

# Prioritization Methodology Report

## *For Urban Drainage Projects*



**December 2006**



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**PRIORITIZATION METHODOLOGY REPORT  
PHASE 2B URBAN DRAINAGE PRELIMINARY ENGINEERING STUDY  
WATERSHED MANAGEMENT DIVISION  
CITY OF LINCOLN, NEBRASKA**

## Introduction

A prioritization methodology was developed for the City of Lincoln to set priorities and implement stormwater Capital Improvement Programs (CIP) each year. Two project ranking systems were developed in coordination with the City, JEO team and engineering peer review group. Separate ranking systems were developed for closed (underground stormwater systems) and open (open channel drainage systems) system projects, developed as part of the Urban Drainage Preliminary Engineering Study. The ranking systems were designed such that both open and closed system project rankings could be compared directly. Refer to Appendix A for the report prepared by the Heartland Center for Leadership Development describing the process used to develop prioritization methodology. A separate prioritization methodology has been developed for the CIP projects resulting from watershed master planning efforts.

The process of the project ranking system requires evaluation and identification of the pipe and inlet deficiencies to determine inadequate channels and culverts, determining the extent of structural and non-structural flooding potential, and determination of the existing infrastructure condition for any drainage system in a given watershed.

## Definitions of Key Terms

- **Minor Storm:** Minor storm shall be defined as the storm event having a 20% or 10% chance of being equaled or exceeded in magnitude in any given year (also known as the 5-year or 10-year storm). As per City's design criteria manual, minor storm event is 5-year storm for residential area and 10-year storm for industrial/commercial area.
- **Major Storm:** Major storm shall be defined as the storm event having a one percent chance of being equaled or exceeded in magnitude in any given year (also known as the 100-year storm event). As per City's design criteria manual, major storm event is 100-year storm event for residential area and industrial/commercial area.
- **Structural Flooding:** Flooding which causes structures to be encroached with flood water.
- **Structural Flooding Frequency:** The term structural flood frequency is used to describe the regularity of flooding to which a particular structure is exposed.
- **Minor Storm Structural Flood Frequency:** A recurrence of structural flooding during minor storm event.
- **Major Storm Structural Flood Frequency:** A recurrence of structural flooding during major storm event.

- **Non-Structural Flooding:** Flooding which causes storm water to pond on the street, public or private property for extended period of time without encroaching any structure. The non-structural flooding potential was evaluated for minor storm event only. As per the City design standards, the non structural flooding is expected to occur during the major storm event.
- **Non-structural Flooding Potential – High:** The non-structural flooding potential is considered “high” if it meets any one of the following criteria:
  - Poned depth at street inlet is greater than 1 foot
  - For pipes < 24 - inch in diameter, minor storm event discharge > 15 cfs over the pipe capacity
  - For pipes ≥ 24 - inch in diameter, minor storm event discharge > 40 cfs over the pipe capacity
  - The street culvert overtopping frequency < minor storm event
  - Sump area overland flow through private property due to drainage system deficiencies
- **Non-structural Flooding Potential – Low:** The non-structural flooding potential is considered “low” if it meets any one of the following criteria:
  - Poned depth at street inlet is between 0.5 feet and 1.0 foot
  - For pipes < 24 - inch in diameter, minor storm event discharge ≤ 15 cfs over the pipe capacity
  - For pipes ≥ 24 - inch in diameter, minor storm event discharge ≤ 40 cfs over the pipe capacity
  - Minor storm event < Street culvert overtopping frequency < 50-year event
  - Pipe deficiencies on private property (No sump area overland flow)
- **Inlet Deficiency – High:** The inlet deficiency is considered “high” if:
  - Poned depth of the inlet ≥ 1.0 foot
- **Inlet Deficiency – Low:** The inlet deficiency is considered “low” if:
  - 0.5 foot < Poned depth of the inlet < 1.0 foot
- **Pipe Deficiency – High:** The pipe deficiency is considered “high” if:
  - For pipes < 24 - inch in diameter, minor storm event discharge > 15 cfs over the pipe capacity
  - For pipes ≥ 24 - inch in diameter, minor storm event discharge > 40 cfs over the pipe capacity
- **Pipe Deficiency – Low:** The pipe deficiency is considered “low” if:
  - For pipes < 24 - inch in diameter, minor storm event discharge ≤ 15 cfs over the pipe capacity
  - For pipes ≥ 24 - inch in diameter, minor storm event discharge ≤ 40 cfs over the pipe capacity
- **Culvert Deficiency – High:** The culvert deficiency is considered “high” if:
  - Roadway overtopping occurs at a frequency ≥ the 10-year storm event
- **Culvert Deficiency – Low:** The culvert deficiency is considered “low” if:
  - Roadway overtopping frequency ≥ the 50-year storm event and < the 100-year storm event
- **Open Channel Deficiency – High:** The open channel deficiency is considered “high” if:
  - Open channel capacity within defined banks < 50-year storm event peak discharge
- **Open Channel Deficiency – Low:** The open channel deficiency is considered “low” if:
  - Open channel capacity within defined banks ≥ the 50-year storm event peak discharge and < the 100-year storm event
- **Overland Flow Path:** Path where storm water runoff in excess of pipe and inlet capacity flows, whether planned or not.
- **Ponding Limits:** The limits of flooding in a sump area as determined by the ponded depth of an inlet or the existing topography.
- **Sump Area:** A low lying area with potential for ponding.

## Closed System Prioritization

### **Prioritization Categories**

The following prioritization categories were developed for the purpose of project ranking:

1. Structural Flooding: Flooding which causes structures to be encroached by floodwater. The structural flooding potential was identified through hydrologic and hydraulic analysis, study of topographic maps, field investigation and recorded historic problems. If structural flooding on a property occurs as a result of the grading or other changes made by the private entity, the City may choose not to consider structural flooding in its priority ranking. The structural flooding category is further divided into the severity of the flooding potential by having a higher multiplier for the minor storm event structural flooding frequency as compared to the major storm event structural flood frequency.
2. Non-Structural Flooding: Flooding which causes storm water to pond on the street, public or private property for an extended period of time without encroaching any structure. The non-structural flooding potential in the study area was evaluated for the minor storm event. The non-structural flooding potential was identified through hydrologic and hydraulic analysis, study of topographic maps, field investigation and recorded historic problems. If non-structural flooding on a property occurs as a result of the grading or other changes made by the private entity, the City may choose not to consider non-structural flooding in its priority ranking. The non-structural flooding category is further subdivided to account for the severity of the flooding by having a higher multiplier for the flooding on arterial street right-of-way.
3. Existing Infrastructure Condition: This category includes the structural condition and maintenance frequency for the given underground stormwater drainage system. The information for this category was obtained from the City maintenance staff. The existing condition of the system was determined by field investigation and reviewing maintenance records. This category is subdivided into three categories to address the severity of the problem.
4. Miscellaneous Factors: Miscellaneous factors include health and safety, critical locations, community development, downstream impacts, complaints, undeveloped/developed area, cost, legal issues and links to other improvements to be considered in the prioritization system. The ranking points for this category were provided by the watershed management staff.

### **Closed System Prioritization Ranking Worksheet**

A prioritization ranking worksheet was used to prioritize each proposed closed system drainage improvement project. Figure 1 on page 4 is an example of the closed system prioritization ranking worksheet.

Figure 1, Example Closed System Prioritization Ranking Worksheet

Prioritization Ranking for Urban Drainage Improvements - Closed System City of Lincoln, Nebraska				Issues Addressed		
Prepared By: JEO Consulting Group, Inc.		Date: _____				
Project ID: _____	Drainage Basin: _____					
Project Location: _____						
<b>Structural Flooding</b>				Structural Flooding		
Number of Structures Inundated	(Number and description of Structure)	Points, P <sub>SI</sub>				
5 or more Structures		35				
1 to 4 Structures		25				
Zero Structures		0				
		P <sub>SI</sub> = 0	0			
Structural Flood Frequency*		Multiplier, C <sub>FF</sub>				
Minor Storm Event		8				
Major Storm Event		4				
None		0				
		C <sub>FF</sub> = 0	0			
			<b>A = P<sub>SI</sub> * C<sub>FF</sub></b>	0		
<b>Non-Structural Flooding</b>				Non-Structural Flooding, Inadequacy of Existing Drainage Structures		
Non-Structural Flood Potential*	(Number of Blocks Flooded)	Points, P <sub>NS</sub>				
High		25				
Low		15				
None		0				
		P <sub>NS</sub> = 0	0			
Flooding Type		Multiplier, C <sub>FT</sub>				
Arterial Street Right-of-Way		3				
Private Property (Outside Street Right-of-Way)		2				
Street Right-of-Way		2				
		C <sub>FT</sub> = 0	0			
			<b>B = P<sub>NS</sub> * C<sub>FT</sub></b>	0		
<b>Existing Infrastructure</b>				Condition of Drainage Structures, Maintenance Frequency, Erosion		
Condition and Maintenance		Points, P <sub>CM</sub>				
Poor Condition, High Maintenance		75				
Fair Condition, Average Maintenance		25				
Good Condition, Low Maintenance		0				
		P <sub>CM</sub> = 0	0			
			<b>C = P<sub>CM</sub></b>	0		
<b>Prioritization Ranking Summary</b>				Links to Other Improvements, Isolated Flooding, Legal Issues, Downstream Impacts, Complaints, Undeveloped/Developed Area, Cost, Community Development, Health & Safety		
SUBTOTAL, X = A + B + C			0			
Miscellaneous Factors may be used to adjust scoring:						
P <sub>ADD</sub> (add up to 150 points)		_____				
May include: Health & Safety, Critical Locations, Community Development, Additional Considerations						
P <sub>SUB</sub> (subtract up to 50 points)		_____				
May include: Downstream Impacts, Legal Issues, Additional Considerations						
TOTAL = X + P <sub>ADD</sub> - P <sub>SUB</sub>			0			
<b>TOTAL for PROJECT XXXX-XX</b>			<b>0</b>			
<b>Additional Considerations:</b> (Links to Other Improvements, Isolated Flooding, Complaints, Cost, Other)						
_____						
_____						
_____						
_____						
_____						
Note: This prioritization ranking methodology is not intended for Watershed Master Plan projects						

## Open System Prioritization

### **Prioritization Categories**

The following prioritization categories were developed for the purpose of project ranking:

1. Flooding Impact: Flooding which causes structures to be encroached by floodwater. The structural flooding potential was identified through hydrologic and hydraulic analysis, study of topographic maps, field investigation and recorded historic problems. If structural flooding on a property occurs as a result of the grading or other changes made by the private entity, the City may choose not to consider structural flooding in its priority ranking. The structural flooding category is further divided into the severity of the flooding potential by having a higher multiplier for the 10-year storm event structural flooding frequency as compared to the 100-year storm event structural flood frequency.
2. Culvert Capacity: The amount of flow a structure can convey prior to overtopping. The overtopping frequency was identified through hydrologic and hydraulic analysis, study of topographic maps and field investigation. The culvert category is further divided into the severity by having a higher multiplier for the overtopping street type (arterial street compared to a non-arterial street).
3. Open Channels: This category includes the condition and capacity for the given open channel system. The information regarding the condition of the channel was obtained from field visits and from City maintenance staff. This category is subdivided to address the severity of the erosion condition: threatening to structures, roadways or other infrastructure; or threatening to natural resources or properties. The capacity of the channel was identified through hydrologic and hydraulic analysis. The open channel category is further divided by having a higher multiplier based on deficiency: insufficient capacity to convey expected 50-year peak flows; insufficient capacity to convey expected 100-year peak flows.
4. Miscellaneous Factors: Miscellaneous factors include health and safety, critical locations, community development, downstream impacts, complaints, undeveloped/developed area, cost, legal issues and links to other improvements to be considered in the prioritization system. The ranking points for this category were provided by the watershed management staff.

### **Open System Prioritization Ranking Worksheet**

A prioritization ranking worksheet was used to prioritize each proposed open channel drainage improvement project. Figure 2 on page 6 is an example of the open channel prioritization ranking worksheet.

Figure 2, Example Open System Prioritization Ranking Worksheet

Prioritization Ranking for Urban Drainage Improvements - Open System City of Lincoln, Nebraska													
Prepared By: JEG Consulting Group, Inc.	Date: _____	Issues Addressed:											
Project ID: _____	Drainage Basin: _____												
Project Location: _____													
<b>Flooding Impact</b>													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">Flooding Type</th> <th style="width: 40%;">Points, <math>P_{FI}</math></th> </tr> <tr> <td>Structural</td> <td style="text-align: center;">30</td> </tr> <tr> <td>Non-Structural</td> <td style="text-align: center;">10</td> </tr> <tr> <td colspan="2" style="text-align: right;"><math>P_{FI}^A = 0</math></td> </tr> </table>	Flooding Type	Points, $P_{FI}$	Structural	30	Non-Structural	10	$P_{FI}^A = 0$			Flooding Impact			
Flooding Type	Points, $P_{FI}$												
Structural	30												
Non-Structural	10												
$P_{FI}^A = 0$													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">Flood Frequency</th> <th style="width: 40%;">Multiplier, <math>C_{FF}</math></th> </tr> <tr> <td>10-year Storm Event</td> <td style="text-align: center;">6</td> </tr> <tr> <td>100-year Storm Event</td> <td style="text-align: center;">2</td> </tr> <tr> <td colspan="2" style="text-align: right;"><math>C_{FF}^A = 0</math></td> </tr> </table>	Flood Frequency	Multiplier, $C_{FF}$	10-year Storm Event	6	100-year Storm Event	2	$C_{FF}^A = 0$						
Flood Frequency	Multiplier, $C_{FF}$												
10-year Storm Event	6												
100-year Storm Event	2												
$C_{FF}^A = 0$													
<b>A = <math>P_{FI}^A \times C_{FF}^A</math></b>		0	0	0									
<b>Culverts</b>													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">Deficiency (Overlapping Frequency)<sup>1</sup></th> <th style="width: 40%;">Points, <math>P_{CB}</math></th> </tr> <tr> <td>High (&lt; 10-year)</td> <td style="text-align: center;">30</td> </tr> <tr> <td>Low (10-year &lt; Overlapping Frequency &lt; 50-year)</td> <td style="text-align: center;">15</td> </tr> <tr> <td>None (&gt; 50-year)</td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="2" style="text-align: right;"><math>P_{CB}^B = 0</math></td> </tr> </table>	Deficiency (Overlapping Frequency) <sup>1</sup>	Points, $P_{CB}$	High (< 10-year)	30	Low (10-year < Overlapping Frequency < 50-year)	15	None (> 50-year)	0	$P_{CB}^B = 0$			Culverts	
Deficiency (Overlapping Frequency) <sup>1</sup>	Points, $P_{CB}$												
High (< 10-year)	30												
Low (10-year < Overlapping Frequency < 50-year)	15												
None (> 50-year)	0												
$P_{CB}^B = 0$													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">Street Type</th> <th style="width: 40%;">Multiplier, <math>C_{ST}</math></th> </tr> <tr> <td>Arterial</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Non-Arterial</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Other</td> <td style="text-align: center;">1</td> </tr> <tr> <td colspan="2" style="text-align: right;"><math>C_{ST}^B = 0</math></td> </tr> </table>	Street Type	Multiplier, $C_{ST}$	Arterial	3	Non-Arterial	2	Other	1	$C_{ST}^B = 0$				
Street Type	Multiplier, $C_{ST}$												
Arterial	3												
Non-Arterial	2												
Other	1												
$C_{ST}^B = 0$													
<b>B = <math>P_{CB}^B \times C_{ST}^B</math></b>		0	0	0									
<b>Open Channels</b>													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">Condition / Erosion</th> <th style="width: 40%;">Points, <math>P_{CE}</math></th> </tr> <tr> <td>Threatening to structures, roadways or other infrastructure</td> <td style="text-align: center;">40</td> </tr> <tr> <td>Threatening to natural resources or properties</td> <td style="text-align: center;">20</td> </tr> <tr> <td>Not Significant</td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="2" style="text-align: right;"><math>P_{CE}^C = 0</math></td> </tr> </table>	Condition / Erosion	Points, $P_{CE}$	Threatening to structures, roadways or other infrastructure	40	Threatening to natural resources or properties	20	Not Significant	0	$P_{CE}^C = 0$			Open Channels	
Condition / Erosion	Points, $P_{CE}$												
Threatening to structures, roadways or other infrastructure	40												
Threatening to natural resources or properties	20												
Not Significant	0												
$P_{CE}^C = 0$													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">Deficiency (Capacity)<sup>2</sup></th> <th style="width: 40%;">Multiplier, <math>C_{OC}</math></th> </tr> <tr> <td>High (&lt; 50-year)</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Low (50-year &lt; Capacity &lt; 100-year)</td> <td style="text-align: center;">2</td> </tr> <tr> <td>None (&gt; 100-year)</td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="2" style="text-align: right;"><math>C_{OC}^C = 0</math></td> </tr> </table>	Deficiency (Capacity) <sup>2</sup>	Multiplier, $C_{OC}$	High (< 50-year)	3	Low (50-year < Capacity < 100-year)	2	None (> 100-year)	0	$C_{OC}^C = 0$				
Deficiency (Capacity) <sup>2</sup>	Multiplier, $C_{OC}$												
High (< 50-year)	3												
Low (50-year < Capacity < 100-year)	2												
None (> 100-year)	0												
$C_{OC}^C = 0$													
<b>C = <math>P_{CE}^C \times C_{OC}^C</math></b>		0	0	0									
<b>Condition and Maintenance</b>													
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">Structural Condition / Maintenance</th> <th style="width: 40%;">Points, <math>P_{SC}</math></th> </tr> <tr> <td>Poor Condition, High Maintenance</td> <td style="text-align: center;">75</td> </tr> <tr> <td>Fair Condition, Average Maintenance</td> <td style="text-align: center;">25</td> </tr> <tr> <td>Good Condition, Low Maintenance</td> <td style="text-align: center;">0</td> </tr> <tr> <td colspan="2" style="text-align: right;"><math>P_{SC}^D = 0</math></td> </tr> </table>	Structural Condition / Maintenance	Points, $P_{SC}$	Poor Condition, High Maintenance	75	Fair Condition, Average Maintenance	25	Good Condition, Low Maintenance	0	$P_{SC}^D = 0$			Condition and Maintenance	
Structural Condition / Maintenance	Points, $P_{SC}$												
Poor Condition, High Maintenance	75												
Fair Condition, Average Maintenance	25												
Good Condition, Low Maintenance	0												
$P_{SC}^D = 0$													
<b>D = <math>P_{SC}^D</math></b>		0	0	0									
<b>Prioritization Ranking Summary</b>													
		<b>SUBTOTAL, X = A + B + C + D</b>		0									
Miscellaneous Factors may be used to adjust scoring:													
$P_{Adj}$ (add up to 150 points) May include: Health & Safety, Critical Locations, Community Development, Additional Considerations				0									
$P_{Sub}$ (subtract up to 50 points) May include: Downstream Impacts, Legal Issues, Additional Considerations				0									
		<b>TOTAL = X + <math>P_{Adj}</math> - <math>P_{Sub}</math></b>		0									
		<b>TOTAL for PROJECT XXXX-XXX</b>		0									
<b>Additional Considerations:</b> (Links to Other Improvements, Isolated Ponding, Complaints, Cost, Other)													
_____ _____ _____													
Note: This prioritization ranking methodology is not intended for Watershed Master Plan projects													

Prioritization Ranking, and Links to Other Improvements, Isolated Ponding, Legal Issues, Downstream Impacts, Complaints, Underrepresented Areas, Civil Community Development, Health and Safety

**APPENDIX A**

**CAPITAL IMPROVEMENT PROGRAM  
PRIORITIZATION METHODOLOGY OF  
URBAN STORMWATER SYSTEMS**

**FINAL REPORT**

**PREPARED FOR  
THE CITY OF LINCOLN  
PUBLIC WORKS AND UTILITIES DEPARTMENT  
WATERSHED MANAGEMENT DIVISION**

**BY  
THE HEARTLAND CENTER FOR LEADERSHIP DEVELOPMENT  
JULY 2004**



## **PROJECT SUMMARY**

In 2004 the City of Lincoln conducted a stormwater study project to analyze drainage and identify deficiencies in 17 drainage basins around the city. The purpose of this project was to use the results of this and subsequent studies to develop criteria, a ranking system, and a prioritization methodology for identifying stormwater improvements projects for urban drainage system upgrades, rehabilitation and system extensions. The City and the consultants assembled an engineering peer review group to assist with this project. The peer review group provided input and suggestions regarding the prioritization criteria and appropriate weighting of these criteria. The City then incorporated this input into the final design of a written ranking system developed in conjunction with JEO Consulting Group and the Heartland Center for Leadership Development.

## **BACKGROUND INFORMATION**

Associated with the City of Lincoln's growth, the Department of Public Works and Utilities must set priorities and implement an appropriate stormwater Capital Improvement Program (CIP) each year. The City must determine which structures need to be upgraded, what the actual sources of flooding and complaint problems are, and if upgrading a system upstream has negative consequences downstream.

Historically, the City has used a priority list of the stormwater projects developed in 1966. That list was updated in 1979. These projects were prioritized mainly on the capacity (5-year storm for residential and 10-year storm for commercial and industrial areas) of the drainage system. Topographic and economic factors were also considered in the prioritization methodology. However, structural condition, numbers of complaints and other factors were not featured in the priority formula. Because the minimum design standards used by the City have been upgraded and significant zoning changes have been made since 1979, a new and more robust approach of developing CIP priorities was needed for the City of Lincoln.

The consulting team of JEO Consulting Group, Inc. and Wright Water engineering evaluated several municipal stormwater CIP prioritization programs throughout the

United States. The following broad approaches are typically used for CIP prioritization programs:

- Written scoring—city, county or district has a written and well-documented scoring system for ranking projects.
- Written policy—entity only has a written policy for prioritization of projects with no scoring system for benefits.
- Engineering judgment or committee review—projects are selected based on departmental engineering judgment or selected by varying priorities set by a city council.

Noting the advantages and disadvantages of each approach, which are summarized below, the City determined it would use a written scoring approach for future CIP programs.

<b>Approach</b>	<b>Advantages</b>	<b>Disadvantages</b>
Written Scoring	Reduces subjectivity Emphasizes stormwater program goals Provides numeric measures for meeting program goals Can be more equitable	Time and budget to calculate ranking Data collection is field intensive
Written Policy	Reduces subjectivity, although to lesser extent than written scoring approach Can emphasize program goals	May be difficult to distinguish between projects with similar priorities
Engineering Judgment or Committee Review	Ease of implementation	May be difficult to prioritize projects May not meet stormwater program goals Rankings may be subjective May not be equitable

## **PEER ENGINEER REVIEW PROCESS**

The City of Lincoln contracted with the Heartland Center for Leadership Development, an independent nonprofit organization, to serve as facilitator for a series of engineer peer review committee discussions regarding the criteria, weighting factors and format for a proposed prioritization methodology. The Heartland Center also facilitated interim work sessions between the City and JEO Consulting Group to design committee meetings, debrief and report on each meeting, consult on follow-up strategies and on the development of the prioritization ranking tool.

The peer review committee met on three separate occasions during May and June, 2004, and included the following participants:

### **ENGINEERING PEERS**

Bob Wolf—Olsson Associates  
Daryoush Razavian—Olsson Associates  
Don Kuhlman—MACTEC Engineering & Consulting  
Greg Wood—E & A Consulting Group, Inc.  
Jeff Wagner—Mainelli, Wagner & Associates  
John Cambridge—Hennigson, Durham and Richardson, Inc.  
Kris Hahn—Black & Veatch  
Lee Gustafson—ESP Engineering  
B. “Mike” Michaelson—The Schemmer Associates, Inc.  
Doug Holle—The Schemmer Associates, Inc.  
Selma Kessler—Kirkham Michael Consulting Engineers

### **PROJECT TEAM**

#### **JEO Consulting Group, Inc.**

Lalit Jha	Kevin Kruse
J.D. Johnson	Steve Parr
Jonathan Jones—Wright Water Engineering	

#### **City of Lincoln**

Devin Biesecker	Dave Rathjen
Ben Higgins	Ryan Axmann
Bill Nass	Steve Faust
Bruce Sweney	Ed Ubben—Lower Platte South Natural Resources District

## **Heartland Center for Leadership Development**

Dr. Vicki Luther

Milan Wall

Reggi Carlson

### **MEETING #1**

May 25, 2004 from 1:00—3:00 p.m. at the Lower Platte South NRD.

At the first peer review committee meeting, City staff member Devin Biesecker explained the charge of the committee, and the parameters within which discussion should be limited. The committee was instructed to focus their attention on primarily smaller pipe drainage systems rather than large open drainage systems.

Lalit Jha of JEO Consulting Group presented an overview of the urban sub-basin survey project that was underway, and articulated the objectives for CIP projects:

- Public Health and Welfare
- Minimize Property Losses
- Enhance the Floodplain
- Ensure Flood Drainage Systems
- Enhance the Environment
- Encourage Aesthetics

Jonathan Jones of Wright Water Engineering presented summary information regarding sample prioritization methodologies used in 26 communities in 16 states. The study showed that while flooding is considered the most important factor in prioritization methodologies, there are numerous other factors that are regularly considered.

The peer group was instructed to consider a list of factors compiled that could be used to prioritize CIP projects. It was noted that the factors were not in any ranking order, nor was it necessarily a comprehensive list. Eventually, through discussions with the peer review committee, the City would determine a “ranking order” and “weighting” system for these and potential other factors:

- Structure flooding (residence, business, critical facilities, etc.)
- Street flooding (types of street, location, depth and duration, etc.)
- Yard flooding
- Isolated ponding
- Condition of existing structures ( age, size, type, damages, etc.)

- Maintenance frequency
- Complaints
- Erosion
- Inadequacy of existing system
- Undeveloped upstream area
- Developed area
- Negative impact on downstream system
- City's responsibility
- Miscellaneous issues (aesthetics, political, water quality, etc.)

### **Possible weighing factors/multipliers**

- Risk/severity factor (loss of life, injury, etc.)
- Flood frequency factor

Following the presentations, the facilitators moderated an open discussion through which numerous comments and questions arose. The discussion was an effective tool for the City of Lincoln, the consulting team and the peer review committee to refine the nature, scope and intention of the project at hand. It was determined that the prioritization methodology designed as a result of this committee's work should be a flexible tool that could be used as a screening device for City staff. Intentionally, the cost of a project would be considered separately. The group was also informed that the City wished to develop a methodology that was dependent only upon information that is currently available, rather than one which would create the demand for additional information gathering.

### **MEETING #2**

June 8, 2004 from 1:00—3:00 p.m. at the Lower Platte South NRD.

Devin Biesecker reiterated that the purpose of the committee's work was to develop methodology to prioritize capital improvement projects for urban stormwater pipe systems, not large stream systems. Participants were seated at four separate table groups to facilitate individual and small group consideration of the various criteria factors introduced at the preceding meeting. Participants were given worksheets that listed 12 factors and were instructed to work individually to assign a point value to each factor, which would sum up to a total of 100 points. The higher the number of points would determine the higher priority. Participants could choose to assign 0 points to a criterion, and they could choose to write in additional criteria for consideration. After working as individuals, table groups were directed to discuss their scores, and then come to consensus on a table score for each criterion.

The groups' scores were tallied and are shown below:

	Group 1	Group 2	Group 3	Group 4	Total	
Structural Flooding		20	22	35	25	<b>102</b>
Street Flooding		10	11	20	10	<b>51</b>
Condition of Existing Drainage System		10	11	15	15	<b>51</b>
Inadequacy of Existing Drainage System		10	9	5	15	<b>39</b>
Maintenance Frequency		10	6	15	5	<b>36</b>
Links to Other Utility Improvements		10	4	0	15	<b>29</b>
Yard/Isolated Flooding		0	4	10	5	<b>19</b>
City Liability/Legal Issues		10	6	0	0	<b>16</b>
Negative Impacts Downstream		5	10	0	0	<b>15</b>
History of Complaints		5	4	0	5	<b>14</b>
Erosion		5	2	0	5	<b>12</b>
Undeveloped Upstream Area/Future Land Use		0	5	0	0	<b>5</b>
Community Development		5	0	0	0	<b>5</b>
Health & Safety		0	5	0	0	<b>5</b>
Developed Area		0	1	0	0	<b>1</b>

Following this exercise, a general report back discussion revealed that most participants thought that it would be appropriate to collapse the factors into a few broad categories, and to have other factors become weighting factors. The group also desired to have clear definitions regarding “high/low” priorities and “major/minor” flooding events.

Following the second peer review meeting, JEO Consulting Group developed a draft ranking sheet and definitions. (See attached “*Prioritization for Urban Drainage Improvements*”) These documents were sent to peer review committee members so that they could consider the format prior to their final meeting.

### **MEETING #3**

June 22, 2004 from 1:00—3:00 p.m. at the Lower Platte South NRD.

At the final meeting, the peer review committee was asked to study the draft ranking sheet and provide qualitative feedback by recording what they liked and did not like about the proposed ranking system, and what they would suggest as possible changes for improvement.

There was general consensus that the draft was a good first effort, and most participants were pleased that the format offered a degree of flexibility. However, the group warned that one portion of the ranking tool—Miscellaneous Factors—allowed for the addition of up to 150 points, which probably is too many, and could have a skewing effect on the ranking of projects. The group also offered other suggestions about how the format might be adjusted and improved.

After a general discussion, City staff member Ben Higgins explained that the City was collecting data on 17 sub-basins. Plus there will be dozens more in the future. The suggestions and comments from this committee would be integrated into a refined ranking system. The plan was to test the ranking system by the fall or 2004.

There will be other considerations when this tool is actually utilized, but its primary purpose is to be a screening tool. This is intended as an internal tool. There are no plans to appoint a special CIP committee that uses this tool to prioritize projects.

The tool will be used primarily by the Watershed Management Division, but streets, construction and other departments may also provide input and feedback during the prioritization process.

Once a revised version of the screening tool is available, the Peer Review Committee will be able to review it. When bond issue projects become approved, the Watershed Management Division will test this tool through a prioritization process, and that is when they will be looking closely at “special considerations,” such as the location of emergency facilities, schools or arterial roadways. JEO Consulting was asked to include examples of how these factors could be weighted when it submitted to the City its next draft of the ranking sheet.

As the meeting concluded, the peer review committee members were invited to offer additional comments and suggestions directly to City staff members.