiltration cells/trenches
- Sunken parking lot islands and tree boxes
- Remove curb & gutter and/or curb cuts
- Green roofs
- Permeable pavement systems and permeable pavers
- Breaking up impervious areas
- Deep aeration?

Social techniques that may apply to Fulton Flooding:

Implement a stricter stormwater ordinance in flood-prone watersheds of Minneapolis such that new developments and redeveloped areas need to manage all stormwater generated from their property (such ordinances exist in other cities (Chicago) and related alternative stormwater management ordinances are being drafted in MN).

3.4 Real Estate Survey Results

Kevin Shannon of the Task Force surveyed 14 local real estate agents to estimate the loss of property value due to flooding or due to lack of boulevard trees. Nine real estate agents responded and the survey results are summarized in Appendix C. Responses were varied because the value of trees and flooding varies from buyer to buyer. Basement flooding is more detrimental to property value than yard or garage flooding. Basement flooding has a greater impact on the value of an individual house, whereas loss of trees on an entire block reduces property value of the block.

3.5 Resident Testimony

Several people have voiced concerns about both potential loss of trees and current flooding of their house and/or property. The following is a list of key issues:

Trees

- Loss of property value for entire block if trees from a block are lost permanently
- Trees block light and noise from 50th Street
- Tree loss reduces shade and increases need for air conditioning and energy needs
- Trees use water that would otherwise flow into the streets and increase stormwater volume
- Trees provide a pleasant ambiance, established neighborhood feel that would be eliminated with the loss of trees

- The boulevard trees provide a barrier and security to residents and children on the sidewalk and in their yards, and removal of trees would eliminate that barrier
- Tree loss increases perceived encroachment of 50th Street businesses into the residential area
- Several residents have spent money and time taking care of the trees on their boulevard including watering the trees and injecting elms to avoid Dutch elm disease.

Flooding Problems

- Loss of property value
- Repair of property
- Loss or damage of personal property within house
- No way to avoid or plan for it
- Causes mold-related health issues

Other Issues

- The crown at 50th Street and Chowen Ave. is difficult to cross over with a vehicle and trailer because of the clearance. In the winter, a large number of vehicles get stuck at this intersection because of the crown and buildup of ice and snow.

On November 19, the Fulton Neighborhood was invited to give public testimony to the Task Force regarding the neighborhood flooding and the possible removal of trees. Four neighbors gave public testimony — two affected by possible tree removal, one affected by flooding, one affected by both, and one neighbor not affected by either. Their thoughts are summarized below:

Tom Harmon, 5012 Chowen, testified that he experiences yard flooding and would be affected by tree removal. A planned expansion of his home was stopped because of the proposed tree removal. Additional concerns included possible mosquito/health problems caused by installation of tanks, possible icing and frost line problems caused by the tanks, “blighting” of the neighborhood because tree removal would cause the street to always appear odd, and the subsequent effect on real estate values of the affected homes. Mr. Harmon testified that 25 homeowners would be affected by tree removal and only 9 are affected by flooding. This in effect would trade one problem for another and is not an equitable solution. A letter Mr. Harmon wrote is included in Appendix D.

Thais O’Shea, 5015 Chowen, testified that she is not affected by flooding, but would be affected by removal of trees. She would lose two, possibly three trees. Ms. O’Shea feels that the trees are a breakfront from noise and pollution from 50th St. The trees help to separate her property from the commercial property at 50th and Chowen, and removal of the trees would cause her to become more part of the commercial district and less part of the neighborhood. She feels that the trees add significant dollar value to her property, and loss of the trees would significantly affect her estate.

Margaret Kloster, 5140 Chowen, is affected by street and yard flooding in front of her home. Although she would like to see this problem solved, she is in favor of keeping the mature trees in the neighborhood.

George West, 4120 Chowen, is unaffected by flooding or tree removal. He testified that he is concerned about possible commercial creep that would occur if trees were removed at 50th and Chowen. He has noted a significant increase in street traffic on 51st St. since the development of the northeast corner of 50th and France.

4.0 Alternative Analysis

The alternative analysis was started by brainstorming and listing possible components or pieces of alternatives. Alternative analysis included the following ideas:

- Phased project (completed over more than one year and may include additional funding)
- Tanks in areas of flooding:
 - Tank in or near to Christ the King Church
 - Tank(s) on 51st Street
 - Tank near intersection of 52nd and Chowen
- Tank in Pershing Park (shared space)
- Partial tank on Chowen in area of small or limited trees in the middle of the block (preserving the more mature trees)
- Research the piping configuration under 50th and Chowen (initially unsure whether water flows correctly in this area; however, City stated that it does flow correctly)
- Require additional hard surfaces at 50th and France (e.g., parking lots) to be permeable or require stormwater storage tanks for future work
- Holding pond by Minnehaha Creek between York and Abbott (need to determine if there is an ownership issue, and while York Park is considered to be within the floodplain in Minneapolis, a portion of this area is located in Edina and we are unsure whether it is in the floodplain).
- Increase the diameter of stormwater pipes
- Use large stormwater pipes for storage
- Reconsider design parameters/criteria (e.g., have design meet a certain percentage of the design criteria)
- Request a Minnehaha Creek Watershed District variance to relieve 52nd Street area of stormwater from France to Xerxes or some portion of that area
- Cut down the crown or construct a channel at the intersection of 50th and Chowen
- Reduce run-by flow (water rushes by grates and migrates to low areas); intercept high flow areas
- Try to find alternatives that would not require the use of tanks (tanks have negative features including difficult to clean, may be source of insects, odors, create icy surface in the winter because of air underneath road, cause frost to move to greater depths impacting sanitary sewers located beneath the tanks, etc.)
- Explore alternative stormwater management techniques that could help relieve flooding problems

The Task Force then attempted to assemble components into alternatives to meet the Guiding Principles and meet City engineering design criteria. Several alternatives were assembled and discussed with City engineering to determine whether the alternatives would meet City design criteria for stormwater management, would be implementable and would meet the City's original \$2.2 million budget. These alternatives were generally hybrids of previous alternatives prepared by the City engineers and are not discussed in detail here but can be found in Appendix A within the meeting minutes.

Several alternatives or components were not considered feasible for the following reasons:

- Standard engineering design criteria such as Minnesota Department of Health requires 10-foot spacing between sanitary sewer piping and water piping
- Other utilities are in areas where tanks or pipes could be placed
- Cannot design an alternative that would negatively impact a downstream neighborhood
- Alternatives not within the City's original \$2.2 million budget – unless phased
- Component would be considered negatively by the City and would require City Council Action
- Incorrect stormwater flow design

From the Task Forces understanding of the problem, collecting information from City officials and resident testimony, alternative assembly and screening process, the stormwater system is very complicated and there are not many alternatives that meet the Task Force's Guiding Principles, City engineering requirements, are feasible and within the City's original \$2.2 million budget.

In addition, the Task Force reviewed the City's Option 13. This alternative does not meet the Guiding Principles of the Task Force and is therefore unacceptable.

5.0 Recommendations

Based on the component and alternative analysis discussed above the Task Force recommends the following alternative. The alternative is composed of primary and secondary components. The primary components address the majority of the stormwater. The secondary components include options for assisting in stormwater management on both a smaller scale such as catching run-by stormwater, innovative stormwater management, assistance or education to institutions or residents, and government controls such as permits.

Primary Components

The recommended alternative consists of a phased approach. Phase I includes placement of tanks or piping in areas of house flooding following the Task Force's Guiding Principles. Phase II would be implemented if Phase I does not meet the stormwater

management goals. Phase II would be combined with flood mitigation efforts with the neighborhood north of 50th Street for placement of tanks under paved surfaces within Pershing Park. Phase II may require additional piping to Pershing Park from the neighborhood south of 50th Street. Phase I and II should protect homes for 10-year and 100-year flood events as described in the Guiding Principles.

Phase I consists of tanks installed on 51st Street between Chowen and Beard (one tank) and between Abbott and Zenith (one tank) and large pipes or small tanks on Chowen between 50th Street and 52nd Street, possibly extending toward 53rd if additional capacity is needed, and it is appropriate from a design perspective. The pipes or tanks should be installed so that either minimal damage to boulevard trees takes place or that boulevard trees will be replaced at the end of construction. Permanent removal of boulevard trees is unacceptable. Removal of mature boulevard trees in the 50xx block of Chowen is not acceptable under the Task Force's Guiding Principles as follows.

"Residents of the area feel strongly that mature trees are very important to the character of the neighborhood. They also provide a variety of other important benefits -- shade, buffering of sound and light. Trees are especially important to maintaining a residential atmosphere in an area affected by adjacent commercial properties."

Another variation on this alternative is to review new information from recently installed Minnehaha Creek stormwater gauges to recalculate the impact of adding stormwater to the Creek. This information could be compiled in the next 1 to 2 years prior to final decision on Phase II.

Secondary Components

Secondary components should be included with the primary components discussed above and include the following:

- Intercept water in alleys and direct to storm sewer system.
- Install jake grates or other structure to prevent run-by flow on York into Christ the King parking lot
- Implement City permits for commercial/retail/institutional establishments to not allow increase in stormwater runoff from new developments or modifications to existing properties. We understand an existing City ordinance is in place for this, but want to make sure that future development or redevelopment stormwater impacts to existing neighborhoods is understood.
- Allocate some percent to be determined (approximately 1 – 10%) of total project budget to assist neighborhood with innovative stormwater management (in particular, large facilities (e.g. schools, churches) may benefit from these techniques or possibly residents with flooding issues not correctable from stormwater redesign). This may also include retrofit of current large institutional parking lots and homeowner education (may require City Council action).

- Modify crowns on 50th and Chowen and 52nd and Chowen - if feasible and does not impact those downgradient.

This alternative is meant to be conceptual and additional work will be required by the City to perform stormwater modeling and cost estimating to determine whether this alternative is feasible. City engineering should adopt the Task Force's Guiding Principles as part of their final design criteria. The Task Force understands they will have the opportunity to review the conceptual and final designs.

Should the alternative discussed above not be: 1) feasible, 2) within the \$2.2 million budget or 3) approved by City Council, we recommend that the City adopt the Task Force's Guiding Principles to develop additional alternatives, using a phased approach and higher budget as necessary.

6.0 Additional Sources of Information

The following reports and websites were visited and reviewed as part of the work completed by the Task Force. The websites and reports provide valuable insight into the flooding problems.

Internet Web Sites

<http://www.ci.minneapolis.mn.us/citywork/city-council/ward13/flooding/index.shtml> – City of Minneapolis web page discussing flooding and flood and stormwater definitions.

<http://www.minnehahacreek.org> – Minnehaha Creek Watershed District webpage. Discusses organization and Rule N that regulates how much water a government body may send to Minnehaha Creek.

ftp://lowimpactdevelopment.org/pub/Street_Storage_Factsheet.pdf – This fact sheet was presented at one of the meetings and addresses one city's approach to successfully managing urban flooding.

<http://lowimpactdevelopment.org> – Discusses numerous alternative stormwater management techniques, some of which may apply to Fulton's flooding issues.

Engineering Reports

City of Minneapolis, 2001. Flood Area 29, 15 Options. See City of Minneapolis webpage listed above.

City of Minneapolis, 1997. 1997 Problem Flooding Areas, Prepared by the City of Minneapolis, Department of Public Works, October 15, 1997.

City of Minneapolis, 1978. Flooding in Minneapolis, Prepared by City of Minneapolis Department of Public Works, July 12, 1978, Revised on August 15, 1978.

Federal Emergency Management Agency, Federal Insurance Administration, 1981.
Floodway Flood Boundary and Floodway Map, City of Minneapolis, Minnesota,
Hennepin County, Panel 12 of 12, Community-Panel Number 270172 0012 B
Effective Date: February 18, 1981.

Houston, 2000. Lake Harriet Drainage Analysis, Prepared for the City of Minneapolis,
Prepared by Houston Engineering, Inc., October 12, 2000. Engineering report
documenting existing conditions hydrologic and hydraulic model for the flood
area and analyzing selected options using the model.