PUBLIC REVIEW DRAFT

CHAPTER 4

Water and Environment

Fargo will create permanent flood protection and ensure the quality and supply of this precious resource through water conservation. We will celebrate water by embracing the Red River of the North and the Sheyenne River and integrating sustainable rainwater management techniques into the fabric of the city. We will protect out natural resources and preserve the health and beauty of our environment.

WATER AND ENVIRONMENT

Water is a vital resource for life on the northern plains, but it is also an unpredictable and fragile system. This plan emphasizes understanding water as a key to living in a mutually beneficial relationship with the environment and creating more resiliency in Fargo.

Fargo's location along the Red River of the North was no accident. The juncture of the river and multiple railroad lines made this a logical location for a city. If the wet cycle currently being experienced had been the case 125-150 years ago, this community may have never grown to the extent that it has. But, it wasn't the case, and the community has grown to a vibrant city of over 100,000 people – both because of and in spite of the Red River. The Red River has experienced major spring flooding during seven of the past 14 years, with two out of four of the highest recorded river levels occurring in the past three years (2009 and 2011).

Fargo's parks and open spaces are another significant environmental resource. Fargo's parks are managed by the Park District, which is a separate government agency from the City of Fargo. The Park District takes care of over 2,100 acres of park land, maintains 90 miles of recreation trail, operates 110 facilities, plants approximately 110,000 annual flowers, cares for thousands of trees located on park property, and offers over 850 programs and special events. The 110 facilities include five golf courses, three pools, the Pepsi Soccer Complex, Anderson Softball Complex, Tharaldson Baseball complex, the Southwest Youth Ice Arena, Courts Plus Fitness Center, the South Arena, the Coliseum and Lindenwood Campground. As Fargo grows, the City of Fargo, the Fargo School District, and the Fargo Parks District have an opportunity to enhance the environment and protect Fargo's natural resources.

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FROM MINDMIXER

Lets encourage our children to unplug from their Wii by turning some of our turfed school grounds into living laboratories for elementary education and exploration. - Cat

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Initiatives:

01: PERMANENT FLOOD PROTECTION
Develop internal flood protection systems to a river stage of 42.5 feet using permanent levees and flood walls and create long-term, 500 year flood protection through construction of a diversion channel.

02: WATERSHED MANAGEMENT
Develop a strategy for regional watershed flood management simultaneously with the diversion project.

03: DRINKING WATER QUALITY AND SUPPLY
Ensure safe drinking water quality and supply by studying water quality impacts of Devil's Lake overflow on the Sheyenne River, ensuring the health of the Red River, and preparing for long-term emergency water supplies in times of drought.

04: WATER CONSERVATION
Develop policies and programs to reduce water usage in the City of Fargo. For example, the City could expand its wastewater reclamation and reuse system for drinking, irrigation, and industrial users. The city could use native/xeric plants to reduce need for irrigation.

05: WASTE AND RECYCLING
Develop policies to reduce waste and increase recycling programs.

06: AIR QUALITY
Create strategies to ensure the quality and healthfulness of the air. Promote reduced emissions from transportation, energy production, industry, and all sectors of our city.

07: GREEN STORMWATER INFRASTRUCTURE
Incorporate natural stormwater management and flood control areas that provide recreational opportunities into the City. Examples include on-street rain gardens that soak up and clean stormwater runoff before it enters the storm sewers and retention areas.

08: PARKS, HABITAT, AND OPEN SPACE
Ensure all neighborhoods have access to safe and well-maintained neighborhood parks. Enhance parks with more trees and amenities. Protect open space habitat areas and create Nature Centers and living laboratories to educate residents about nature.

09: TREE CANOPY
Increase the amount of trees in Fargo by preserving trees in new development, planting trees in parks, and increasing the number of street trees along Fargo's main corridors.

10: LIGHT POLLUTION
Develop strategies to reduce light pollution and maintain the beauty of the night sky. Examples could include energy efficient full cut off light fixtures on city streets.

BEFORE: TYPICAL STORMWATER MANAGEMENT

This chapter focuses on the connections between the health of Fargo's natural environment and the quality of its parks and public spaces. The above photograph captures the typical stormwater infrastructure in Fargo.

AFTER: STORMWATER MANAGEMENT FOR ENVIRONMENTAL STEWARDSHIP AND COMMUNITY SPACES

This rendering reimagines the same infrastructure using green stormwater management techniques. The water in this example follows a curving pattern through native vegetation which slows the water and filters out pollutants. A trail system and interpretive signage transforms this area into a great community space.

INITIATIVE 01

PERMANENT FLOOD PROTECTION

RECOMMENDATIONS

- Support the Flood Diversion Authority and subcommittees.
  - Assist diversion authority to select a program management consultant to design the FM Metro Flood Diversion Project.
  - Collaborate with Legal Group/Finance Committee/Public Outreach Committee/Mitigation Committee.
- Ensure all City policies are consistent with the MF Metro Flood Diversion Project.

DESCRIPTION

Flooding in the Red River Valley has become increasingly severe and frequent. It threatens the viability and quality of life of the entire region. The flood of record occurred in 2009 with a crest of 40.82 feet. The potential damages to the Fargo-Moorhead area are estimated to average more than $194 million per year without permanent flood protection.

The City is using a three pronged approach to flood protection in Fargo. The first prong is to provide real protection, even if the city is not able to certify the protection. This involves building levees wherever needed to eliminate need for sandbagging, maintaining a strategy for emergency protection and requiring all new construction to elevate to meet the protection standards of the new 100 year floodplain. The strategy for emergency protection includes emergency clay levees, quick deploy methods, and sandbag operations.

The second stage of Fargo's flood protection strategy is to build certified protection. The city will build levees to a certified standard. If it is not feasible to achieve 100% certification, the City will compartmentalize

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FROM MINDMIXER

I believe it's vital to also protect our revitalized downtown that is ripe for more mixed use development. We can leverage this downtown flood protection as a catalyst for development and fun and it can serve as a way to recruit and retain people and businesses by making Fargo not only safe, but much more fun! - gofargo

FROM MINDMIXER

Officials should implement policies which build community resiliency - develop resources to better predict and understand flood events, move people out of harms way, and ensure future generations don't repeat past mistakes. – will

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to remove as many properties as practical from the floodplain.

The diversion is the third prong of Fargo's flood protection strategy. It will provide protection up to the 500 year flood event and will be combined with recreational opportunities. The goal of this strategy is to develop internal flood protection systems to a river stage of 42.5 feet using permanent levees, flood walls, and the diversion.

The shift to permanent flood protection has been necessitated by both the spring flood events and the resulting increase in the base flood elevation after several years of study by FEMA. Over 200 properties have been purchased by the City of Fargo since the previous record crest in 1997. Multiple policies, programs, and initiatives have resulted in a higher level of flood resiliency. Fargo's main flood protection efforts are focused on the authorization and appropriation of funds for a river diversion around the metropolitan area.

Fargo representatives are currently serving on the Flood Diversion Authority, which was formed by a joint powers agreement between Fargo, Moorhead, Cass County, Clay County, the Cass County Joint Water Resources District, and the Buffalo-Red River Water Resources District. The purpose of the Flood Diversion Authority is to build and operate a flood diversion channel along the Red River of the North to reduce the flood risk of the stakeholder communities and counties. The Flood Diversion Authority and its members worked with the United States Army Corps of Engineers on the FM Metro Flood Risk Management Feasibility Study to develop the flood diversion channel project.

BENEFITS

Flood protection protects property and saves money that would be spent on flood insurance. The City's internal plan to construct floodwalls and levees to 42.5 feet will provide near-term flood protection to near 100-year flood levels and will provide 500-year flood level protection when combined with the finished flood diversion project. In addition, these efforts will reduce the need for expensive flood risk insurance, which could cost city residents nearly $20 million per year without further protection measures.

The construction of these levees and the diversion will result in direct employment which will stimulate the local economy. Businesses will have the certainty to expand and invest in Fargo.

Flood protection has social benefits as well. Levees and the diversion can be combined with trails and recreation projects. Protection from spring flooding will give Fargo residents greater peace of mind.

A three-year study led by the Corps of Engineers, and also involving local engineering firms, looked at many options; including levees, floodwalls, retention, and other options and found the current diversion plan is the only concept that would significantly reduce flood risk in the Fargo-Moorhead area from flood events larger than the flood of 2009.

CASE STUDIES

Magdeburg Water Bridge, Germany

The Magdeburg Water Bridge is a navigable aqueduct in Germany, opened in October 2003. It connects the Elbe-Havel Canal to the Mittellandkanal, crossing over the Elbe River. Similar structures would be built for the Fargo-Moorhead area diversion project.

Source: http://en.wikipedia.org/wiki/Magdeburg_Water_Bridge

Original uploader was WhiteDragon (http://en.wikipedia.org/wiki/User:WhiteDragon)at en.wikipedia

Red River Floodway Expansion Project

The Red River Floodway protects Manitobans from the same river which runs through the Fargo-Moorhead area, and shares similarities with the proposed Fargo Moorhead area diversion itself. The expansion of the Red River Floodway will increase flood security and improve the quality of life for many Manitobans. In addition to improving flood protection and preparedness, the project will also create thousands of direct and indirect jobs, protect the environment and give residents an opportunity to help shape the future of their communities.

Source: http://www.floodwayauthority.mb.ca/home.html

Original uploader was JPark99 at en.wikipedia.org

INITIATIVE 02

WATERSHED MANAGEMENT

RECOMMENDATIONS

- Develop watershed management practices that reduce sediments, nitrogen, and phosphorus from being washed into the rivers.
- Increase public awareness about ways to improve the water quality in the rivers.
- Update and enforce City stormwater management programs and ordinances.

DESCRIPTION

The Fargo/Moorhead Metro area flood diversion project currently passing from feasibility phase to design phase will provide permanent flood protection for the City. The diversion project will help alleviate the flooding conditions but will not address other watershed management issues such as water quality of the rivers and streams within the watershed.

Good water quality is essential to the viability of the water ecosystem. Pollutants, sediments, and erosion affect the water ecosystem negatively. Sources of pollutants in urban areas include fertilizers, household cleaning products, highway de-icing agents, grass clipping and leaves, sediments from impervious surfaces, and construction projects that easily find their way into the region's rivers and streams. Urban areas have a higher percentage of impervious areas (streets, sidewalks, roofs and driveways) and the increased percentage of impervious surfaces creates water quality challenges due to the quantity and quality of runoff to the river and the rate at which the runoff occurs. Pervious surfaces, such as lawns and gravel, allow for water to infiltrate into the ground resulting in a much lower rate of overland flow.

FROM MINDMIXER

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Officials should implement policies which build community resiliency - develop resources to better predict and understand flood events, move people out of harms way, and ensure future generations don't repeat past mistakes." – will

The City has a system of stormwater inlets and piping throughout the city that discharges directly to the river. The runoff contains higher concentrations of contaminates, sediments, and has a higher water temperature, all of which can have a negative effect on the natural river habitat. In the rural growth areas, sources of pollutants include fertilizers, septic system runoff, and sediment and have similar detrimental impacts on Fargo's waterways.

The City developed and implemented a watershed management ordinance to address water quality and runoff. The City also has stormwater management protocols to address erosion and sediment control for construction projects. These measures are important steps toward improving water quality and should be closely monitored and augmented.

BENEFITS

Development of watershed management practices will provide another way in which the City can decrease runoff to the river and maintain favorable water quality. Managing runoff will help the City protect the river from contaminants, decrease sediments, reduce lawn fertilizers, clipping and leaves, and improve habitat for aquatic species and the quality of recreational riverfront venues. The established Best Management Practices (BMP) provided by the Environmental Protection Agency (EPA) and other watershed management resources can be adopted by the City to help reduce the effects of unmanaged stormwater runoff.

The diversion project looks to reduce the water levels through the City during flooding events whereas the watershed management plan will also include ways to decrease erosion of the river banks and maintain water quality. The City already has some stormwater management tools in place including erosion and sediment control measures for construction projects. There are also several retention basins throughout the City to aid in reducing flow to the river during rain events as well and allowing some pollutant and sediments to be retained in the basin and not discharged to the river. The City should continue this progress and work with other agencies to help educate residents about ways they can help in reducing the negative effects urban and rural areas can have on the river.

CASE STUDIES

Stormwater Best Management Practices Manual

The Minnesota Pollution Control Agency provides a manual to protect water quality in urban areas by providing information on preventing storm water-related pollution.

Source: http://www.pca.state.mn.us/index.php/water/water-types-and-programs/stormwater/stormwater-management/stormwater-best-management-practices-manual.html

Stormwater Best Management Practices

The National Pollutant Discharge Elimination System (NPDES) provides several tools for public education, construction practices, and examples of stormwater case studies conducted throughout the United States.

Source: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/

Stormwater Treatment: Assessment and Maintenance

The University of Minnesota provides a manual outlining the methodology for the assessment and maintenance of storm water treatment. They provide guidelines on sampling, monitoring, analysis, and recommendations.

Source: http://stormwaterbook.safl.umn.edu/

City of Fargo Ordinance

The City of Fargo Ordinance Chapter 37 addresses stormwater management.

Source: http://www.ci.fargo.nd.us/CityInfo/Departments/Auditor/Ordinances/

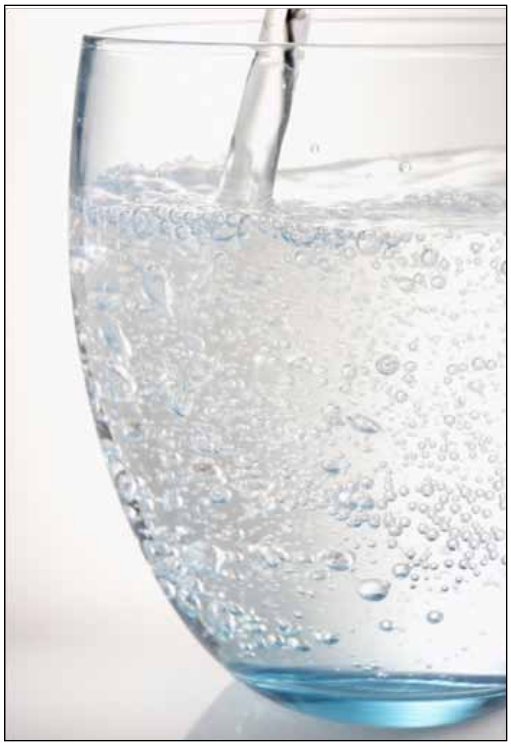
City of Fargo Guide to Erosion and Sediment Control Practices

The City of Fargo provides a guide to erosion and sediment control practices. The guide is used for construction projects and provides some best management practices and pollution prevention.

Source: http://www.cityoffargo.com/attachments/7dfe27fd-67fd-4173-8440-76e0c0433e3a/2007%20guide.pdf

INITIATIVE 03

DRINKING WATER QUALITY AND SUPPLY



RECOMMENDATIONS

- Pursue new treatment technologies and operational strategies to prepare for future challenges and to ensure the drinking water of upmost quality is delivered.
- Monitor drinking water quality and supply.
- Continue to comply with U.S. Environmental Protection Agency, World Health Organization, and North Dakota Department of Health Regulations.

DESCRIPTION

Fargo will ensure drinking water quality and supply by studying the impacts of Devil's Lake overflow on the Sheyenne River, ensuring the health of the Red River, and preparing for long-term emergency water supplies in times of drought. Other municipalities and the Cass Rural Water District also rely on the City of Fargo for drinking water.

Since 1912, the City of Fargo, North Dakota has operated a water treatment plant (WTP) utilizing source water from the Red River. Past droughts prompted the City to pursue the Sheyenne River and Lake Ashtabula as additional water supplies.

Since 1993, the region has been in a wet-cycle that has elevated Devil's Lake to record levels, which has resulted in major flooding. In 2004, to reduce flooding in the Devils Lake Basin, the State constructed an emergency outlet to allow controlled releases of water from the lake into the Sheyenne River. Due to the shallow nature, elevated natural discharge, surrounding soil conditions, and minimal outflow, Devil's Lake exhibits poor water quality that poses treatment problems.

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FROM MINDMIXER

The pressing issue is supply, especially with the demand projections 20-50 years down the road. The metropolitan area will be in quite a pickle if there's ever another bad drought... -fmmetroplex

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While currently in a wet-cycle, the region has a history of severe drought. The use of multiple water sources is Fargo's first line of defense against drought conditions. To mitigate potential impacts from a severe drought in the future, Fargo is committed to the Red River Valley Water Supply Project, to provide in long-term emergency water supply for the entire region.

Given the drought and treatment challenges to Fargo's water supplies, Fargo has made a commitment to its water consumers to continue to provide water of the upmost quality by implementing proactive treatment technologies and operations.

BENEFITS

Drinking water quality and supply directly affect the health of a region. In addition to meeting all primary drinking water regulatory requirements, Fargo has established some specific treatment goals that include meeting all the secondary drinking water standards (with the exception of pH). By establishing these goals and provided the means to achieve them, the City of Fargo is ensuring that drinking water quality is maintained in the future to protect the health of all of Fargo's water consumers.

CASE STUDY

Fargo Water Treatment Plant Facility Plan, Fargo ND

The Facility Plan for the City of Fargo will be finalized in 2012 and will include long term water quality and supply projections along with treatment objectives and recommendations to meet the current and future treatment and supply goals for the area. The recommendations provided form the Facility Plan will ensure Fargo is prepared for water quality impacts associated with Devils Lake, prepared for future regulations, and position Fargo for drought mitigation strategies.

INITIATIVE 04

WATER CONSERVATION

RECOMMENDATIONS

- Craft a Water Efficiency Plan (refer to: http://www.epa.gov/watersense/pubs/community.html).
- Improve and tighten the distribution system to maximize efficiency
- Provide information about, and access to, water efficient appliances and fixtures utilizing the resources of the EPA WaterSense program.
- Provide education and investigate incentives for using landscaping which requires minimal water.
- Explore additional wastewater reclamation and reuse systems for drinking, irrigation, and industrial use.
- Educate Consumers about water conservation.
- Optimize lawn watering schedules to reduce water loss due to evaporation and runoff.
- Evaluate water utility rate increases that discourage excessive use and promote water conservation.
- Set a good example by using water efficient equipment in City facilities.

DESCRIPTION

Water conservation is likely to emerge as the defining issue of the next century. Whether dealing with excess water in flood events or the challenges of drought, Fargo as a community is well versed in the importance of stewarding water resources. But water conservation also goes hand in hand with energy conservation. Cleaning water to drinking quality, pumping it to your home, and treating wastewater requires vast amounts of energy. If Fargo can capitalize on its understanding of water issues and focus on improving water conservation efforts, the community could emerge as a national leader in the field. Not only could this knowledge be utilized as a regional resource, but it should also be carefully considered for its money saving potential.

There are opportunities for Water Conservation at every step of the

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FROM MINDMIXER

The encouraged use of rain barrels and xeric landscaping could be very beneficial. - Christina H

FROM MINDMIXER

Captured rain can be used to water gardens, plants, lawns, and even wash cars. And it helps keep the river clean. - producertroy

”

water collection process.

Fargo is already doing a lot of things right. Over the last 30 years, the average amount of water used per person in the Fargo area has decreased approximately 20 percent. This decrease in water usage is attributed to the current regional wet-cycle, water utility rate increases, and consumer education and awareness related to outdoor water use and general water conservation practices.

The average U.S. household could save more than 11,000 gallons of water, and about $170 on its water bill, every year by making a few simple changes such as installing WaterSense labeled toilets and faucets in the bathroom. By conserving water, the demand on the water source and distribution system is also reduced, therefore extending the life of the water treatment facility and distribution system.

In order to promote water conservation the City of Fargo has used native and xeric plants to reduce the need for landscape irrigation. To promote additional water conservation the City could also expand its wastewater reclamation and reuse system for drinking, irrigation, and industrial users. Some of the steps individual households and water users can take to assist with water conservation include fixing leaking fixtures, using more efficient shower heads, dual flush toilets, optimizing the yard watering schedule, and using native plants in landscaping which require less or no additional watering.

BENEFITS

The water supply to the City of Fargo is susceptible to times of drought, therefore, water conservation efforts are key to maintaining the available water supply. Conserving the City's available water also protects the water resource, minimizes water pollution and health risks, reduces the need for costly water supply and new water and wastewater treatment facilities, and saves energy used to pump and treat water.

The benefits of water conservation also apply to the individual users by reducing the costs of water used, saving energy on heating water, warding off water rate increases due to costly treatment facility expansions, and maintaining the health of the aquatic environment.

CASE STUDY

Greywater Reuse as Industrial Water Supply

Fargo, ND

Fargo provides treated wastewater effluent from its Wastewater Treatment Plan as a water supply to an industrial ethanol plant. This solution allowed the ethanol plan to meet its water requirements without exceeding the capacity of the region's water systems. On average the Wastewater Treatment Plant treats 12,000,000 gallons of wastewater per day to meet the EPA Clean Water Act Standards. The water supply requirements for the ethanol plant range from 790,000 gallons per day in the winter to 1,400,000 gallons per day in the summer.

Energy

The water process: Source and conveyance (Use Low Impact Development)-> Drinking Water Treatment (Recycle and Reuse Wastewater) -> Distribution (Fix leaking pipes) -> End use (promote and expand EPA's WaterSense program) ->Wastewater Treatment

Source: NRDC

The average household could save more than 11,000 gallons of water, and about $170 on its water bill, every year by making a few simple changes such as installing WaterSense labeled toilets and faucets in the bathroom.

Source: http://www.epa.gov/watersense/

Letting your faucet run for five minutes uses about as much energy as letting a 60-watt light bulb run for 14 hours.
http://www.epa.gov/watersense/our_water/why_water_efficiency.html

The average American family of four uses roughly 400 gallons of water per day at home.
How to save water as a community: http://www.epa.gov/watersense/pubs/community.html

Delivering water and wastewater services is also an energy-intensive effort, as the water is treated, pumped to our homes and businesses, then pumped to wastewater facilities to be treated again. EPA estimates 3-4 percent of national electricity consumption, equivalent to approximately 56 billion kilowatts (kW), or $4 billion, is used in providing drinking water and wastewater services each year. Water and wastewater utilities are typically the largest consumers of energy in municipalities, often accounting for 30-40 percent of total energy consumed. Pursuing energy efficiency at our water sector systems can significantly reduce operating costs, while mitigating the effects of climate change.

http://water.epa.gov/infrastructure/sustain/waterefficiency.cfm

CASE STUDIES

EPA Cases in Water Conservation

The EPA compiled a number of water conservation case studies in 2002 involving multiple states and water use areas. The case studies outline the problem associated with each area, the approach taken to mitigate the water conservation issue, and the results obtains from the implemented approach.

Source: http://www.epa.gov/WaterSense/docs/utilityconservation_508.pdf

U.S. Department of Energy, Federal Energy Management Program (FEMP)

The Federal Energy Management Program requires agencies to implement water efficiency efforts. FEMP's mission is to assist agencies in water efficiency and meeting Federal mandates.

Source: http://www1.eere.energy.gov/femp/program/waterefficiency.html

City of Fargo, Fargo North Dakota

The City of Fargo has provided a list of tips for water conservation on the City's website. The list includes tips for both indoor and outdoor water conservation practices as well as a plan to respond to drought conditions that may impact the City.

Source: http://www.cityoffargo.com/CityInfo/Departments/WaterTreatment/ConservingWaterIndoors/

INITIATIVE 05

WASTE AND RECYCLING

RECOMMENDATIONS

- Monitor recycling rates to determine where to target increased awareness and expansion of existing programs
- Partner with local organizations, neighborhood associations, and property managers to increase awareness and recycling and compost efforts in apartments and low rate areas
- Evaluate and restructure solid waste processing fees to encourage full citizen participation in the curbside recycling program.
- Invest in infrastructure to accommodate recycling of additional materials, larger bin size, weekly curbside recycling service and expanded composting programs.
- Reduce waste in the building industry.

DESCRIPTION

Fargo is nationally recognized for its efforts to protect the environment, and it has made great strides to reduce the municipal solid waste stream. Fargo will continue its progress by striving to further reduce the amount of solid waste reaching the landfill through increased recycling efforts. The city currently provides curbside recycling to 22,000 residential households who pay for residential garbage collection, and 27 drop-off sites are available for those who cannot get curbside. Back yard composting bins and drop off sites encourage the composting of yard waste. On-site energy production through methane, solar and wind production provide the energy for landfill facilities. The cost savings and sale of excess energy to a local power cooperative is projected to generate $370,000 in revenue for the city.

Fargo will monitor and evaluate current recycling efforts to identify opportunities to enhance programs. Collaboration with community organizations and property managers will increase citizen awareness and participation in existing programs and provide revenue for expanded

FROM MINDMIXER

“...something needs to be done to make it easier for apartment dwellers to recycle.” – Jen K

FROM MINDMIXER

Fargo should collect food scraps for composting. Many progressive cities around the country are hopping on board with this endeavor. Why should food scraps go into the landfill where they take forever to decompose. Let’s close the circle.”- Goldie

programs. Particular focus on apartments and multi-family housing units as well as in low-rate areas can significantly enhance the city's overall recycling rate. The city will evaluate and restructure the existing variable rate system to provide stronger incentives that encourage citizen recycling efforts, and will invest in infrastructure that will equip the expansion of future programs.

FROM MINDMIXER

"There is too much disposal of construction waste and material handling supplies such as pallets. It all should be recycled. Other cities grind it and use for landscaping wood chips Plastic/paper/can recycling is great but we should be way beyond that concept of the last century." – RedWayne

BENEFITS

The accommodation of additional materials including 3-7 plastics and non-corrugated cardboard drastically reduces the volume of waste that enters landfills. Single-stream recycling programs provide convenient opportunities for citizens to use recycling, since no separation is required. Education programs targeted at low-rate areas can identify and help overcome barriers to citizen participation in recycling programs. No-cost recycling programs combined with pay-as-you-throw garbage collection rates provide strong incentives and fair distribution of the costs for the processing of solid waste. Decreased solid waste input in the Fargo landfill will delay the closure of the existing site as well social, economic and environmental impacts associated with siting additional landfills. Investment in infrastructure to support recycling efforts can provide economic benefit to the community. The 2001 EPA Recycling Economic Information Study showed that the recycling industry provides more economic benefit than waste management because it adds value to materials. Municipal recycling and reuse programs spurs private sector investment in recycling manufacturing investment and encourages economic growth.

CASE STUDY

Zero Waste Implementation Plan for the County of Hawai'i, HI (2009)

As an island county, Hawai'i county is especially aware of the impact of waste. Waste is often hauled far distances across the ocean at great cost. This is a plan for implementing recycling, composting, and reuse of materials to benefit the agritourism and construction industries and create jobs.

Source: http://hawaiizerowaste.org/

INITIATIVE 06

AIR QUALITY

RECOMMENDATIONS

- Complete emissions inventory of City operations and community wide emissions and establish reduction targets.
- Promote walkable, mixed use developments to reduce driving.
- Promote transit, cycling, and other alternative forms of transportation
- Encourage consumers to buy local goods to reduce transportation related pollution.
- Promote high efficiency buildings and infrastructure.

DESCRIPTION

Air pollution is both a local and global problem. In urbanized areas, impurities in the air from automobiles and industry are responsible for an increase in rates of respiratory diseases, particularly among children. Indoor air quality is also a significant health risk. The City of Fargo currently provides consultation and resources targeting indoor air quality. Services address mold, lead, radon, asbestos and carbon monoxide. Fargo will explore strategies to ensure healthy indoor and outdoor air quality.

Globally, greenhouse gases are impacting our planet, and global climate change is jeopardizing the potential quality of life of future generations. Fargo will be a leader in creating strategies to ensure the quality and healthfulness of the air. Fargo will promote reduced emissions from transportation, energy production, industry, and all sectors of the city.

BENEFITS

Reducing air pollution improves the health of local residents, improves the local environment, saves energy, and decreases greenhouse gas emissions and climate change. Air quality initiatives support the development of bicycle and public transportation infrastructure and provides a healthy environment for increased physical activity.

FROM MINDMIXER

If you truly want to get serious about it, adapt the same emissions standards [as] the rest of the Pacific Northwest. – fmmetroplex

FROM MINDMIXER

Prohibit smoking in city parks. Recently I was with my nephew at one of the local city parks and was appalled to see cigarette butts scattered all over the area where children were playing.
-- fmmetroplex

CASE STUDY

City of Eugene Inventory of Greenhouse Gas Emissions from Internal Operations and community-wide activities 2000 and 2005

Eugene, OR (2009)

Eugene tracked and compared greenhouse gas emissions in 2000 and 2005 for internal operations. In 2005 Eugene also began tracking community-wide emissions.

INITIATIVE 07

GREEN STORMWATER INFRASTRUCTURE

RECOMMENDATIONS

- Prioritize natural stormwater management and flood control techniques over traditional underground grey (pipe into the river) wherever possible and appropriate.
- Monitor and meter implemented green infrastructure projects to determine which design types and plant species are the most effective and resilient in Fargo's soil and climate.
- Integrate green stormwater projects into open space, streetscape, and neighborhoods in a way that improves appearance and functionality.

DESCRIPTION

Across the country communities are awakening to the importance and value of rethinking how stormwater should be handled. While the common practice over the last 60 years was to directly pipe runoff from streets, lawns, and parking lots directly into the river, more recently a deeper look at the impacts of that practice and a growing body of good pilot project examples has given way to a shift toward solutions that naturally clean stormwater while potentially increasing recreational opportunities and beautifying a neighborhood. In Fargo, bio swales (a linear depression in the ground with specific plant species chosen to help infiltrate water) could prevent pollution from entering the Red River, add a green/natural amenity, and in the winter could become part of a cross country skiing trail network.

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FROM MINDMIXER

(I would like) Rain Gardens in the boulevards to stop dirty water from entering the Red.

- Goldie

FROM MINDMIXER

Love it. Clean the environment AND beautify Fargo

- Drew FM

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Moving stormwater in Fargo is particularly challenging because of the lack of change in elevation and the current stormwater system is extensive with over 350 miles of pipe. This system is not connected to a treatment facility, so whatever washes down the storm drain goes untreated into the Red River. Natural stormwater management will improve the appearance of the community, improve stormwater runoff quality, and simultaneously decrease the amount of water that overwhelms the current system in large storms. Examples of these techniques include neighborhood scale rain gardens, swales, and retention areas planted with species that handle water and road runoff well. All of these examples use natural plants and landscaping to infiltrate water into the soil or slow down stormwater runoff.

BENEFITS

The benefits of natural or green stormwater infrastructure improvements are twofold: While not maintenance free, natural systems require more regular and less invasive maintenance that is often far cheaper than upgrading existing traditional stormwater systems. Additionally, natural systems improve water quality by filtering out the harmful pollutants from streets, parking lots, and other impervious areas before they make their way into groundwater or the Red River. Cleaner water means rivers that are better for recreation and improved habitat for Fargo's diverse species.

CASE STUDY

Stormwater: From KC to the Sea, Kansas City MO

The City of Kansas City, MO is planning to improve their Swope Campus (comprised of the Parks and Recreation Headquarters and the Water Services Department) as an education lab for Best Management Practices (BMPs). In addition to the transformation of the campus into series of outdoor learning labs, the Departments had the vision to integrate the campus with an elementary school curriculum that meets state educational requirements and showcases how each member of society has a role in protecting the health of the watershed and enhancing the quality of life for those living downstream.

Source: http://issuu.com/bnim/docs/100416_draft

The Fargo Project, Fargo ND

The City of Fargo is currently working on a pilot project to transform a neighborhood drainage basin into a community commons that will reflect the internal life and cultural vibrancy of the Fargo community. Meanwhile, the basin will maintain its function as a storm water collection site. The “Fargo Project” is made possible thanks to a partnership with ecological artist Jackie Brookner and by a $100,000 National Endowment for the Arts (NEA) grant. This grant will be matched by the City of Fargo.

Source: http://www.cityoffargo.com/CityInfo/Departments/PlanningandDevelopment/TheFargoProjectNEAOurTown/

CASE STUDY

Northern Kentucky Sanitation District 1

SD1 is responsible for the collection and treatment of Northern Kentucky's wastewater, as well as regional storm water management. SD1 is the second largest public sewer utility in Kentucky with a service area that covers approximately 220 square miles, encompassing more than 30 municipalities and unincorporated portions of Boone, Campbell and Kenton counties.

For years, SD1 has partnered with other utilities and the United States Conference of Mayors to advocate for a more comprehensive storm and sewer water approach that is based on regional improvements and local data. Their progressive and proactive approach has become a national model for how to integrate natural system stormwater improvements and regional solutions for flooding and water quality issues. In particular their Public Service Park demonstrates a wide variety of natural stormwater techniques and provides education about how they work and why they are important.

Source: http://www.sd1.org/default.aspx

INITIATIVE 08

PARKS, HABITAT, AND OPEN SPACE

RECOMMENDATIONS

- Ensure that all neighborhoods have walkable access to safe and well-maintained neighborhood parks.
- Enhance parks with more trees, habitat areas, and visitor amenities.
- Protect open space habitat areas and create nature centers and living laboratories to educate residents about nature.
- Consider the regional openspace network as an important amenity with recreational, natural habitat, and flood prevention capabilities.

DESCRIPTION

Without question, Fargo's robust park network is a valuable amenity for residents. Throughout the planning process, the community demonstrated unwavering support for parks and recreation, a strong interest in building on this asset, and a recognition that natural areas should be included in Fargo's long-term open space strategy. Fargo residents greatly value both programmed and unprogrammed open spaces and also realize that the Red River represents a challenge but also an important natural amenity.

This initiative focuses on improving park space by adding more trees and amenities and improving access to parks. Improved access to parks can include pedestrian connections between residential areas and park and creating more neighborhood scale parks distributed throughout the city.

Currently, the Park District takes care of over 2,100 acres of park land, maintains 90 miles of recreation trail, operates 110 facilities, plants approximately 110,000 annual flowers, and cares for thousands of trees located on park property. The 110 facilities include five golf courses, three pools, the Pepsi Soccer Complex, Anderson Softball Complex,

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FROM MINDMIXER

"All the property along the river that was bought out to the south of town: Plant thousands of trees and make a nature area for hiking and picnicking, and put in a fishing pier." – Charlie M

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Tharaldson Baseball complex, the Southwest Youth Ice Arena, Courts Plus Fitness Center, the South Arena, the Coliseum and Lindenwood Campground.

The Park District is an autonomous political body who has powers extended by the state legislatures, including the power to levy property taxes. The Park District offers approximately 61 free admission special events each year, hosts 60 art classes and approximately 730 sessions of recreational leagues and lessons. Over 215,000 people participated in at least one Park District program or event in 2010.

BENEFITS

The benefits of enhanced open space are well documented. Easy neighborhood access to parks increases healthy activity, encourages heavier park use, and fosters a sense of community amongst visitors. Ensuring neighborhood parks are fully programmed, and of a high quality, promotes regular use. Integrating natural habitat areas into parks helps to bring nature into the community and provides interpretive learning opportunities and places for unprogrammed exploration. Finally, thinking about the region's open spaces as an integrated system provides benefits that dramatically improve the potential of the network to boost recreational and ecological performance.

FROM MINDMIXER

It's a darn shame that the area closest to the river in downtown Fargo is a city parking lot. Convert that area into an underground parking ramp and put a lush, beautiful public plaza/park in that spot. Think of quality on par with Central Park in New York. You can have the road go under the park as well to connect up with the underground parking ramp and also allow a full street connection for 2nd Ave N to connect up with 2nd, 3rd and 4th St. N. -- fmmetroplex

CASE STUDY

The Natural Areas Program

Denver CO

The Natural Areas Program's mission is to establish and maintain sustainable and healthy ecosystems including natural areas, mountain parks and waterways, generate well-informed and satisfied residents, and construct broad collaborations that make it all happen.

Unlike traditional developed parks, the natural area sites are guided, developed, and sustained more by natural processes and not by mans' horticultural activities.

The Natural Areas Program is a component of Denver Parks and Recreation Natural Resources Division and manages over 3,000 acres of natural open space within Denver's urban boundaries.

Source: http://www.denvergov.org/parksandrecreation/Parks/NaturalAreas/tabid/431064/Default.aspx

CASE STUDY

Buffalo Bayou Promenade

Houston, Tx

Buffalo Bayou Promenade is a public park in Houston, TX that follows the Buffalo Bayou, the main river through downtown Houston. The park connects neighborhoods with downtown, creating a viable active transportation connection and providing much needed recreation space for downtown residents and office workers. The City of Houston transformed this neglected patch of River by creating trails, regrading slopes to allow views into the park from surrounding development, and an art-driven lighting of dark corners.

Source: http://www.asla.org/2009awards/104.html

INITIATIVE 09

TREE CANOPY

RECOMMENDATIONS

- Strengthen and enforce landscaping requirements.
- Plant trees in city parks, along streets, and in parking lots.
- Explore creative programs to provide low cost trees to governments, organizations, and individuals.
- Raise awareness about benefits of trees.

DESCRIPTION

Fargo is known for its beautiful canopy of towering Elm trees. The image of green leafy branches doming over the road is a Fargo icon. Fargo's established parks, such as Island Park, have a rich tree canopy and provide an oasis from the urban environment. However, due to the rapid expansion of south Fargo, trees in newer developments have not had the opportunity to mature and develop the same lush tree canopies as older parts of town. It will take time to establish a tree canopy over new areas of town, but now is the time to start planning for trees and bringing of a robust tree canopy to all areas in Fargo.

Fargo will increase the quantity of trees by preserving trees in developed parts of town, planting trees in parks, increasing the number of street trees along Fargo's main corridors, and ensuring new development includes plentiful trees and other landscaping. Bolster landscaping requirements within parking lots is another strategy to bring more trees to newer areas of town.

BENEFITS

Trees benefit the public by improving the appearance of the community. Trees make it more desirable to walk because they protect pedestrians against the sun and weather and provide separation between sidewalks and the street. Trees also have an environmental benefit; they reduce stormwater runoff and the resulting water pollution, and they clean the air. Trees have an economic impact too. According to Dan Burden's 22

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FROM MINDMIXER

Line Roads with Trees - Trees prevent glare ice, provide a wind break during blizzards, and make summers more bearable. The city of Fargo should take the lead in creating tree lines on highways and major roads. -- Drew FM

FROM MINDMIXER

More Trees! - Everywhere I turn in the city, when driving through new developments, it shocks me at the utter lack of vegetation and trees.
-- fmmetroplex

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benefits of urban street trees, for the price of $250-600 per tree (including first 3 years of maintenance) a tree can return over $90,000 in direct benefits. These benefits result from the fact that people spend 20% more money in stores that have trees in front of them, and trees increase property values of homes and businesses. The shade from tree also increases the lifespan of asphalt and other paving materials.

> FROM MINDMIXER
> **And require trees in parking lots!** – Durdon

CASE STUDY

Tree-mendous Maryland Program

A program at Maryland Department of Natural Resources provides low-cost trees to organizations for planting on public lands and community open spaces. The program provides a list of available trees and shrubs and free delivery of trees for community orders of 10 or more trees. Using the Community Reforestation Program, development projects in Baltimore County pay for required reforestation, developers are also permitted to pay a fee in-lieu of mitigation for required reforestation. These fees are used to reforest open lands.

INITIATIVE 10

LIGHT POLLUTION

RECOMMENDATIONS

- Continue the recent utilization of full-cutoff, LED streetlight fixtures.
- Promote minimal up-lighting of building facades.

DESCRIPTION

Light pollution is excessive and ineffective light that hinders views of the night sky. Negative effects of light pollution include disruption of ecosystems and animal behavior, such as migration, energy waste, and disruption of human circadian rhythms. As a community, having access to nature and protecting views of the night sky and of the aura borealis are important values. As Fargo continues to grow, light pollution will be an emerging issue. New innovations in street lighting can control light pollution when retrofitted into neighborhoods or employed in new developments. For example, full cut-off light fixtures reduce the amount of light that is directed at the sky without reducing visibility at the street level. New lighting technologies, such as LED can improve light quality, direct light with more precision, and reduce energy demand of streetlights. These new lighting fixtures can improve the aesthetic appearance of Fargo and strike a balance between security and light pollution. Fargo will decrease light pollution and increase energy efficiency by exploring LED lighting in full cutoff fixtures.

BENEFITS

Installing full-cutoff, LED streetlights not only reduces light pollution, but increases energy efficiency and improves the aesthetic appearance of Fargo.

CASE STUDY

Los Angles, CA

The City of Los Angeles is currently involved in a $57 million capital program that will span from 2009-2013. The program focuses on replacing cobrahead fixtures on residential streets with full cutoff, Dark Sky Friendly LED fixtures. Streetlights consume approximately 29% of the City's total operating budget, and the program is projected to save 35 million in energy savings and 13 million in maintenance savings from 2009.

image source: http://commons.wikimedia.org/wiki/File:LosAngeles06.jpg

LED Street Light Research Project, Remaking Cities Institute, Pittsburgh, PA

The City of Pittsburgh intends to replace its entire inventory of 40,000 streetlights with LED fixtures over the next 5-10 years. The finished project is expected to save annually an estimated $1.7 million in energy in maintenance costs per year.

http://www.cmu.edu/rci/projects/current-projects/Pittsburgh-LED.html

Energy

The City of Fargo Street Lighting Department currently has about 11,275 street lights in operation. All of the existing residential street lighting in the City is provided by 100W or 150W High Pressure Sodium (HPS) decorative fixtures. The existing business and commercial areas have 250W or 400W HPS decorative, cobra head and tilt head fixtures. With the advancements in technology and the costs of these new products continuing to drop, the City will continue to move in the direction of Solid State Lighting Systems saving the City between 35% and 50% in energy and maintenance costs.

60% Streetlights can account for as much as sixty percent of a municipal government's total electricity use.

Source: http://www.cmu.edu/rci/projects/current-projects/Pittsburgh-LED.html

70% LED streetlights saved the City of Greensburg, Kansas seventy percent in energy and maintenance compared to the traditional lamps they replaced.

http://www.betaled.com/us-en/LEDApplications/street-lighting/City-of-Greensburg-Kansas.aspx

GO 2030

Water and Environment