NOTICE OF REGULAR MEETING AND
COMMISSION STRATEGIC PLANNING SESSION

PLEASE TAKE NOTICE that there will be a regular meeting of the commission of the Madison Metropolitan Sewerage District at 8 a.m. until 12 p.m., on Thursday, March 14, 2019, at the Maintenance Facility – Training Room at 1610 Moorland Road, Madison, Wis. 53713. The commission will consider, and may take action, on the matters set forth on the attached agenda. If any matter on the agenda is to be considered in closed session of the commission, please be advised that following the closed session the commission will reconvene into open session for purposes of taking any action based on the closed session and concluding its agenda.

Date: March 12, 2019

D. Michael Mucha, P.E.
Chief Engineer and Director

Any person who has a qualifying disability as defined by the Americans with Disabilities Act that requires the meeting or materials at the meeting to be in an accessible location or format must contact the chief engineer and director at 608-222-1201, 1610 Moorland Road, Madison, Wis., at least 24 hours prior to the commencement of the meeting so that any necessary arrangements can be made to accommodate each request.

1. Opening
   A. Call to Order
   B. Welcome Guests
   C. Announcements

2. Appearances by the Public

3. Election for the Commission Secretary Position and Appointment of a Commissioner to the CED Performance Review Subcommittee – Mucha
   Commission Agenda Report

4. Consent Calendar
   A. Approval Meeting Minutes from 2-28-2019
   B. Approval of Cash Statement – Operating Fund
   C. Approval of Cash Statement – Capital Projects Fund
   D. Expedited Boundary Annexation 2019-04 LB Lands Parcel (City of Verona) – Sauser
      Commission Agenda Report
      Attachment 1: Resolution 2019-03-14-R1
Attachment 2: Map
Attachment 3: Legal Description
Web Link: LB Lands Order of Annexation and All Exhibits

E. Review and Approval of Sewer Extension Plans – Sauser
Commission Agenda Report
Attachment 1: Sewer Extension Vicinity Map
Attachment 2: Sewer Extension Financial Summary

New Construction Projects
First Addition to 1000 Oaks - Phase 7, City of Madison
Attachment 3: Map and Resolution (2019-03-14-R2) for First Addition to 1000 Oaks - Phase 7, City of Madison
Woodland Crest, Village of Waunakee
Attachment 4: Map and Resolution (2019-03-14-R3) for Woodland Crest, Village of Waunakee

Reconstruction Projects
South Bryan Street, Daley Drive, James Street and Thorp Street Reconstruction District - 2019, City of Madison
Attachment 5: Map and Resolution (2019-03-14-R4) for South Bryan Street, Daley Drive, James Street and Thorp Street Reconstruction District - 2019, City of Madison
Williamson Street and East Wilson Street Assessment District – 2019, City of Madison
Attachment 6: Map and Resolution (2019-03-14-R5) for Williamson Street and East Wilson Street Assessment District – 2019, City of Madison
Haywood Drive Reconstruction Assessment District – 2019, City of Madison
Attachment 7: Map and Resolution (2019-03-14-R6) for Haywood Drive Reconstruction Assessment District – 2019, City of Madison
Groveland Terrace Assessment District – 2019, City of Madison
Attachment 8: Map and Resolution (2019-03-14-R7) for Groveland Terrace Assessment District – 2019, City of Madison

5. Chief Engineer and Director’s Report
   Items to be covered include but are not limited to:
   A. CED Update – Mucha
   B. Regulatory/Legal Review – Kent
   C. Future Meeting Schedule
      Future Meeting Schedule as of 03-12-2019

6. Five Minute Recess
7. **Strategic Planning Session – Commission**  
   **Commission Agenda Report**  
   **Attachment 1:** Summary of 50 Year Master Plan  
   **Attachment 2:** District’s Strategic Plan  
   **Attachment 3:** “The Water Resources Utility of the Future...A Blueprint for Action”  
   **Attachment 4:** “Twelve Promises of Suncheon”  
   **Attachment 5:** Commission Global Outcome Policies  
   **Attachment 6:** Watershed Map  

8. **Future Agenda Topics**  

9. **Other Business by Law**  

10. **Adjournment**
COMMISSION AGENDA REPORT
Meeting of March 14, 2019

Election for the Commission Secretary Position and
Appointment of a Commissioner to the CED Performance Review Subcommittee

Lead Staff: D. Michael Mucha, Chief Engineer and Director

Requested Action 1: Nominate and elect a commission secretary effective immediately with an appointment that ends on Dec. 31, 2019 or when a successor is elected.

Requested Action 2: Nominate and elect a commissioner to serve on the CED performance review subcommittee.

Attachments: None.

Purpose:
The purpose for this agenda item is to elect a replacement commission secretary position and to fill the appointment to the CED performance review subcommittee.

Financial Impact:
None.

Background:
As required by Wisconsin Statutes 200.09 (5) the commission shall organize by electing one of its member’s president and another secretary. While the responsibilities of the president are not enumerated in the statutes, the secretary is required to keep a separate record of all proceedings and accurate minutes of all hearings. What this means in practical terms is that the secretary signs the commission meeting minutes after they are prepared by staff and approved by the commission.

A district practice not specified by state law is setting terms for officers. Given the larger commission board, terms are revisited and elected annually.

Analysis and Options:
Recommended Option: Nominate and elect a secretary for a term effective immediately and ending on Dec. 31, 2019 and nominate and elect a commissioner to the CED performance review subcommittee.
Key considerations:
- The district would be in conformance with state law.
- By setting annual elections, all commissioners have the opportunity to serve in an expanded role.
- The CED performance review process will proceed with three commission representatives.

Next Steps:
The commission secretary appointment would become effective immediately and the commission member elected to the CED performance review subcommittee would commence work with Commissioner Hovel and Commissioner Meyer.
Meeting of the Commissioners of the Madison Metropolitan Sewerage District

Thursday, Feb. 28, 2019 8 a.m.
District Maintenance Facility Training Room, 1610 Moorland Road, Madison, WI  53713

Present:  Commissioner Tom Hovel
Commissioner Ken Clark
Commissioner Sara Eskrich (via GoToMeeting)
Commissioner James Martin
Commissioner Ezra Meyer
Commissioner Brad Murphy
Commissioner Mary Swanson
Commissioner Tom Wilson

Excused Absence: Commissioner Angela James

Commission Meeting

1. Opening
   A. Call to Order 8:00 a.m.
   B. Welcome Guests: Bob Wipperfurth, President of Windsor Dane County Cities and Villages Association; Greg Fries, City of Madison and Jeffrey Svein, Wells Fargo
   C. Announcements: None.

2. Appearances by the Public: None.

3. Consent Calendar
   A. Approval Meeting Minutes from 2-14-2019
   B. Review and Approval of Sewer Extension Plans

   Discussion: The 2-14-2019 minutes, sewer extension plans for Eagle Trace Phase 2, Acacia Ridge Phase 1, 2002 Tennyson Lane, 6798 Conservancy Condominiums and East Johnson Reconstruction (resolutions 2019-02-28-R1 – 2019-02-28-R6), approval of contract authority for Metrogro hauling (resolution 2019-02-28R7) and approval of construction phase engineering services for NEI Truax (2019-02-28-R7) were reviewed and placed on file.

   Action: Commissioner Wilson moved, seconded by Commissioner Meyer to approve items A and B of the consent calendar.

   Motion carried 7-0.
4. **Contracting Approval for Shop One Project**

*Presenter:* Martye Griffin, Director of Ecosystems Services  
*Description:* Mr. Griffin gave an informational presentation and requested the commission to authorize approval of resolution 2019-02-28-R8.  
*Discussion:* The commission is requested to approve resolution 2019-02-28-R8, which authorizes a contract with Strang and Tri-North for an amount up to $170,000 and authorizes total project costs of $200,000 for the Shop One project.

*Action:* After discussion Commissioner Wilson moved, seconded by Commissioner Meyer to approve resolution 2019-02-28-R8.

Motion carried 7-0.

*Commissioner Eskrich joined the meeting via conference call at approximately 8:30 a.m.*

5. **Review and Award of Contract: Metrogro Applicator Replacement**

*Presenter:* Kim Meyer, Resource Recovery Manager  
*Description:* Ms. Meyer gave an informational presentation and background on the Metrogro biosolids program and fleet information.  
*Discussion:* The commission was requested to approve resolution 2019-02-28-R9 to enter into a contract with Oxbo International for the purchase of a replacement applicator to be used for management of Metrogro liquid biosolids. The purchase contract price of the applicator is $628,558.

*Action:* Commissioner Meyer moved, seconded Commissioner Murphy to approve resolution 2019-02-28-R9.

Motion carried 8-0.

6. **Authorization of Automatic Transfer of Third Power Feeds at Pumping Stations 10 and 11**

*Presenter:* Dave Lundey, Electrical Construction Manager  
*Description:* Mr. Lundey gave an informational presentation and answered questions related to power feeds to Pumping Stations 10 and 11.  
*Discussion:* The commission was requested to approve resolution 2019-02-28-R10 which approves authorizing the automatic transfer of the third power feeds at Pumping Stations 10 & 11 and authorizing Madison Gas & Electric (MG&E) to install the required systems for a cost of $168,815.

*Action:* Commissioner Wilson moved, seconded by Commissioner Murphy to approve resolution 2019-02-28-R10.

Motion carried 8-0.
7. **Chief Engineer and Director’s Report**
   A. CED Update: Mr. Mucha gave a brief update on several items. First he briefed the commission on next steps for the upcoming strategic planning session. He then engaged the commission in a discussion related to commission meeting times and whether they would like to change meeting times/days. The commission determined no change of meeting dates/times was necessary. Mr. Mucha then reported that he was preparing a 2018 deviation summary report that would be sent to the DNR and he gave a brief summary of the three deviations that occurred in 2018. He then reported on a recent inclusion and diversity workshop that was held at the district related to racial justice. Last, Mr. Mucha informed the commission of an upcoming community meeting that will be held at the district on March 20, 2019 and he mentioned an upcoming National Association of Clean Water Agencies (NACWA) meeting in Washington DC that both commissioners and executive staff of the district would be attending.
   **Action:** None.

   B. Regulatory and Legal review: Vanessa Wishart of Stafford and Rosenbaum gave a brief regulatory/legal update.
   **Action:** None.

   **Action:** None.

   D. Future Meeting Schedule
   **Action:** None.

8. **Future Agenda Topics**
   **Action:** An update on inclusion and diversity work with the YWCA will be scheduled for a future meeting.

9. **Other Business by Law**
   **Action:** None.

10. **Adjournment**
    **Action:** Commissioner Clark moved, seconded by Commissioner Wilson to adjourn the meeting.

    Motion carried 8-0 at 9:22 a.m.

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Regular Meeting of the Commissioners
Thursday, March 14, 2019 at 8 a.m.--Regular Meeting and Strategic Planning Session
Thursday, March 28, 2019 at 8 a.m.
Thursday, April 11, 2019 at 8 a.m.

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Angela James, Secretary
WHEREAS, plans for sanitary sewer extensions were submitted to the Madison Metropolitan Sewerage District ("the district") for Eagle Trace Phase 2, in the City of Madison, on Feb. 1, 2019, by Kyle Frank, City Engineering Division, and

WHEREAS, the project consists of installing 2,423 feet of 8-inch and 10-inch diameter sanitary sewer on Tawny Elm Parkway, Sister Oak Drive, Hollow Aspen Lane, White Fox Lane, Rustic Rise Way and North Sugar Maple Lane, and

WHEREAS, the lands which can be served by the proposed sewers are lots 9-16, 49, 66-68, 80-89, 111-116, 132-133, 144-149, 157-165, 180 and 201 of the plat of Eagle Trace, and

WHEREAS, lots 14-16, 49, 66-67, 158, and 162-163 are adjacent to sewers that were previously approved on June 14, 2018 as sewer plan number 2018-054 for Eagle Trace Phase 1. Payment of conveyance facility connection charges and treatment plant connection charges has been received for these lots. These lots are hereinafter referred to as the "paid lots", and

WHEREAS, lots 80, 111-115, 132-133 and 148 of the plat of Eagle Trace are adjacent to proposed sewers, but are not included within the city's development agreement for the current phase. Said lots are not being developed and are not connecting to the public sewer system at this time, and are hereinafter referred to as the deferred lots, and

WHEREAS, the proposed sanitary sewer extension will connect to City of Madison's sanitary sewerage facilities, and

WHEREAS, lots 9-13, 68, 87-89, 157, 164-165, 180 and 201 will be served by the district’s Nine Springs Valley Interceptor/Essee Pond extension basin and are hereinafter referred to as the NSVIEP lots, and

WHEREAS, lots 81-86, 116, 144-147, 149, and 159-161 are within the district’s Lower Badger Mill Creek Interceptor basin and are hereinafter referred to as the LBMC lots, and

WHEREAS, future construction of the City of Madison’s West Elderberry Neighborhood Sanitary Sewer Interceptor is required to provide sanitary sewer service to the LBMC lots. The City of Madison Common Council authorized acquisition of the necessary easement to construct this sewer by resolution 18-00749 (ID 53305) on Oct. 30, 2018. A functional sanitary sewer is anticipated in the fall of 2019 to accommodate occupancy of lots constructed in Eagle Trace Phase 2, and

WHEREAS, plan review fees are due, and
WHEREAS, except for the aforementioned paid lots, conveyance facility and treatment plant connection charges for the lands to be served have not been paid, and

WHEREAS, regarding the NSVIEP lots, the district has received sewer extension review letter #6-19-3 from the Capital Area Regional Planning Commission (CARPC) dated Feb. 18, 2019 stating the CARPC staff has reviewed the proposed extension and determined that it is consistent with the urban service area provisions of the “Dane County Water Quality Plan” and the “Dane County Land Use and Transportation Plan”, and is consistent with the conditions of DNR approval letter DC-0192, dated Feb. 15, 2018, which added this area to the Central Urban Service Area, and

WHEREAS, regarding the LBMC lots, the district has received sewer extension review letter #6-19-4 from CARPC dated Feb. 18, 2019 stating the CARPC staff has reviewed the proposed extension, and has determined that its ultimate service area is currently within the urban service area but portions of the downstream connecting sanitary sewer are proposed to be installed in the future. Any service connection to this extension will require additional review, to determine its consistency with the sewer service area of the “Dane County Water Quality Plan” and the “Dane County Land Use and Transportation Plan” and fulfills the conditions of DNR approval letter DC-0192, dated Feb. 15, 2018, which added this area to the Central Urban Service Area, and

WHEREAS, the chief engineer and director of the district has recommended the approval of said plans,

THEREFORE, BE IT RESOLVED, that the plans for sanitary sewer extensions for Eagle Trace - Phase 2, in the City of Madison, submitted on Feb. 1, 2019, by Kyle Frank, City Engineering Division, be approved subject to the following conditions:

1. That the City of Madison shall pay the plan review fee of $1,475 to the district within 30 days of receiving an invoice for the fee.

2. That no building on any LBMC lot be granted an occupancy permit by the City of Madison prior to approval and construction of the downstream sewerage facilities (i.e. City of Madison’s West Elderberry Neighborhood Sanitary Sewer Interceptor across Herrling Family Limited Partnership lands).
3. That the deferred lots within the plat of Eagle Trace may not be connected to the public sewerage system at this time. Prior to installation of the proposed sewers, the City of Madison shall record a document with the Dane County Register of Deeds, indicating that district connection charges for the deferred lots have not been paid. Said deferred lots are not to be connected to the public sewerage system until appropriate conveyance facility connection charges and treatment plant connection charges have been paid. If said document is not recorded within six months of approval of this resolution, conveyance facility and treatment plant connection charges on the deferred lots shall be due by the City of Madison.

4. That prior to connection of the proposed sewers serving said lands to the public sewerage system, the City of Madison shall have paid to the district the sum of $42,747.56 for payment of $7,535.32 in Nine Springs Valley Interceptor/Esser Pond extension conveyance facility connection charges; $24,978.17 in Lower Badger Mill Creek Interceptor conveyance facility connection charges; and $10,234.07 in treatment plant connection charges; said lands being the aforementioned NSVIEP lots and LBMC lots.

5. That payment of the aforementioned conveyance facility and treatment plant connection charges shall be made to the district within six months of the date of approval. If payment in full is not received by the district within six months of approval, the approval shall become void and new plans shall be submitted.

6. That conveyance facility and treatment plant connection charges are adjusted from time to time, and said connection charges will be due based on the rate in place at the time at which the payment is made.

7. That if said connection charges for the lands to be served remain unpaid after construction of said sewer extensions, a late fee of 0.5 percent of the amount due shall be charged to the City of Madison for each month or partial month thereafter following connection. A one-time $500 administrative fee shall also be charged.

8. That the City of Madison shall require the presence of an engineer or an inspector on the construction of said sewer extensions who shall make a record showing in detail the construction as built and shall furnish the district with as-built plans in the case of any significant deviations from the original design.

9. That the construction, operation, maintenance and use of said sewer extensions shall be in accordance with the lawful rules and regulations of the district and with the applicable State of Wisconsin plumbing and sewerage codes.
10. That if construction of the sewer extensions covered by said plans has not commenced within four years following the approval date of this resolution, this approval shall become void and new plans shall be submitted. If construction has commenced but has not been completed within the four-year approval period, the unbuilt portion must be submitted for reapproval if it is a significant portion of the project and would require DNR approval.

The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held at the district on Feb. 28, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT

Attested by:

[Signature]
Thomas Hovel, President

[Signature]
Angela James, Secretary
ACACIA RIDGE PHASE 1
2019-02-28-R2

WHEREAS, plans for sanitary sewer extensions were submitted to the Madison Metropolitan Sewerage District ("the district") for Acacia Ridge Phase 1, in the City of Madison, on Feb. 8, 2019, by Mark Moder, City Engineering Division, and

WHEREAS, the project consists of installing 2,962 feet of 8-inch, 10-inch, 12-inch and 15-inch diameter sanitary sewer on Watts Road, Feather Sound Drive, Highland Gate Way, Roman Mist Way and within a public sanitary sewer easement, and can provide service to lots 16-30, 35-43, 72-102 and outlots 1, 3, 4, 5, 8 and 9 of the unrecorded plat of Acacia Ridge, and

WHEREAS, lots 16-30, 38-43, 75-89 and 93-99 of the unrecorded plat of Acacia Ridge are included within the city’s development agreement for phase 1, and are hereinafter referred to as the phase 1 lots, and

WHEREAS, lots 35-37, 72-74, 90-92 and 100-102 of the unrecorded plat of Acacia Ridge are adjacent to proposed sewers, however are not included within the city’s development agreement for phase 1. Said lots are not being developed and connecting to the public sewer system at this time, and are hereinafter referred to as the deferred lots, and

WHEREAS, outlots 1 and 4 of the unrecorded plat of Acacia Ridge are recognized by the Capital Area Regional Planning Commission as being within an environmental corridor. Outlots 3, 5, 8 and 9 of the unrecorded plat of Acacia Ridge are being dedicated to the public for alley purposes, which are public right-of-ways. These six outlots will not be receiving sanitary sewer service are hereinafter referred to as the exempt outlots, and

WHEREAS, the proposed sanitary sewer extension will connect to City of Madison’s sanitary sewerage facilities and is within the district’s Lower Badger Mill Creek Interceptor basin, and

WHEREAS, conveyance facility connection charges and treatment plant connection charges for outlot 1 of the plat of Cardinal Glenn were previously paid with the district sewer extension plan number 2013-021 for Cardinal Glenn Phase 7. Said outlot 1 is being replatted and will now be part of lot 23 of Acacia Ridge, and

WHEREAS, with the exception of the aforementioned Cardinal Glenn Outlot 1, conveyance facility connection charges and treatment plant connection charges for the phase 1 lots have not been paid, and

WHEREAS, plan review fees are due, and
WHEREAS, the district has received a sewer extension review letter #6-19-6 from the Capital Area Regional Planning Commission (CARPC) dated Feb. 18, 2019 stating the CARPC staff has reviewed the proposed extension and determined that it is consistent with the urban service area provisions of the “Dane County Water Quality Plan” and the “Dane County Land Use and Transportation Plan” and consistent with the conditions of resolutions DCRPC No. 1026, which added this area to the Central Urban Service Area, and

WHEREAS, the chief engineer and director of the district has recommended the approval of said plans,

THEREFORE, BE IT RESOLVED, that the plans for sanitary sewer extensions for Acacia Ridge Phase 1, in the City of Madison, submitted on Feb. 8, 2019, by Mark Moder, City Engineering Division, be approved subject to the following conditions:

1. That the City of Madison shall pay the plan review fee of $1,475 to the district within 30 days of receiving an invoice for the fee.

2. That the aforementioned deferred lots may not be connected to the public sewerage system at this time. Prior to installation of the proposed sewers, the City of Madison shall record a document with the Dane County Register of Deeds, indicating that district connection charges for the deferred lots have not been paid. Said deferred lots are not to be connected to the public sewerage system until appropriate conveyance facility connection charges and treatment plant connection charges have been paid. If said document is not recorded within six months of approval of this resolution, conveyance facility and treatment plant connection charges on the deferred lots shall be due by the City of Madison.

3. That the aforementioned exempt lots are exempted from conveyance facility and treatment plant connection charges.

4. That prior to connection of the proposed sewers to the public sewerage system, the City of Madison shall have paid to the district the sum of $102,525.11 for payment of $83,742.06 in Lower Badger Mill Creek Interceptor basin conveyance facility connection charges and $18,783.05 in treatment plant connection charges for the lands to be served; said lands being the aforementioned phase 1 lots.

5. That if lot areas shown on the final, recorded plat of Acacia Ridge differ from the unrecorded plat submitted to the district for approval, additional conveyance facility and treatment plant connection charges may be due from the City of Madison.

6. That payment of the aforementioned conveyance facility and treatment plant connection charges shall be made to the district within six months of the date of approval of this resolution. If payment in full is not received by the district within six months of the date of this resolution, the approval shall become void and new plans shall be submitted.
7. That conveyance facility and treatment plant connection charges are adjusted from time to time and said connection charges will be due based on the rate in place at the time at which the payment is made.

8. That if said connection charges remain unpaid after construction of said sewer extensions, a late fee of 0.5 percent of the amount due shall be charged to the City of Madison for each month or partial month thereafter following connection. A one-time $500 administrative fee shall also be charged.

9. That the City of Madison shall require the presence of an engineer or an inspector on the construction of said sewer extensions who shall make a record showing in detail the construction as built and shall furnish the district with as-built plans in the case of any significant deviations from the original design.

10. That the construction, operation, maintenance and use of said sewer extensions shall be in accordance with the lawful rules and regulations of the district and with the applicable State of Wisconsin plumbing and sewerage codes.

11. That if construction of the sewer extensions covered by said plans has not commenced within four years following the approval date of this resolution, this approval shall become void and new plans shall be submitted. If construction has commenced but has not been completed within the four-year approval period, the unbuilt portion must be submitted for reapproval if it is a significant portion of the project and would require DNR approval.

The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held at the district on Feb. 28, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT

Attested by:

Thomas Hovel, President

Angela James, Secretary
2002 TENNYSON LANE
2019-02-28-R3

WHEREAS, plans for sanitary sewer extensions were submitted to the Madison Metropolitan Sewerage District ("the district") for 2002 Tennyson Lane, in the City of Madison, on Feb. 14, 2019, by Mark Moder, City Engineering Division, under the professional seal of Adam Ryan of Quam Engineering, and

WHEREAS, the project consists of installing 91 feet of 8-inch diameter sanitary sewer on Tennyson Lane to provide service to two apartment buildings proposed for construction on lot 1 of CSM 13716, and

WHEREAS, the proposed sanitary sewer extension will connect to City of Madison's sanitary sewerage facilities and is within the district’s Northeast Interceptor/Waunakee-DeForest extension basin, and

WHEREAS, conveyance facility and treatment plant connection charges for the lands to be served have been previously paid, and

WHEREAS, plan review fees are due, and

WHEREAS, the district has received a sewer extension review letter #6-19-7 from the Capital Area Regional Planning Commission (CARPC) dated Feb. 22, 2019 stating the CARPC staff has reviewed the proposed extension and determined that it is consistent with the urban service area provisions of the “Dane County Water Quality Plan” and the “Dane County Land Use and Transportation Plan”, and

WHEREAS, the chief engineer and director of the district has recommended the approval of said plans,

THEREFORE, BE IT RESOLVED, that the plans for sanitary sewer extensions for 2002 Tennyson Lane, in the City of Madison, submitted on Feb. 14, 2019, by Mark Moder, City Engineering Division, under the professional seal of Adam Ryan of Quam Engineering, be approved subject to the following conditions:

1. That the City of Madison shall pay the plan review fee of $1,475 to the district within 30 days of receiving an invoice for the fee.

2. That the City of Madison shall require the presence of an engineer or an inspector on the construction of said sewer extensions who shall make a record showing in detail the
construction as built and shall furnish the district with as-built plans in the case of any significant deviations from the original design.

3. That the construction, operation, maintenance and use of said sewer extensions shall be in accordance with the lawful rules and regulations of the district and with the applicable State of Wisconsin plumbing and sewerage codes.

4. That if construction of the sewer extensions covered by said plans has not commenced within four years following the approval date of this resolution, this approval shall become void and new plans shall be submitted. If construction has commenced but has not been completed within the four-year approval period, the unbuilt portion must be submitted for reapproval if it is a significant portion of the project and would require DNR approval.

The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held at the district on Feb. 28, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT

Attested by:

Thomas Hovel, President

for Angela James, Secretary
6798 CONSERVANCY CONDOMINIUMS
2019-02-28-R4

WHEREAS, plans for sanitary sewer extensions were submitted to the Madison Metropolitan Sewerage District ("the district") for 6798 Conservancy Condominiums, in the Village of DeForest, on Feb. 15, 2019, by Ryan Quam of Quam Engineering, and

WHEREAS, the project consists of installing 507 feet of 8-inch diameter sanitary sewer within a public sanitary sewer easement, shown on CSM 15036, and

WHEREAS, the lands which can be served are lot 1, and outlots 1-2 of CSM 15036, and

WHEREAS, outlots 1 and 2 of CSM 15036 have been dedicated to the public for environmental corridor, stormwater and recreation purposes. A portion of lot 1 of CSM 15036 is delineated by a 75-foot wetland buffer. Said outlots 1-2 and the aforementioned portion of lot 1 below the 75-foot wetland buffer are recognized by the Capital Area Regional Planning Commission as being within an environmental corridor, will not receive sanitary sewer service, and are hereinafter referred to as the exempt lands, and

WHEREAS, the proposed sanitary sewer extension will connect to Village of DeForest's sanitary sewerage facilities, and is within the district's Northeast Interceptor/Waunakee-DeForest extension basin, and

WHEREAS, plan review fees are due, and

WHEREAS, conveyance facility and treatment plant connection charges for the lands to be served were previously paid with sewer extension plan number 2004-075 for Hawthorn Point at Conservancy Place Phase 1, and

WHEREAS, the district has received a sewer extension review letter #175-19-1 from the Capital Area Regional Planning Commission (CARPC) dated Feb. 13, 2019 stating the CARPC staff has reviewed the proposed extension and determined that it is consistent with the urban service area provisions of the "Dane County Water Quality Plan" and the "Dane County Land Use and Transportation Plan", and is consistent with the conditions of resolution DCRPC No. 855, which added this area to the Northern Urban Service Area, and

WHEREAS, the chief engineer and director of the district has recommended the approval of said plans,

THEREFORE, BE IT RESOLVED, that the plans for sanitary sewer extensions for 6798 Conservancy Condominiums, in the Village of DeForest, submitted on Feb. 15, 2019, by Ryan Quam of Quam Engineering, be approved subject to the following conditions:
1. That the Village of DeForest shall pay the plan review fee of $1,475 to the district within 30 days of receiving an invoice for the fee.

2. That the aforementioned exempt lands are exempt from conveyance facility and treatment plant connection charges.

3. That the Village of DeForest shall require the presence of an engineer or an inspector on the construction of said sewer extensions who shall make a record showing in detail the construction as built and shall furnish the district with as-built plans in the case of any significant deviations from the original design.

4. That the construction, operation, maintenance and use of said sewer extensions shall be in accordance with the lawful rules and regulations of the district and with the applicable State of Wisconsin plumbing and sewerage codes.

5. That if construction of the sewer extensions covered by said plans has not commenced within four years following the approval date of this resolution, this approval shall become void and new plans shall be submitted. If construction has commenced but has not been completed within the four-year approval period, the unbuilt portion must be submitted for reapproval if it is a significant portion of the project and would require DNR approval.

The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held at the district on Feb. 28, 2019.

**MADISON METROPOLITAN SEWERAGE DISTRICT**

*Attested by:*

[Signature]
Thomas Hovel, President

[Signature]
Angela James, Secretary
EAST JOHNSON STREET RECONSTRUCTION  
2019-02-28-R5

WHEREAS, plans for sanitary sewer extensions were submitted to the Madison Metropolitan Sewerage District ("the district") for East Johnson Street Reconstruction, in the City of Madison, on Feb. 15, 2019, by Mark Moder, City Engineering Division, under the professional seal of Stephanie Thomsen of Strand Associates, and

WHEREAS, the project will replace 1,351 feet of 8-inch, 10-inch and 12-inch diameter sanitary sewer on East Johnson Street, North Baldwin Street, Marston Avenue and North Dickinson Street. The sewers have been determined to be in poor condition, undersized and are being installed in conjunction with the street reconstruction project, and

WHEREAS, no new lands will be served as part of this project, and

WHEREAS, a variance is being requested from DNR Chapter NR 811.74(2) by the City of Madison for some of the proposed sewers which will have less than the minimum 8 feet of horizontal separation from existing water main. The project proposes to install AWWA C900 DR18 sanitary sewer main where the required minimum horizontal separation from existing water main is not attained, and

WHEREAS, the proposed sanitary sewer extension will connect to City of Madison’s sanitary sewerage facilities, and is within the district’s East Interceptor basin, and

WHEREAS, conveyance facility connection charges for the areas being served have been paid, and

WHEREAS, plan review fees are waived for street reconstruction projects, and

WHEREAS, the district has received a sewer extension review letter #6-19-8 from the Capital Area Regional Planning Commission (CARPC) dated Feb. 22, 2019 stating the CARPC staff has reviewed the proposed extension and determined that it is consistent with the urban service area provisions of the "Dane County Water Quality Plan" and the "Dane County Land Use and Transportation Plan", and

WHEREAS, the chief engineer and director of the district has recommended the approval of said plans,

THEREFORE, BE IT RESOLVED, that the plans for sanitary sewer extensions for East Johnson Street Reconstruction, in the City of Madison, submitted on Feb. 15, 2019, by Mark Moder, City
Engineering Division, under the professional seal of Stephanie Thomsen of Strand Associates, be approved subject to the following conditions:

1. That the City of Madison shall require the presence of an engineer or an inspector on the construction of said sewer extensions who shall make a record showing in detail the construction as built and shall furnish the district with as-built plans in the case of any significant deviations from the original design.

2. That the construction, operation, maintenance and use of said sewer extensions shall be in accordance with the lawful rules and regulations of the district and with the applicable State of Wisconsin plumbing and sewerage codes.

3. That if construction of the sewer extensions covered by said plans has not commenced within four years following the approval date of this resolution, this approval shall become void and new plans shall be submitted. If construction has commenced but has not been completed within the four-year approval period, the unbuilt portion must be submitted for reapproval if it is a significant portion of the project and would require DNR approval.

The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held at the district on Feb. 28, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT

Attested by:

[Signature]
Thomas Hovel, President

[Signature]
Angela James, Secretary
REVIEW AND APPROVAL OF CONTRACT AUTHORITY FOR METROGRO HAULING
2019-02-28-R6

WHEREAS, thirty-four to thirty-eight million gallons of Metrogro produced each year is hauled to area farm fields by semi-trucks pulling tanker trailers, and applied by in field applicators, and

WHEREAS, the district owns fifteen tanker trailers which are pulled by contracted semi-trucks with contracted employees, and

WHEREAS, the district owns in-field applicators, all of which are operated by contracted employees, and

WHEREAS, the 2019 approved operating budget contains $740,000 for contract hauling and application operations, and

WHEREAS, the district posted the request in the newspaper and on the district website, which is consistent with the district’s procurement policies, and requested contractors indicate their interest in hauling Metrogro for the 2019 year, and

WHEREAS, eight contractors have been chosen through a submittal scoring process to fill the fifteen semi-tractor and five equipment operator vacancies, and

WHEREAS, the chief engineer and director of the district has recommended the approval of the contracts, and

WHEREAS, the project will be financed by the 2019 approved operating budget.

NOW, THEREFORE, BE IT RESOLVED by the Madison Metropolitan Sewerage District Commission, and following consideration of the above recitals which are incorporated by reference, as follows:

1. The commission awards hauling contracts to approved contractors for the 2019 hauling season for $740,000.

2. Following completion of all required conditions, the commission authorizes the chief engineer and director to execute the hauling contracts on behalf of the district.
The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held in the district office on Feb. 28, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT

[Signature]
Thomas Hovel, President

Attested by:
[Signature]
For Angela James, Secretary

Incorporated by Reference:
Contract for Project
REVIEW AND AWARD OF CONSTRUCTION PHASE ENGINEERING SERVICES FOR THE
NORtheast INTERCEPTOR TRUAX EXTENSION RELIEF
2019-02-28-R7

WHEREAS, Strand Associates is the engineer of record for the Northeast Interceptor Truax Extension Relief project and formally approved the plans/specifications, and

WHEREAS, Strand Associates knows the details associated with the work and are best-suited to perform the construction phase engineering services required, and

WHEREAS, district staff does not have the resources to perform the work, and

WHEREAS, costs for construction phase engineering services were included in the district’s capital improvements plan and capital budget, and

WHEREAS, district staff prepared a request for proposal for this work, and

WHEREAS, district staff reviewed the proposal from Strand Associates and has prepared a professional services agreement for this work, and

WHEREAS, the cost of the construction-phase engineering services is within an acceptable range when compared with past district interceptor projects, and

WHEREAS, the award of the professional services to Strand Associates would be consistent with past practice and the intent of the procurement code.

NOW, THEREFORE, and following consideration of the above recitals which are incorporated by reference, it is hereby resolved by the Madison Metropolitan Sewerage District Commission, as follows:

1. The commission awards the construction phase engineering professional services for the Northeast Interceptor Truax Extension Relief to Strand Associates in the amount of $175,000.

2. As set forth in the commission transaction approval authority policy, any amendments to the work that exceed 10 percent of the proposed price will require commission approval.

3. The commission authorizes the chief engineer and director to execute a professional services agreement for this work on behalf of the district.
The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held in the district office on Feb. 28, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT COMMISSION

Attested by:

Thomas D. Hovel, President

For Angela James, Secretary
CONTRACTING APPROVAL FOR SHOP ONE PROJECT
RESOLUTION 2019-02-28-R8

WHEREAS, Madison Metropolitan Sewerage District’s (“the district”) Shop One represents a strategic physical asset that is slated to play a key role in achieving commission goals for improved community partnerships and increased public support, and

WHEREAS, the approved concept for Shop One focuses on its dynamic character and flexible capacity to house educational programming and tours while encouraging engagement among groups with an interest in “one water” stewardship, and

WHEREAS, transforming the historic building from its original use as a repair shop reflects the district’s conservation values even as it invites community members to experience the district’s work and inspires creative approaches to the future, and

WHEREAS, for this flexible workspace to fulfill its many potential roles, its poor acoustics must be addressed with consideration for factors including the hard, flat surfaces that contribute to unintelligible speech and audible distractions; delayed reverberations; and intrusive noise from the air handling system, road, bathrooms and other sources, and

WHEREAS, the nature of the project — involving a historic building coupled with the acoustical and lighting changes necessary to transform the space for a new purpose — favored a design-build process to allow for better scoping of constructability as well as a single point of contact for the district, and

WHEREAS, district staff requested proposals to assess the acoustical challenges and to design and construct improvements to mitigate the acoustical challenges, and received four such proposals after posting the request in the newspaper and on the district website, consistent with the district’s procurement policies, and

WHEREAS, district staff selected the team of Strang and Tri-North Builders as the highest ranking proposal based on criteria outlined in the request for proposal, consistent with the district’s procurement policies, and

WHEREAS, the commission intended to authorize a total of $206,000 for this project in the 2018 and 2019 capital projects budgets, $103,000 in each year; and,

WHEREAS, the adopted 2019 capital projects budget shows a total project cost of $103,000 for this project, and,
WHEREAS, the project will be financed by capital project fund reserves,

NOW, THEREFORE, BE IT RESOLVED by the Madison Metropolitan Sewerage District Commission, and following consideration of the above recitals which are incorporated by reference, as follows:

1. The commission awards a contract for the construction of Shop One acoustical and lighting improvements to the team of Strang and Tri-North for up to $170,000.

2. The commission increases the total authorized project cost from $103,000 to $200,000.

3. The total amount of authorized expenditures listed in the 2019 capital projects budget remains unchanged at this time based on anticipated spending in this fund for the remainder of 2019.

4. Following completion of all required conditions, the commission authorizes the chief engineer and director to execute the contract on behalf of the district.

The above resolution was adopted by the commissioners of the Madison Metropolitan Sewerage District at their meeting held in the district office on Feb. 28, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT

Attested by:

[Signature]
Thomas Hove, President

[Signature]
For Angela James, Secretary

Incorporated by Reference:
Contract for Project
REVIEW & AWARD OF CONTRACT FOR METROGRO APPLICATOR PURCHASE
2019-02-28-R9

WHEREAS, Madison Metropolitan Sewerage District ("the district") has determined the need for new liquid biosolids applicator equipment, and

WHEREAS, the district liquid biosolids program, known as Metrogro provides a valuable fertilizer product to area farm fields, and

WHEREAS, the district liquid biosolids program, known as Metrogro, allows the district to maintain 18 million gallons of solids storage by hauling liquid biosolids and applying to farm fields from March through November annually, and

WHEREAS, the replacement of Metrogro applicator equipment was included in the district’s capital improvements plan and budget, and

WHEREAS, district staff researched the equipment market and evaluated viable options, and

WHEREAS, district staff met with equipment manufacturers and local implement dealers who specialize in large farm equipment consistent with the district’s procurement policies, and

WHEREAS, district staff reviewed manufacturers proof of responsibility, including but not limited to standard information regarding financial ability, equipment, experience in the large farm equipment industry and other matters that the district requires for the protection and welfare of the public in the performance of the equipment, all as permitted by district policy, and

WHEREAS, the district received a quotes from qualified manufacturers and noted no abnormalities among the quotes received, and

WHEREAS, the applicator purchase will be financed by capital reserves.

NOW, THEREFORE, BE IT RESOLVED by the Madison Metropolitan Sewerage District Commission, and following consideration of the above recitals which are incorporated by reference, as follows:

1. The commission awards a contract for the purchase of an all-in-one self-propelled liquid applicator to Oxbo International, at its price quote of $628,558.

2. Following completion of all required conditions, the commission authorizes the chief engineer and director to execute the contract on behalf of the district.
The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held in the district office on Feb. 28, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT

Thomas Hovel, President

Attested by:

Angela James, Secretary

Incorporated by Reference:
Contract for Project
AUTHORIZATION OF AUTOMATIC TRANSFER OF THIRD POWER FEEDS AT PUMPING STATIONS 10 AND 11
2019-02-28-R10

WHEREAS, Pumping Stations 10 and 11 currently have two separate power sources from the utility company, Madison Gas & Electric ("MG&E"), and

WHEREAS, in the event of a loss of power from one source, the stations are equipped to automatically transfer power to the second source, and

WHEREAS, both stations also have a third utility power source available, but the current configuration requires manual intervention by MG&E to transfer power to this source, and

WHEREAS, Madison Metropolitan Sewerage District (the “district”) has determined the need to automate transfer of the third power feeds at Pumping Stations 10 and 11 to provide increased collection system reliability and resiliency, and

WHEREAS, automatic transfer of the third power feeds at Pumping Stations 10 and 11 was included in the district’s capital Improvements plan and budget, and

WHEREAS, Madison Gas & Electric is the utility company that owns and maintains the electrical system that supplies power to the pumping stations and is the only company that is allowed to perform this work, and

WHEREAS, the power transfer equipment will be owned, operated, monitored, and maintained by Madison Gas and Electric, and

WHEREAS, district staff prepared a request for proposal for this work, and

WHEREAS, district staff reviewed the proposal from Madison Gas & Electric and determined it was acceptable, and

WHEREAS, the cost of the construction services is within budgetary limits, and

WHEREAS, easements from the district to MG&E will be required for the new power transfer systems and equipment.
NOW, THEREFORE, and following consideration of the above recitals which are incorporated by reference, it is hereby resolved by the Madison Metropolitan Sewerage District Commission, as follows:

1. The commission authorizes the installation of automatic transfer of the third power feeds at Pumping Stations 10 and 11 to Madison Gas & Electric in the amount of $168,815.

2. As set forth in the Commission Transaction Approval Authority Policy, any amendments to the MG&E work that exceed 10 percent of the proposed price will require commission approval.

3. The commission authorizes the chief engineer and director to execute the MG&E proposal and any subsequent construction service agreements for this work on behalf of the district.

4. The commission authorizes the chief engineer and director to execute any easements with MG&E that may be required.

The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held in the district office on Feb. 28, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT COMMISSION

Attested by:

Thomas D. Hovel, President

for Angela James, Secretary
## Madison Metropolitan Sewerage District
### Cash Statement Operating Fund
#### For 3/14/2019 Commission Meeting
##### Balance as of 3/11/2019

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<th>Available Cash Balance Through Check No.</th>
<th>121217</th>
<th>$751,822.27</th>
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<td>Plus/Less Adjustments</td>
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<td>$751,822.27</td>
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**Add Receipts**

| Transfers & Interest                      |        | 6,500,000.00 |
| Local Government Investment Pool         |        |              |
| WF Savings                                |        |              |
| Capital Projects Savings                  |        | 7,758,450.74 |
| Rent                                     |        | 4,250.00     |
| Misc. Receipts                            | 54,569.42 | 14,317,270.16 |

**Less Disbursements**

| Transfers & Interest                      |        | 6,000,000.00 |
| Local Government Investment Pool         |        |              |
| Capital Projects Checking                 |        |              |
| WF Savings                                |        | 7,000,000.00 |
| Construction                              |        |              |
| Adaptive Management                       |        |              |
| Accounts Payable Vouchers                 | 1,168,130.02 |
| Other Disbursements                       | 376,983.20 |
| Payroll                                  | 397,859.00 | (14,942,972.22) |

**Available Cash Balance Through Check No.**

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<tr>
<th>121426</th>
<th>$126,120.21</th>
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</table>

**Current Investments**

| LGIP  | 2/9/19 Balance - Gov't Investment Pool | 8,118,099.82 |
|       | Transfer from Operating Fund           | 6,000,000.00 |
|       | Transfer to Operating Fund             |              |
|       | Transfer to Debt Service               |              |
|       | Interest - February                    | 19,334.26    |
|       | 3/11/19 Balance - Gov't Investment Pool| 14,137,434.08 |

| WFS   | 2/9/19 Balance - Wells Fargo Savings   | 191,102.30   |
|       | Transfer to Operating Checking         | (6,500,000.00)|
|       | Transfer from Operating Checking       | 7,000,000.00 |
|       | Transfer to Gov't Investment Pool      |              |
|       | Transfer from Construction Savings - 2018 Intrafund |            |
|       | Interest - February                    | 413.88       |
|       | 3/11/19 Balance - Wells Fargo Savings  | 691,516.18   |

**Total All Investments**

<table>
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Chief Engineer & Director

Madison Metropolitan Sewerage District directs the Treasurer of said District to sign or cause to be signed by facsimile checks in accordance with the following list being paid by Operating Fund Checks Nos. 121217 through 121426.

**by**

President

Acknowledged: 

City Treasurer

Secretary
### Cash Receipts, Adjustments & Wire Transfers for Operating Fund
#### March Statement

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<tr>
<th>Description</th>
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<td>Total - Adjustments</td>
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<td>Transfers &amp; Interest</td>
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<td>Local Government Investment Pool</td>
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<td>Transfer from Construction</td>
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<td>Wells Fargo Savings</td>
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<td><strong>Total - Transfers &amp; Interest</strong></td>
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<td>Sewer Service &amp; Station Charges</td>
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<td>Roy Johnson</td>
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<td><strong>Total Misc. - Other Receipts</strong></td>
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<td><strong>Total Receipts</strong></td>
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<td><strong>Total Disbursements</strong></td>
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**Total: $13,182.56**
Madison Metropolitan Sewerage District  
Cash Statement Capital Projects Fund  
For 03/14/2019 Commission Meeting  
Balances as of 03/11/2019

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<th>Available Cash Balance Through Check No.</th>
<th>$ 84,780.80</th>
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<td><strong>Plus/Less Adjustments</strong></td>
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<td>Net Available Cash Balance</td>
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<td><strong>Available Cash Balance Through Check No.</strong></td>
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**Current Investments**

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<th>LGIP</th>
<th>2/9/19 Balance - Local Gov't Investment Pool</th>
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<tr>
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<td>Transfer to Wells Fargo Savings</td>
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<td>3/11/19 Balance - Gov't Investment Pool</td>
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<table>
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<td>3/11/19 Balance - Dana Investments</td>
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| WF   | 2/9/19 Balance - Wells Fargo Savings        | 814,108.22  |
|      | Transfer from Construction checking         | -           |
|      | Transfer to Construction checking           | (800,000.00) |
|      | Transfer to General Savings - 2018 Intrafund|             |
|      | Transfer to LGIP                           | -           |
|      | Transfer to CWF Checking - PS 10 FM Rehab   |             |
|      | (Murphys Pipeline)                         |             |
|      | Interest - February                        | 198.67      |
| 3/11/19 Balance - Wells Fargo Savings      | 14,306.89   |

**Total All Investments**  
$ 6,662,257.48

Chief Engineer & Director

Madison Metropolitan Sewerage District directs the Treasurer of said District to sign or cause to be signed  
by facsimile checks in accordance with the following list being paid by Capital Projects Fund Checks Nos.  
10360 through 10365 inclusive.

by

President

Acknowledged:  

City Treasurer  
Secretary
### Cash Receipts, Adjustments & Wire Transfers for Capital Projects Fund

#### March 2019

**ADJUSTMENTS:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Total - Adjustments</td>
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<tr>
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<tr>
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<td>Transfer from LGIP</td>
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<td>Transfer from General</td>
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<td>Transfer to WF Savings Fund</td>
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<tr>
<td>Transfer from General</td>
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</tr>
<tr>
<td>Total - Transfers &amp; Interest</td>
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<td>Accounts Payable Vouchers</td>
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<td>Total - AP Vouchers</td>
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<td>Total - All disbursements</td>
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The Commission authorizes the Chief Engineer & Director to approve wire payments of an additional $1,441,596.30 for construction related work, as detailed below.

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<th>CITY OF MADISON TREASURER</th>
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<tbody>
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-$1,441,596.30 |
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<td>Cardno Inc</td>
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<td>STRAND ASSOCIATES INC</td>
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**Total** 1,526,350.83
COMMISSION AGENDA REPORT
Meeting of March 14, 2019

Expedited Boundary Annexation
2019-04 LB Lands Parcel (City of Verona)

Lead Staff: Curt Sauser, Engineering Technician

Requested Action: The commission is requested to approve resolution 2019-03-14-R1 authorizing the commission president and district chief engineer and director to execute an order to annex the specified parcel to the district.

Attachments:
Attachment 1: Resolution 2019-03-14-R1
Attachment 2: Map
Attachment 3: Legal Description
Link to: LB Lands Order of Annexation and all Exhibits

Financial Impact:
The 2019 expedited annexation fee is $1,350 per annexation. Appropriate conveyance facility and treatment plant connection charges will be due, prior to connection to the public sanitary sewer system.

Background:
LB Lands parcel (City of Verona): 32.10 acres of land which is situated on the south side of the city, adjacent to the Cathedral Point development where the County Hwy M bridge crosses US Highway 18-151. The subject lands were attached to the City of Verona from the Town of Verona through Ordinance #19-937, adopted on Jan. 28, 2019. The lands were added to the Verona Urban Service Area by Dane County Regional Planning Commission (DCRPC) resolution #896, adopted Oct. 28, 1999. The Wisconsin Department of Natural Resources approved the amendment in a letter to DCRPC dated Jan. 10, 2000.
Analysis and Options:
The requested annexation is consistent with the district’s criteria for annexations, as follows:

<table>
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<tr>
<th>Annexation Name: LB Lands Parcel</th>
<th>YES</th>
<th>GENERALLY</th>
<th>NO</th>
<th>Comments</th>
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<tr>
<td>Annexation #: 2019-04</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Contiguous to District Boundaries</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevents gaps (islands) in District Boundaries</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Includes nearby lands within USA</td>
<td></td>
<td>X</td>
<td></td>
<td>Does not include USH18-151 R/W in Section 23</td>
</tr>
<tr>
<td>Regular boundaries (follows section lines)</td>
<td>X</td>
<td></td>
<td></td>
<td>Follows municipal boundary lines</td>
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<tr>
<td>Adjacent parklands included (if possible)</td>
<td>X</td>
<td></td>
<td></td>
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</table>

Recommendation:
Approve the expedited annexation request and add the parcel to the district’s service area.

Key consideration:
- The proposed annexation is generally consistent with the five criteria identified by “Guidelines for Orderly and Efficient Addition of Territory to the District”, which was adopted by the commission on May 11, 2001. Addition of the parcel to the district’s service area will promote efficiency and economy in sewerage management.

Option 1:
Provide written objection to the expedited annexation request and schedule a public hearing for consideration of the request(s).

Key consideration:
- If the commission chooses to disapprove a request for expedited annexation, the commission must issue written determination disapproving the addition of territory within 30 days of receipt of the request (March 29, 2019). If disapproved by the commission, the territory proposed may be annexed only through the public hearing process specified in Wis. Stats. §200.15(2).

Option 2:
Other options brought forward by the commission.

Next Steps:
If approved by the commission, the parcel will be eligible to receive public sanitary sewer service. A sewer extension request must be submitted and appropriate connection fees paid prior to the lands being connected to the public sewerage system.
WHEREAS, an annexation request referred to as LB Lands was submitted to the Madison Metropolitan Sewerage District (“the district”), by Theran Jacobson of the City of Verona, on Feb. 27, 2019, and

WHEREAS, the City of Verona is requesting that approximately 32.10 acres of land generally located at the intersection of County Highway M and US Highway 18-151 be added to the boundaries of the Madison Metropolitan Sewerage District. The subject land is comprised 3 lots which were created by CSM 15050, as well as adjacent right-of-way of US Highway 18-151, County Highway M, and Range Trail. The requested annexation will allow expansion of the Cathedral Point subdivision, and

WHEREAS, the City of Verona adopted ordinance #19-937 which annexed the subject lands from the Town of Verona on Jan. 28, 2019, and

WHEREAS, the subject annexation request is consistent with section §200.15(1)(a)(3) of the Wisconsin statutes, and

WHEREAS, the proposed annexation parcel is adjacent to territory presently served by the district, and

WHEREAS, the district has sufficient design capacity to serve the lands proposed for annexation, and

WHEREAS, the subject property was added to the Central Urban Service Area by Dane County Regional Planning Commission (DCRPC) resolution #896, adopted Oct. 28, 1999. The Wisconsin Department of Natural Resources approved the Verona Urban Service Area amendment in a letter to DCRPC dated Jan. 10, 2000, and

WHEREAS, the subject annexation will promote sewerage management policies and operations; will promote public health and welfare; will effect efficiency and economy in sewerage management based upon currently accepted engineering standards regarding prevention and abatement of environmental pollution, and federal and state rules and policies in furtherance thereof; and will be consistent with adopted plans of municipal, regional and state agencies, and

WHEREAS, the chief engineer and director of the district has recommended the approval of said annexation request,
NOW, THEREFORE, and following consideration of the above recitals which are incorporated by reference, it is hereby resolved by the Madison Metropolitan Sewerage District Commission as follows:

1. The request for annexation for the LB Lands parcel, made by Theran Jacobson of the City of Verona, submitted on Feb. 27, 2019, is approved.

2. The commission president and district chief engineer and director shall execute the order for district annexation #2019-04.

3. The City of Verona shall pay the expedited annexation fee of $1,350 to the district within 30 days of receiving an invoice for the fee.

The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held at the district on March 14, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT

Attested by:

_________________________ ______________________________
Thomas Hovel, President Angela James, Secretary
Legend

- LB Lands Annexation
- Current MMSD Service Area
- DNR Sewer Service Area
- City of Verona

*2017 Aerial Photography

LB Lands Annexation
32.10 Acres

City of Verona
Town of Verona

Madison Metropolitan Sewerage District
City of Verona
MMSD Annexation No. 2019-04

Prepared by: CAS
Date: 03/14/2019
ATTACHMENT B

LEGAL DESCRIPTION - LANDS TO BE ANNEXED TO THE CITY OF VERONA

A parcel of land located in the NE1/4 of the NE1/4 of Section 27, the SE1/4 of the SE1/4 of Section 22 and in the NW1/4 of the NW1/4 of Section 26, all in T6N, R8E, Town of Verona, Dane County, Wisconsin to-wit:

Beginning at the Northwest corner of said Section 26; thence S89°34'56"E, 207.05 feet along the North line of said NW1/4; thence S18°15'08"W, 587.77 feet; thence S04°33'06"E, 233.99 feet; thence S85°26'54"W, 33.00 feet; thence N04°33'06"W, 213.55 feet to a point on the Westerly right-of-way line of Range Trail; thence S00°49'04"W, 142.86 feet along said Westerly right-of-way line and a Westerly line of Lot 218, Cathedral Point; thence N88°58'13"W, 1320.74 feet along the North lines of Lot 218, Outlot 2 and Outlot 3, Cathedral Point and the North right-of-way line of Cathedral Point Drive to the Northwest corner of said Outlot 2, also being the Southeast corner of Certified Survey Map No. 14428; thence N00°49'31"E, 966.58 feet along the East line of Certified Survey Map Nos. 14427, 14428 and 14429, the East right-of-way line of Steeple Point way, the East line of Outlot 4, Cathedral Point and the Northerly extension thereof to a point on South line of Lot 3, Certified Survey Map No. 9171; thence N88°43'41"E, 731.75 feet along said South lines of Lot 3, Certified Survey Map No. 9171 and Outlot 1, Prairie Crest; thence N85°06'37"E, 420.27 feet to a point on the South line of Lot 2, Certified Survey Map No. 7393; thence N73°41'25"E, 170.62 feet along the South line of said Lot 2, to a point on the East line of the SE1/4 of said Section 22; thence S00°27'17"E, 364.66 feet along said East line to the point of beginning. Containing 1,398,481 square feet (32.105 acres).
**COMMISSION AGENDA REPORT**

**Meeting of March 14, 2019**

**Review and Approval of Sanitary Sewer Extensions**

**Lead Staff:** Curt Sauser, Engineering Technician

**Requested Action:** Adopt resolutions 2019-03-14-R2, 2019-03-14-R3, 2019-03-14-R4, 2019-03-14-R5, 2019-03-14-R6 and 2019-03-14-R7 approving the sanitary sewer extension plans.

**Attachments:**
- **Attachment 1:** 2019-03-14 Sewer Extension Vicinity Map
- **Attachment 2:** 2019-03-14 Sewer Extension Financial Summary
- **Attachment 3:** First Addition to 1000 Oaks Phase 7 – Resolution 2019-03-14-R2 & Map
- **Attachment 4:** Woodland Crest – Resolution 2019-03-14-R3 & Map
- **Attachment 5:** Bryan James and Thorp Streets Reconstruction – Resolution 2019-03-14-R4 & Map
- **Attachment 6:** Williamson and East Wilson Street Reconstruction – Resolution 2019-03-14-R5 & Map
- **Attachment 7:** Haywood Drive Reconstruction – Resolution 2019-03-14-R6 & Map
- **Attachment 8:** Groveland Terrace Reconstruction – Resolution 2019-03-14-R7 & Map

**Financial Impact:**
A plan review fee of $1,475 will be due for the “new construction” projects for external customers which propose to install new publicly owned sewers. Conveyance facility and treatment plant connection charges will also be due for the lands which can be served from the sewers being installed, as identified above. A plan review fee is not charged for reconstruction projects.

**Background:**
The district is directed under Section 200.11(b) of the Wisconsin Statutes and NR108.04(4) of the Wisconsin Administrative Code to review and approve any proposed sanitary sewerage system construction or installation projects within the Madison Metropolitan area for which Wisconsin Department of Natural Resources approval is required.

It is requested that the commission adopt resolutions approving sanitary sewer extension plans that were reviewed by staff and placed on file with the district.
New Construction Projects:

- First Addition to 1000 Oaks - Phase 7, City of Madison
- Woodland Crest, Village of Waunakee

Reconstruction Projects:

- South Bryan Street, Daley Drive, James Street and Thorp Street Reconstruction District - 2019, City of Madison
- Williamson Street and East Wilson Street Assessment District – 2019, City of Madison
- Haywood Drive Reconstruction Assessment District – 2019, City of Madison
- Groveland Terrace Assessment District – 2019, City of Madison

Analysis and Options:

Recommendation:
Adopt resolutions approving the sewer extension plans.

Key consideration:
- Plans have been reviewed by the planning department and are acceptable.

Option 1:
Approve sewer extensions, with modifications determined by the commission.

Key consideration:
- The commission may choose to place conditions on the approval, as necessary.

Option 2:
Other options brought forward by the commission.

Next Steps:
Upon commission approval, plans will be forwarded to the Wisconsin DNR for final approval, prior to construction.
### Sewer Extension - Resolution Approvals - Year 2019

<table>
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<tr>
<th>Meeting Apvl Date</th>
<th>Sewer Plan Agenda Item</th>
<th>Sewer Extension</th>
<th>Community</th>
<th>Proposed Use</th>
<th>Length and Size</th>
<th>Plan Review Fee</th>
<th>CFCC (Conveyance Facility Charges)</th>
<th>TPCC (Treatment Plant Charges)</th>
<th>Sewer Plan Total</th>
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<td>3/14/2019</td>
<td>a.</td>
<td>First Addition to 1000 Oaks Phase 7</td>
<td>City of Madison</td>
<td>47 Residential Lots &amp; 7 Outlots</td>
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<td>75,568.02</td>
<td>16,949.58</td>
<td>93,992.60</td>
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<td>b. Woodland Crest Village of Waunakee</td>
<td>2 Commercial Lots &amp; 3 Outlots</td>
<td>City of Madison</td>
<td>1,566' - 8&quot;</td>
<td>1,475.00</td>
<td>51,580.63</td>
<td>24,537.34</td>
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<td>c. South Bryan St, Daley Dr, James St and Thorp St Reconstruction District</td>
<td>City of Madison</td>
<td>Street Reconstruction and Pump Station Replacement</td>
<td>725' - 4&quot; FM 2,895' - 8&quot;</td>
<td>0.00</td>
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<td>3/14/2019</td>
<td>d. Williamson Street and East Wilson Street Assessment District - 2019</td>
<td>City of Madison</td>
<td>Street Reconstruction</td>
<td>886' - 8&quot; 104' - 10&quot;</td>
<td>0.00</td>
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<td>3/14/2019</td>
<td>e. Haywood Drive Reconstruction Assessment District - 2019</td>
<td>City of Madison</td>
<td>Street Reconstruction</td>
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<td>3/14/2019</td>
<td>f. Groveland Terrace 2019</td>
<td>City of Madison</td>
<td>Street Reconstruction</td>
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<td>0.00</td>
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**2019 Charges Approved: Current Meeting**

- $2,950.00
- $127,148.65
- $41,486.92
- $171,585.57

**Previous Total Approved (by Resolution)**

- $8,850.00
- $162,051.49
- $55,201.91
- $226,103.40

**Current Total Approved (by Resolution)**

- $11,800.00
- $289,200.14
- $96,688.83
- $397,688.97

#### Actual vs. Budget comparison

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<td>2019 Income: Budgeted</td>
<td>$60,000.00</td>
<td>$1,825,000.00</td>
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<td>Percent of Budget</td>
<td>22%</td>
<td>19%</td>
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ICCAS_apvls.xlsx

Day of the year 70

% Yr passed by 19%
WHEREAS, plans for sanitary sewer extensions were submitted to the Madison Metropolitan Sewerage District ("the district") for First Addition to 1000 Oaks Phase 7, in the City of Madison, on Feb. 1, 2019, by Mark Moder, City Engineering Division, and

WHEREAS, the project consists of installing 2,334 feet of 8-inch diameter sanitary sewer on Sugar Maple Lane, Sunny Spring Drive, Sweet Willow Pass, Tawny Acorn Drive and Winter Basil Trail, and

WHEREAS, the lands which can be served are Lots 162-166, 221 and 249-252 of the plat of First Addition to 1000 Oaks, and also lots 291-327 and outlots 12-17 of the unrecorded plat of 1000 Oaks replat #2, and

WHEREAS, outlot 12 and outlot 17 of the unrecorded plat of 1000 Oaks replat #2 are being dedicated to the public for stormwater purposes and are recognized by the Capital Area Regional Planning Commission (CARPC) as being within an environmental corridor, and will not receive sanitary sewer service, and

WHEREAS, the proposed sanitary sewer extension will connect to City of Madison’s sanitary sewerage facilities and is within the district’s Lower Badger Mill Creek Interceptor basin, and

WHEREAS, plan review fees are due, and

WHEREAS, the district has received a sewer extension review letter #6-19-5 from CARPC dated Feb. 26, 2019 stating the CARPC staff has reviewed the proposed extension and determined that it is consistent with the urban service area provisions of the “Dane County Water Quality Plan” and the “Dane County Land Use and Transportation Plan” and the conditions of Resolution DCRPC #1026, which added this area to the Central Urban Service Area, and

WHEREAS, the chief engineer and director of the district has recommended the approval of said plans,

THEREFORE, BE IT RESOLVED, that the plans for sanitary sewer extensions for First Addition to 1000 Oaks Phase 7, in the City of Madison, submitted on Feb. 1, 2019, by Mark Moder, City Engineering Division, be approved subject to the following conditions:

1. That the City of Madison shall pay the plan review fee of $1,475 to the district within 30 days of receiving an invoice for the fee.
2. That outlot 12 and outlot 17 of the unrecorded plat of 1000 Oaks replat #2 are exempted from conveyance facility and treatment plant connection charges.

3. That prior to connection of the proposed sewers serving said lands to the public sewerage system, the City of Madison shall have paid to the district the sum of $92,517.60 for payment of $75,568.02 in Lower Badger Mill Creek conveyance facility connection charges and $16,949.58 in treatment plant connection charges for the lands to be served; said lands being lots 162-166, 221 and 249-252 of the plat of First Addition to 1000 Oaks, and also lots 291-327 and outlots 13-16 of the unrecorded plat of 1000 Oaks replat #2.

4. That if lot areas shown on the final, recorded plat of 1000 Oaks replat #2 differ from the unrecorded plat submitted to the district for approval, additional conveyance facility and treatment plant connection charges may be due from the City of Madison.

5. That payment of the aforementioned connection charges for the lands to be served shall be made to the district no later than six months from the date of approval of this resolution. If payment in full is not received by the district within six months of approval, the approval shall become void and new plans shall be submitted.

6. That conveyance facility and treatment plant connection charges are adjusted from time to time and said connection charges will be due based on the rate in place at the time at which the payment is made.

7. That if said connection charges for the lands to be served remain unpaid after construction of said sewer extensions, a late fee of 0.5 percent of the amount due shall be charged to the City of Madison for each month or partial month thereafter following connection. A one-time $500 administrative fee shall also be charged.

8. That the City of Madison shall require the presence of an engineer or an inspector on the construction of said sewer extensions who shall make a record showing in detail the construction as built and shall furnish the district with as-built plans in the case of any significant deviations from the original design.

9. That the construction, operation, maintenance and use of said sewer extensions shall be in accordance with the lawful rules and regulations of the district and with the applicable State of Wisconsin plumbing and sewerage codes.

10. That if construction of the sewer extensions covered by said plans has not commenced within four years following the approval date of this resolution, this approval shall become void and new plans shall be submitted. If construction has commenced but has not been completed within the four-year approval period, the unbuilt portion must be submitted for reapproval if it is a significant portion of the project and would require DNR approval.
The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held at the district on March 14, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT

Attested by:

________________________________  ________________________________

Thomas Hovel, President    Angela James, Secretary
WHEREAS, plans for sanitary sewer extensions were submitted to the Madison Metropolitan Sewerage District ("the district") for Woodland Crest, in the Village of Waunakee, on Feb. 22, 2019, by William Dunlop of JSD Professional Services, and

WHEREAS, the project consists of installing 1,566 feet of 8-inch diameter sanitary sewer on Simon Crestway and Sarah Lane, and can provide service to lots 1-2 and outlots 1, 2 and 3 of the unrecorded plat of Woodland Crest, and

WHEREAS, outlot 3 of the unrecorded plat of Woodland Crest is being dedicated to the public for stormwater management purposes and is recognized by the Capital Area Regional Planning Commission (CARPC) as being within an environmental corridor, and will not receive sanitary sewer service, and

WHEREAS, outlots 1-2 of the unrecorded plat of Woodland Crest are adjacent to proposed sewers, however are not included in the Village’s current development agreement for this project. Said outlots are not being developed and are not connecting to the public sanitary sewer system at this time, and are hereinafter referred to as the deferred outlots, and

WHEREAS, the proposed sanitary sewer extension will connect to Village of Waunakee’s sanitary sewerage facilities and is within the district’s Northeast Interceptor/Waunakee-DeForest extension basin, and

WHEREAS, no conveyance facility connection charges or treatment plant connection charges for any lands within the unrecorded plat of Woodland Crest have been paid, and

WHEREAS, plan review fees are due, and

WHEREAS, the district has received a sewer extension review letter #24-19-1 from CARPC dated March 6, 2019 stating the CARPC staff has reviewed the proposed extension and determined that it is consistent with the urban service area provisions of the “Dane County Water Quality Plan” and the “Dane County Land Use and Transportation Plan” and fulfills the conditions of Resolutions DCRPC #482 and DCRPC 707, which added this area to the Waunakee Urban Service Area, and

WHEREAS, the chief engineer and director of the district has recommended the approval of said plans,
THEREFORE, BE IT RESOLVED, that the plans for sanitary sewer extensions for Woodland Crest, in the Village of Waunakee, submitted on Feb. 22, 2019, by William Dunlop of JSD Professional Services, be approved subject to the following conditions:

1. That the Village of Waunakee shall pay the plan review fee of $1,475 to the district within 30 days of receiving an invoice for the fee.

2. That outlot 3 of the unrecorded plat of Woodland Crest is exempted from conveyance facility and treatment plant connection charges.

3. That the aforementioned deferred outlots may not be connected to the public sewerage system at this time. Prior to installation of the proposed sewers, the Village of Waunakee shall record a document with the Dane County Register of Deeds, indicating that district connection charges for the deferred lots have not been paid. Said deferred outlots are not to be connected to the public sewerage system until appropriate conveyance facility connection charges and treatment plant connection charges have been paid. If said document is not recorded within six months of approval of this resolution, conveyance facility and treatment plant connection charges on the deferred lots shall be due by the Village of Waunakee.

4. That prior to connection of the proposed sewers serving Woodland Crest to the public sewerage system, the Village of Waunakee shall have paid to the district the sum of $76,117.97 for payment of $51,580.63 in Northeast Interceptor/Waunakee-DeForest extension conveyance facility connection charges and $24,537.34 in treatment plant connection charges for the lands to be served; said lands being lots 1-2 of the unrecorded plat of Woodland Crest.

5. That if lot areas shown on the final, recorded plat of Woodland Crest differ from the unrecorded plat submitted to the district for approval, additional conveyance facility and treatment plant connection charges may be due from the Village of Waunakee.

6. That payment of the aforementioned conveyance facility and treatment plant connection charges shall be made to the district within six months of the date of approval of this resolution. If payment in full is not received by the district within six months of the date of this resolution, the approval shall become void and new plans shall be submitted.

7. That conveyance facility and treatment plant connection charges are adjusted from time to time and said connection charges will be due based on the rate in place at the time at which the payment is made.

8. That if said connection charges remain unpaid after construction of said sewer extensions, a late fee of 0.5 percent of the amount due shall be charged to the Village of Waunakee for each month or partial month thereafter following connection. A one-time $500 administrative fee shall also be charged.
9. That the Village of Waunakee shall require the presence of an engineer or an inspector on the construction of said sewer extensions who shall make a record showing in detail the construction as built and shall furnish the district with as-built plans in the case of any significant deviations from the original design.

10. That the construction, operation, maintenance and use of said sewer extensions shall be in accordance with the lawful rules and regulations of the district and with the applicable State of Wisconsin plumbing and sewerage codes.

11. That if construction of the sewer extensions covered by said plans has not commenced within four years following the approval date of this resolution, this approval shall become void and new plans shall be submitted. If construction has commenced but has not been completed within the four-year approval period, the unbuilt portion must be submitted for reapproval if it is a significant portion of the project and would require DNR approval.

The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held at the district on March 14, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT

Attested by:

________________________________  ______________________________
Thomas Hovel, President    Angela James, Secretary
WHEREAS, plans for sanitary sewer extensions were submitted to the Madison Metropolitan Sewerage District (“the district”) for South Bryan Street, Daley Drive, James Street and Thorp Street Reconstruction District - 2019, in the City of Madison, on Feb. 21, 2019, by Mark Moder, City Engineering Division, and

WHEREAS, the existing sewers have been determined to be in poor condition, therefore this project will replace 2,895 feet of 8-inch diameter sanitary sewer on South Bryan Street, Daley Drive, James Street and Thorp Street in the City’s Schenk-Atwood-Starkweather-Yahara neighborhood in conjunction with the street reconstruction project, and

WHEREAS, the project also proposes to replace the City’s James Street lift station due to age and replacement parts for the existing station not being readily available when repair work is needed. With the new lift station, installation of 725 feet of associated 4-inch diameter force main on James Street is also being proposed, and

WHEREAS, the proposed sanitary sewer extension is within the district’s East Interceptor basin and will connect directly to the district’s East Monona Interceptor in the right-of-way of South Fair Oaks Avenue at a new 72-inch diameter manhole which will be installed as part of this project, and

WHEREAS, a variance is being requested from DNR Chapter NR 110.13(3)(c) by the City of Madison to allow inside drop connections to sewer access structures in lieu of outside drops. Where inside drops are proposed, the city will also increase the proposed sewer access structure diameter from 4-feet to 5-feet. The city finds that inside drops allow for more precise field construction, improved maintenance and can be more easily modified with future construction. The statute allows for inside drops to be approved on a case-by-case basis, and

WHEREAS, no new lands will be served as part of this project, and

WHEREAS, conveyance facility connection charges for the areas being served have been paid, and

WHEREAS, plan review fees are waived for street reconstruction projects, and

WHEREAS, the district has received a sewer extension review letter #6-19-10 from the Capital Area Regional Planning Commission (CARPC) dated March 7, 2019 stating the CARPC staff has reviewed the proposed extension and determined that it is consistent with the urban service
area provisions of the “Dane County Water Quality Plan” and the “Dane County Land Use and Transportation Plan”, and

WHEREAS, the chief engineer and director of the district has recommended the approval of said plans,

THEREFORE, BE IT RESOLVED, that the plans for sanitary sewer extensions for South Bryan Street, Daley Drive, James Street and Thorp Street Reconstruction District - 2019, in the City of Madison, submitted on Feb. 21, 2019, by Mark Moder, City Engineering Division, be approved subject to the following conditions:

1. That the City of Madison shall invite the district to the preconstruction conference, and require the contractor to obtain a direct connection permit for the work being performed on the proposed district manhole a minimum of seven days in advance of performing any work on district facilities. Contact Ray Schneider at (608) 347-3628 or RayS@madsewer.org to coordinate.

2. That the City of Madison shall require the presence of an engineer or an inspector on the construction of said sewer extensions who shall make a record showing in detail the construction as built and shall furnish the district with as-built plans in the case of any significant deviations from the original design.

3. That the construction, operation, maintenance and use of said sewer extensions shall be in accordance with the lawful rules and regulations of the district and with the applicable State of Wisconsin plumbing and sewerage codes.

4. That if construction of the sewer extensions covered by said plans has not commenced within four years following the approval date of this resolution, this approval shall become void and new plans shall be submitted. If construction has commenced but has not been completed within the four-year approval period, the unbuilt portion must be submitted for reapproval if it is a significant portion of the project and would require DNR approval.

The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held at the district on March 14, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT

Attested by:

________________________________  ________________________________
Thomas Hovel, President        Angela James, Secretary
WHEREAS, plans for sanitary sewer extensions were submitted to the Madison Metropolitan Sewerage District (“the district”) for Williamson Street and East Wilson Street Assessment District - 2019, in the City of Madison, on Feb. 21, 2019, by Kyle Frank, City Engineering Division, and

WHEREAS, the project will replace 990 feet of 8-inch and 10-inch diameter sanitary sewer on Williamson Street, East Wilson Street and South Blount Street, located on the City’s Isthmus. The sewers have been determined to be in poor condition and undersized. The new sewers are being installed in conjunction with the street reconstruction project, and

WHEREAS, a variance is being requested from DNR Chapter NR 811.74(2) by the City of Madison for some of the proposed sewers which will have less than the minimum 8 feet of horizontal separation from existing water main. The project proposes to install AWWA C900 DR18 sanitary sewer main where the required minimum horizontal separation from existing water main is not attained, and

WHEREAS, no new lands will be served as part of this project, and

WHEREAS, the proposed sanitary sewer extension will connect to City of Madison’s sanitary sewerage facilities, and is within the district’s East Interceptor basin, and

WHEREAS, conveyance facility connection charges for the areas being served have been paid, and

WHEREAS, plan review fees are waived for street reconstruction projects, and

WHEREAS, the district has received a sewer extension review letter #6-19-13 from the Capital Area Regional Planning Commission (CARPC) dated March 7, 2019 stating the CARPC staff has reviewed the proposed extension and determined that it is consistent with the urban service area provisions of the “Dane County Water Quality Plan” and the “Dane County Land Use and Transportation Plan”, and

WHEREAS, the chief engineer and director of the district has recommended the approval of said plans,

THEREFORE, BE IT RESOLVED, that the plans for sanitary sewer extensions for Williamson Street and East Wilson Street Assessment District - 2019, in the City of Madison, submitted on
Feb. 21, 2019, by Kyle Frank, City Engineering Division, be approved subject to the following conditions:

1. That the City of Madison shall require the presence of an engineer or an inspector on the construction of said sewer extensions who shall make a record showing in detail the construction as built and shall furnish the district with as-built plans in the case of any significant deviations from the original design.

2. That the construction, operation, maintenance and use of said sewer extensions shall be in accordance with the lawful rules and regulations of the district and with the applicable State of Wisconsin plumbing and sewerage codes.

3. That if construction of the sewer extensions covered by said plans has not commenced within four years following the approval date of this resolution, this approval shall become void and new plans shall be submitted. If construction has commenced but has not been completed within the four-year approval period, the unbuilt portion must be submitted for reapproval if it is a significant portion of the project and would require DNR approval.

The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held at the district on March 14, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT

Attested by:

_________________________________  ________________________________
Thomas Hovel, President    Angela James, Secretary
Haywood Drive Reconstruction Assessment District - 2019
City of Madison
MMSD Plan No. 2019-024

Legend

- Proposed Sewers
- Existing Sewers

*2017 Aerial Photography

Map Scale

0 100 200 Feet

3 MMSD Direct Connection permits will be required as part of this project
-MH02-611
-MH02-610
-MH02-609 + all incidental lateral connections to MMSD
WHEREAS, plans for sanitary sewer extensions were submitted to the Madison Metropolitan Sewerage District (“the district”) for Haywood Drive Reconstruction Assessment District - 2019, in the City of Madison, on Feb. 21, 2019, by Matthew Allie, City Engineering Division, and

WHEREAS, the project will replace 466 feet of 8-inch diameter sanitary sewer on Haywood Drive, located in the vicinity of the SSM Health St. Mary’s Hospital. The sewers have been determined to be in poor condition and are being installed in conjunction with the street reconstruction project, and

WHEREAS, the proposed sanitary sewer extension will connect directly to the district’s Southwest Interceptor / Haywood Drive extension which is planned for installation in the spring of 2019, and

WHEREAS, a variance is being requested from DNR Chapter NR 110.13(3)(b) by the City of Madison for some of the proposed sewers where manhole spacing exceeds 400 feet. The Madison Sewer Utility is capable of cleaning sewers up to 700 feet in length, and believes their maintenance program can satisfactorily accommodate the new sewer mains at the lengths proposed, and

WHEREAS, no new lands will be served as part of this project, and

WHEREAS, conveyance facility connection charges for the areas being served have been paid, and

WHEREAS, plan review fees are waived for street reconstruction projects, and

WHEREAS, the district has received a sewer extension review letter #6-19-11 from the Capital Area Regional Planning Commission (CARPC) dated March 7, 2019 stating the CARPC staff has reviewed the proposed extension and determined that it is consistent with the urban service area provisions of the “Dane County Water Quality Plan” and the “Dane County Land Use and Transportation Plan”, and

WHEREAS, the chief engineer and director of the district has recommended the approval of said plans,
THEREFORE, BE IT RESOLVED, that the plans for sanitary sewer extensions for Haywood Drive Reconstruction Assessment District - 2019, in the City of Madison, submitted on Feb. 21, 2019, by Matthew Allie, City Engineering Division, be approved subject to the following conditions:

1. That the City of Madison shall invite the district to the preconstruction conference, and require the contractor to obtain direct connection permits for the work being performed on the proposed district manholes a minimum of seven days in advance of performing any work on district facilities. Contact Ray Schneider at (608) 347-3628 or RayS@madsewer.org to coordinate.

2. That the City of Madison shall require the presence of an engineer or an inspector on the construction of said sewer extensions who shall make a record showing in detail the construction as built and shall furnish the district with as-built plans in the case of any significant deviations from the original design.

3. That the construction, operation, maintenance and use of said sewer extensions shall be in accordance with the lawful rules and regulations of the district and with the applicable State of Wisconsin plumbing and sewerage codes.

4. That if construction of the sewer extensions covered by said plans has not commenced within four years following the approval date of this resolution, this approval shall become void and new plans shall be submitted. If construction has commenced but has not been completed within the four-year approval period, the unbuilt portion must be submitted for reapproval if it is a significant portion of the project and would require DNR approval.

The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held at the district on March 14, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT

Attested by:

________________________________  ______________________________
Thomas Hovel, President    Angela James, Secretary
WHEREAS, plans for sanitary sewer extensions were submitted to the Madison Metropolitan Sewerage District (“the district”) for Groveland Terrace Assessment District - 2019, in the City of Madison, on Feb. 25, 2019, by Mark Moder, City Engineering Division, and

WHEREAS, the project will replace 1,246 feet of 8-inch and 10-inch diameter sanitary sewer on Groveland Terrace, Douglas Trail and Acacia Lane, in the vicinity of Robert M. La Follette High School. The sewers have been determined to be in poor condition and are being replaced in conjunction with the street reconstruction project, and

WHEREAS, no new lands will be served as part of this project, and

WHEREAS, the proposed sanitary sewer extension will connect to City of Madison’s sanitary sewerage facilities, and is within the district’s East Interceptor basin, and

WHEREAS, a variance is being requested by the City of Madison from DNR Chapter NR 110.13(2)(c) for some of the proposed sewers which do not meet minimum design standard for slope, and

WHEREAS, the Madison Sewer Utility employs an aggressive maintenance schedule with state of the art equipment, and believes their maintenance program can satisfactorily accommodate the new sewer mains with less than minimum slope, and

WHEREAS, conveyance facility connection charges for the areas being served have been paid, and

WHEREAS, plan review fees are waived for street reconstruction projects, and

WHEREAS, the district has received a sewer extension review letter #6-19-14 from the Capital Area Regional Planning Commission (CARPC) dated March 8, 2019 stating the CARPC staff has reviewed the proposed extension and determined that it is consistent with the urban service area provisions of the “Dane County Water Quality Plan” and the “Dane County Land Use and Transportation Plan”, and

WHEREAS, the chief engineer and director of the district has recommended the approval of said plans,
THEREFORE, BE IT RESOLVED, that the plans for sanitary sewer extensions for Groveland Terrace Assessment District - 2019, in the City of Madison, submitted on Feb. 25, 2019, by Mark Moder, City Engineering Division, be approved subject to the following conditions:

1. That the City of Madison shall require the presence of an engineer or an inspector on the construction of said sewer extensions who shall make a record showing in detail the construction as built and shall furnish the district with as-built plans in the case of any significant deviations from the original design.

2. That the construction, operation, maintenance and use of said sewer extensions shall be in accordance with the lawful rules and regulations of the district and with the applicable State of Wisconsin plumbing and sewerage codes.

3. That if construction of the sewer extensions covered by said plans has not commenced within four years following the approval date of this resolution, this approval shall become void and new plans shall be submitted. If construction has commenced but has not been completed within the four-year approval period, the unbuilt portion must be submitted for reapproval if it is a significant portion of the project and would require DNR approval.

The above resolution was adopted by the Commissioners of the Madison Metropolitan Sewerage District at their meeting held at the district on March 14, 2019.

MADISON METROPOLITAN SEWERAGE DISTRICT

    Attested by:

________________________________  ________________________________
Thomas Hovel, President         Angela James, Secretary
## Agenda Topics

### 03/14/2019

**Commission Meeting and Retreat 8 a.m. until 12 p.m.**

#### Consent
- Approval of Minutes 02-28-2019
- Operating and Capital Funds Cash Statements
- Expedited Boundary Annexation 2019-04 LB Lands Parcel (City of Verona) – *Sauser*
- Review and Approval of Sewer Extension Plans – *Sauser*

#### New Construction Projects
- First Addition to 1000 Oaks - Phase 7, City of Madison
- Woodland Crest, Village of Waunakee

#### Reconstruction Projects
- South Bryan Street, Daley Drive, James Street and Thorp Street Reconstruction District - 2019, City of Madison
- Williamson Street and East Wilson Street Assessment District – 2019, City of Madison
- Haywood Drive Reconstruction Assessment District – 2019, City of Madison
- Groveland Terrace Assessment District – 2019, City of Madison

#### Topics
- Election for the Commission Secretary Position and Appointment of a Commissioner to the CED Performance Review Subcommittee – *Mucha*

#### CED Update
- Chief Engineer and Director’s Report – *Mucha*
- Regulatory/Legal Review – *Kent*

### 03/28/2019

#### Consent
- Approval of Minutes
- Review and Approval of Sewer Extension Plans – *Sauser*
- Annual digester cleaning – *Dundee*
- Annual vehicle replacement – *Dundee*

#### Topics
- Energy Master Plan – *Seib*
- Study Session: Long-Term Financial Strategy – *Walker*
- Review and Award of Design Phase Engineering Services for Pumping Station 17 Force Main Relief Phase 1 – *Eric Hjellen*
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<td>➢ Operations Report – Grooms</td>
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<td>➢ Acceptance of Work: Southeast Interceptor Rehabilitation Upstream of Pumping Station 9 – Hjellen</td>
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<td>➢ 2019 Final Clarifier 17 &amp; 19 Coating Project – Lessner</td>
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<td>➢ Review and Approval of Sewer Extension Plans – Sauser</td>
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<td>➢ Project Update: Liquid Processing Improvements – Phase 1 - Klawes</td>
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<td>➢ Approval of First Quarter Sewer Service Charges – Gebert</td>
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<td>➢ Badger Mill Creek Project Schedule and Planning – Griffin</td>
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<td>➢ Review of Bids and Award of Contract for Northeast Interceptor Truax Extension Relief – Hurlebaus</td>
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<td>➢ Annual pavement replacement – Lessner</td>
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<td>➢ Annual clarifier coating – Lessner</td>
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<td>➢ Long-Term Financial Strategy Process Approval – Walker</td>
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**Tentative:** Commissioner Tom Wilson
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<td>09/12/2019</td>
<td>Approval of Minutes, Operating and Capital Funds Cash Statements, Review and Approval of Sewer Extension Plans – Sauser</td>
<td>Presentation of Proposed 2020 Operating Budget and Capital Projects Budget – Brochtrup</td>
<td>Chief Engineer and Director’s Report – Mucha, Regulatory/Legal Review – Kent</td>
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<td>Approval of Minutes, Operating and Capital Funds Cash Statements, Review and Approval of Sewer Extension Plans – Sauser</td>
<td>Deliberation and Direction on 2020 Operating Budget and Capital Projects Budget – Brochtrup, Approval of 3rd Quarter Sewer Service Charges – Gebert</td>
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<td>Approval of Minutes, Review and Approval of Sewer Extension Plans – Sauser</td>
<td>Review and Adoption of 2020 Operating, Capital Projects and Debt Service Budgets – Brochtrup, Review and Adoption of 2020 Sewer Service Charge Rates and</td>
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**Topics**
- Energy Master Plan – Dundee

**CED Update**
- Chief Engineer and Director’s Report – Mucha
- Regulatory/Legal Review – Kent
- Operations Report – Grooms

**ICEBOX:**
- Brief presentation demonstrating the power and business value of our new ESRI tools
COMMISSION AGENDA REPORT
March 14, 2019
Strategic Planning Preparation

Lead Staff: D. Michael Mucha, Chief Engineer and Director

Requested Action: Receive information to prepare for strategic planning.

Attachments:
Attachment 1: Summary of 50 Year Master Plan
Attachment 2: District’s Strategic Plan
Attachment 3: The Water Resources Utility of the Future...A Blueprint for Action
Attachment 4: Twelve Promises of Suncheon
Attachment 5: Global Outcomes Policies
Attachment 6: Watershed Map

Financial Impact:
The strategic planning process complements long-term budgeting and master planning efforts.

Background:
The commission will be conducting strategic planning during two half-day sessions, one in February and one in March.

The district has a long history of strategic planning.

50 Year Master Plan
In 2009, the district completed a 50 year master plan. The plan provided general guidance for service over the next 50 years. Key areas that were evaluated included:

- Collection, conveyance and treatment capacity/condition
- Decentralized treatment and opportunities for regionalization
- Effluent discharge locations and impacts on stream base flows, inter-basin transfers and conservation of groundwater through reuse
- Biosolids management
- Stormwater management
- Agriculture waste management
Attachment 1 includes a master plan summary including a series of recommendations from white papers prepared by district staff.

**Operational Strategic Plan**
A document, referred to as “the pillars,” outlines the mission, vision, strategies and projects that are necessary for the district to achieve its outcomes over time. The plan is updated annually by the chief engineer and director in consultation with the executive team and assumes a three to five year planning horizon. It is used to propose projects in the budget and capital improvements plan. The pillars document is included in attachment 2.

**Analysis and Alternatives:**
In 2013, a broad cross section of water industry leaders arrived at a shared realization that the challenges and opportunities faced by wastewater agencies are unprecedented and that some of the practices that have been in place for decades must change. Attachment 3, “The Water Resources Utility of the Future...A Blueprint for Action” presents the clean water industry’s vision for the future as well as a series of tactical considerations that will move utilities forward.

Thanks to past planning efforts, the district has shown foresight and has already taken proactive steps on many of the suggestions in the blueprint. Yahara WINS, Ostara and asset management are examples of active initiatives.

Keeping an eye toward the future is an important role of the commission as identified in the commission policy book, which encourages the commission to regularly think “upward and outward.” Conducting strategic planning is one means to fulfill this role and is the primary goal of the strategic planning process.

The focus question for strategic planning is:

*Looking out 20 years, what should the district pursue to assure we continue to meet the needs of our customer communities and rate payers?*

The answers to this focus question will be in the form of ideals. Ideals are the next level of clarity down from vision, but broader and more forward looking than the mission. Ideals describe commission members’ shared desires for what is possible to meet the needs of our customers. While the district has a long history of strategic planning, the commission has never engaged in this level of strategic thinking.

Attachment 3 includes a document called the “Twelve Promises of Suncheon.” This document is a wonderful example of what a compelling statement of ideals looks like. In the first few pages, it vividly describes a future state for a City in Korea called Suncheon. Unlike other strategic planning efforts that come from the head, this comes from the heart.

The power and utility of ideals cannot be over emphasized. People move toward what they love and care about. That is a feeling, not a business case. Well-described ideals will:
• Bring our customer communities and partners to the table to confront difficult challenges because they feel that they belong and can contribute
• Attract employees who want to contribute to something bigger than themselves
• Retain employees who are motivated to innovate, grow and learn on the job
• Bring stability because change occurs at a pace consistent with workload obligations and constraints

Ideals are not a long list of new priorities or a dramatic change in direction. Ideals build on the good work already done and may signal to staff new or modified considerations in the operational strategic plan.

**Next Steps:**
Strategic planning will conclude on March 14, 2019. Dress comfortably because there will be a lot of moving around and breakfast will be served.

1 Outcomes outlined in the policy book of the district commission
MEMORANDUM

From: Michael E. Simon

To: Michael Mucha

Subject: Master Plan Summary and Follow-up

Date: June 24, 2011

The District initiated a master planning process in the summer of 2007 and completed the finishing touches in December of 2009. The intent of the process was to provide a long-term (50-year) direction for the District’s facilities that would be updated from time to time as new information and new technologies become available, and as changes in regional policy or needs become apparent. This memo summarizes the recommendations related to the Master Plan and the white papers that preceded and helped to focus the master planning effort. It also provides thoughts and discussion regarding follow-up.

The Master Plan included direction related to the District’s collection system and plant facilities, and additionally, provided direction related to several areas of special interest to the District. Those areas of interest included, but were not limited to, the potential for satellite treatment facilities, the use of effluent as a resource, the potential for sharing of regional wastewater services, possible alternate discharge locations, and the mitigation of effects related to inter-basin water transfer.

Please note that the comment paragraphs (italicized), where added, reflect the author’s memory and opinions, and are subject to discussion and others’ memories and interpretations.
Preliminary Master Plan White Papers

Prior to the Master Planning process, District staff presented a series of white papers to District’s Commission. A summary of the white papers and recommendations follows:

1. Decentralized Treatment and Opportunities for Regionalization

This white paper discussed decentralized treatment and opportunities for regionalization. Commission policy would determine the degree to which the District pursues future agreements with neighboring municipalities. Any such agreements would address decentralized treatment to minimize costs for the municipality and for the District, and potentially mitigate inter-basin water transfers.

Related recommendations of white paper:

- The District should contact each of these communities to inform them of the upcoming planning effort, including the possible regional options that may be studied, offer to meet with them to discuss the work in more detail, and invite them to participate in the planning process.

- Based on the response from each community, structure the scope of services to be provided by the consultant to reflect each community’s level of interest in the planning process.

- Communicate with each community during the planning process as necessary to keep them apprised of the status of the work and the plan’s conclusions and recommendations. If they have not been actively involved, encourage their greater involvement if a regional alternative involving their community appears to offer a good regional solution that could benefit both the District and the community.

COMMENT: During the Master Planning process, the District met with the communities of Oregon, Stoughton, and Sun Prairie to discuss the potential for future regional collaboration related to the provision of wastewater services. Depending upon the community, one or both of the two following possible alternatives for shared services were discussed with each community. The community could join the District and the District would operate and maintain the community’s wastewater treatment plant or the community could maintain ownership but provide services for some of the District’s customers and potentially vice versa, i.e., the District could provide services for some of the community’s customers where it made sense to do so. None of the three communities was particularly interested in joining the District or in pursuing future service agreements at the time of the Master Planning effort.
2. **Effluent Discharge Locations and Impacts on Stream Base Flows, Inter-Basin Transfers, and Conservation of Groundwater through Reuse**

This white paper discussed policy issues related to potential discharge locations for effluent from treatment plants and analyzing the impacts the discharge locations might have on stream base flows, inter-basin water transfers, and conservation of groundwater through effluent reuse. Commission policy would determine the approach the District uses and the scope of the effort in preparing the Master Plan.

Related recommendations of white paper:

- The District is best served by continuing to act in a proactive manner and should proceed with the Master Plan, including evaluations of various alternatives for returning effluent to the watershed upstream of the Madison lakes, to streams tributary to the lakes, and directly to the lakes. The plan should also recommend which, if any, of the alternatives should be pursued and include those that make the cut in a ranked hierarchy that would reflect cost, acceptability, constructability, operability, effectiveness, and other issues of importance to the District and the community. The plan should also include an implementation schedule that would reflect both tasks and milestones that are controllable and in the purview of the District and those that are controlled by others.

- The District should actively seek input from the DNR, the Dane County Lakes and Watershed Commission, and the new regional planning commission when evaluating alternative discharge locations and practices. The District should also involve the Dane County Land Conservation Department and the affected stormwater utilities when the alternatives could affect their areas of responsibility.

- The District should form a technical advisory committee to aid in the development and screening of alternatives. The advisory committee should include representatives from the DNR, the Dane County Lakes and Watershed Commission, the new regional planning commission staff, the Dane County Land Conservation Department, the City of Madison Stormwater and Sewer Utilities, the UW Limnology Department, and the UW Civil and Environmental Engineering Department.

- The District should develop a public education and information program to communicate with the public during the planning process. This program would include public information meetings and a project website. This effort should also attempt to gain comprehensive coverage from the local newspapers and TV and radio stations.

*COMMENT: The Master Planning Process generally followed the recommendations in the white paper. The District actively sought input from interested regional groups and*
formed a technical advisory committee (TAC). The results of the process are included in the Master Plan Recommendations section below.

3. Biosolids Management

This white paper discussed policy issues related to biosolids management and provided focus in developing the scope for the Master Planning process.

Related recommendations of white paper:

- Decisions relative to biosolids management should be consistent with the District’s 2002 biosolids management policy. This policy states that the District will pursue beneficial biosolids reuse options that protect human health and environmental quality, are cost effective, and provide flexibility with respect to end use. It is recommended that the policy statement be revised to clarify that flexibility/diversification will be accomplished by developing and implementing more than one biosolids reuse option.

- In the short term, flexibility should be achieved by continuing to recycle biosolids to agricultural land through the Metrogro Program, and developing a soil like product(s) for use in non-agricultural markets. Agricultural land application could involve application of biosolids in a liquid and/or cake form. The relative distribution of biosolids between the agricultural and non-agricultural programs should be driven by cost and market considerations. This may result in more than 25% of the biosolids production being used to produce MetroMix or similar soil like products. For the Metrogro program to remain a viable alternative, a minimum of 50% of biosolids production should be managed under this program. In the long term, periodic evaluation of biosolids management alternatives may result in one or both of the above programs being modified, reduced, or eliminated, if other options are identified that provide the desired flexibility at a lower cost.

- Partnerships with either the private sector or public sector agencies offer potential for significant cost savings. The District should thoroughly explore opportunities for partnerships through the solicitation of requests for proposals (RFPs). While cost is a factor that should be considered when evaluating RFPs, other factors are also important, including:
  - Experience in working with biosolids or similar products
  - Experience in developing and marketing topsoil or compost blends
  - Product distribution capabilities
  - Technical expertise of staff
  - Product quality assurance/quality control measures
  - Innovative approaches to product development
  - Level of anticipated District involvement
– Internal capacity to use the product(s)

- The District should always retain a small portion of MetroMix for distribution in a public pickup program. This will allow for additional market development and may provide the District with other viable management options should problems be encountered with a partnership. This strategy has been used successfully in Philadelphia.

- The District should have sole discretion in determining when the term “MetroMix” can be used to describe biosolids products. Use of the term should be limited to describe biosolids products developed directly by the District or products developed under a partnership where product performance has been fully researched and documented, and quality assurance/quality control measures are in place to ensure product consistency. The District should retain sole discretion in determining whether these conditions are met.

**COMMENT: In general, the recommendations contained in the white paper have been adopted as the District’s biosolids management strategy and policy. The intent of the MetroMix program is to diversify the District’s biosolids program, not replace, the MetroGro program. The Solids Handling Facilities Planning effort and the follow-up Eleventh Addition design and construction are intended to position the District with a more diverse market for its biosolids and to provide it with more flexibility.**

4. **Stormwater Management**

This paper discussed issues related to stormwater and stormwater management. State statutes include provisions for metropolitan sewerage districts to provide stormwater services. To date, the District has not been involved in this area. Regulations requiring higher levels of treatment for stormwater, and development of total maximum daily load allocations (TMDLs) that address both stormwater and wastewater effluents, will result in more District interaction with agencies currently responsible for managing stormwater. These circumstances may lead to a future role for the District in stormwater management.

Related recommendations of white paper:

- Current District policy (see discussion in the following paragraph) related to stormwater management has worked well. This policy should be relied on during both the TMDL process and the master planning work.

- The District’s present stormwater policy follows a 1997 memo from Jim Nemke to the District’s Commission. Based upon the recommendations in that memo, the District has used the following guidelines related to stormwater management:
− The District encourages and supports stormwater management efforts in the District’s service area.
− Individual municipalities are expected to take the lead in stormwater management initiatives.
− The District will only consider involvement in stormwater management if the following three conditions are met:
  - A stormwater problem with water quality implications requires a regional solution, and
  - The involved municipalities are unable to implement a coordinated plan, and
  - There is a consensus that the District is the appropriate agency to deal with the issue.

COMMENT: Although the District strongly encourages, supports, and needs good stormwater management, the District feels that the best place for stormwater management to reside is still with the individual municipalities. The District will continue to support good stormwater management and practices, and will continue to communicate with regional stormwater groups and remain aware of good stormwater management practices. The District’s role could change if stormwater becomes more of a regional, rather than a local, issue, and if and as requested to do so.

5. Agricultural Waste Management

This white paper discussed the issues related to agricultural waste management. The District has not been involved in this area throughout its history. At the time of the white paper, animal waste management options were being evaluated by Dane County. Some options being considered involved treatment or management approaches similar to those used by the District for wastewater treatment and biosolids management. This may lead to a future role for the District in agricultural waste management.

Related recommendations of white paper:

− The District should not get involved in the day-to-day management of any animal manure treatment facility. This would clearly fall outside of the District’s core mission and statutory authority.
− The District may be able to provide intermittent emergency services related to the treatment of animal manure or full services to handle side streams from the treatment process. The following recommendations are made in this regard:
The District should initiate discussions with county staff to ensure that they and their consultant(s) are fully aware of the District’s issues and concerns related to potential acceptance of liquid manure and/or liquid side streams that might be generated by a regional animal manure digester.

The availability of treatment capacity for liquid manure (or manure supernatant) cannot be assured in the long term. However, the District should further assess its ability to provide treatment for these materials on an emergency basis.

The District should assess its ability to treat a liquid side stream from a digested manure dewatering process on a permanent basis. Acceptance of a liquid side stream on a permanent basis would require revision of the District’s policy statement on acceptance of wastes from outside of the District’s service area.

- Future evaluations of biosolids management options, including evaluations conducted as part of the Master Plan, should include at least a cursory look at the feasibility of enhancing the District’s biosolid products using animal waste.

**COMMENT:** At one time, the District was under consideration as a potential operator for the County’s manure digester operations. Although the District has experience with anaerobic digesters, animal waste management was considered outside of the core business focus of the District and outside of the statutory boundaries of metropolitan sewerage districts. Using the District’s existing facilities for animal waste was also considered impractical. The District supports the County’s manure management efforts and would provide operational help and expertise on a temporary as needed basis if asked to do so.

**Master Plan Recommendations**

The Master Planning Process resulted in a very high-level review of the District’s existing NSWTP facilities and collection system facilities. Follow-up plans are being developed based on and in conjunction with those reviews, i.e., Collection System Facilities Plan and Plant Asset Management Plan. In addition, the following conclusions and recommendations were made to address other issues that were the subject of the Process:

- **Sufficient capacity exists at the NSWTP through 2030, provided there are no significant regulatory changes that would require a higher level of treatment.**

**COMMENT:** If phosphorous/TMDL/nutrient regulations are met using brick and mortar facilities versus trading, additional facilities will be required and may be required to some degree even if trading is pursued. The related assumptions are that the average Plant flow will be roughly 50 MGD in 2030. The assumptions do
not address the Plant’s peak flow capacity, which may need to be addressed after Pumping Station 18 is constructed.

- **Sufficient space exists at the NSWTP for future expansion to serve the anticipated treatment needs through 2060.**

- **Alternative MP-1A, which reflects a continuation of the District’s current service model with no provision for additional effluent conveyance capacity to the Sugar River basin, achieves the lowest cost for providing wastewater conveyance and treatment service in MMSD’s westside service area. However, this alternative will not mitigate future inter-basin transfers of water between the Sugar River basin and the Yahara River basin.**

  **COMMENT:** The existing upper flow to Badger Mill Creek is 3.6 MGD. Effluent limits are based upon actual loadings rather than the quantity of effluent. Therefore, if the loadings are below the limits, the District could potentially pump more flow to the Badger Mill Creek under its present discharge permit; however, since the stated upper limit that the District has provided DNR is 3.6 MGD, the District should notify the DNR if it intends to exceed this limit.

At present, the District’s pumping system is pumping at 3.6 MGD and this roughly matches the flow being transferred from the Sugar River basin to the NSWTP. It is unclear if the District’s existing pumping system is capable of pumping much more than the present flow. If it is desired to do so, staff should determine the upper limits of the existing pumping system.

- **Alternatives MP-1B, MP-1C and MP-1D, reflect a continuation of the District’s current service model, but include pumping up to an additional 4.3 mgd of treated effluent to the Sugar River watershed to address the inter-basin transfer issue. The additional total life cycle costs to implement any of these alternatives would be $34 million assuming the current discharge limits to Badger Mill Creek and Badfish Creek stay unchanged.**

  **COMMENT:** Alternative 1-B is the simplest alternative and would just include additional pumping capacity installed at NSWTP. All the flow would still be discharged at the existing outfall and flow into Badger Mill Creek. The DNR had concerns with discharging a significantly greater amount of effluent to Badger Mill Creek.

  Alternative 1-C provides for a portion of the flow to the Sugar River basin to discharge directly into the Sugar River south of its confluence with Badger Mill Creek. A pipe and/or potentially a pumping station would be necessary near the existing discharge point to either allow a portion of the effluent to flow by gravity or by pumping to the Badger Mill Creek’s confluence with the Sugar River. The DNR’s main concern with this option, as with all options that would increase flow to the Sugar River, was with the chlorides content of the effluent.
Alternative 1-D, like Alternative 1-C, would provide for a portion of the flow to the Sugar River basin to discharge directly into the Sugar River; however, instead of the flow discharging south of its confluence with Badger Mill Creek, it would discharge into the upper Sugar River. A pumping station would be necessary near the existing discharge point to allow a portion of the effluent to be pumped via a new force main pipe to the upper Sugar River to the north and west of Verona. The DNR was opposed to any effluent discharge in this portion of the Sugar River.

- If mitigation of the inter-basin flow imbalance between the Sugar River basin and the Yahara River basin is determined to be necessary, satellite facilities in the Sugar River Basin may be favorable from both economic and non-economic standpoints to address west side conveyance capacity issues. More detailed cost and non-economic comparisons between alternatives with centralized treatment and alternatives with satellite treatment will need to be conducted since their life cycle costs and social and environmental benefits are closely ranked.

**COMMENT:** The District planned to conduct a Sugar River Treatment Plant facilities planning effort to determine the feasibility and cost of a treatment plant in the Sugar River. Two potential locations had been considered, one in the upper portions of the Sugar River and one south of Verona and its confluence with the Badger Mill Creek. The DNR had significant concerns and opposition to any effluent discharge in the upper portions of the Sugar River so that option was discounted. Further discussions with the DNR regarding a plant to be located farther south concluded that a plant in the Sugar River basin would most likely require cost prohibitive technologies to produce an acceptable level of effluent. The main concern included the level of chlorides in the District’s effluent.

**NOTE:** All options except for 1-A include discharging more flow to the Sugar River basin. The chlorides loadings represent an upper limit for effluent flow discharged to the Sugar River basin. Long-term, it is possible that the chlorides in the District’s effluent may be reduced; however, the District must proceed as if a Sugar River basin treatment will not be built since planning for collection system changes are significantly dependent upon this decision. In addition, most other factors besides energy, favored continued centralized treatment at the NSWTP and pumping to mitigate inter-basin water transfer. There is significant risk to assume a Sugar River treatment plant would be built in a timely enough fashion to address pending collection system deficiencies.

- **Watershed balancing should be an important planning variable for future projects.** Multiple planning alternatives could be implemented to mitigate inter-basin water transfers.

**COMMENT:** This has been a long-standing principle and concern of the District as is the diversion of effluent out of the Yahara basin. It is somewhat unclear if a
significant correlation exists between the diversion of deep aquifer groundwater from a watershed and the reduction of surface water flows within the watershed. This may be an appropriate subject for further research. The District’s intent has been to balance the diversion of groundwater from a watershed with like amounts of effluent discharged to surface waters within the same watershed. What is relatively clear is that the District’s effluent is generally viewed as a resource when used to mitigate stream flow deficiencies or where it has been established as a major part of the present day flow, i.e., Badger Mill Creek in the first case, Badfish Creek in the second.

- **Effluent reuse options should be evaluated during future facilities planning efforts, but will require partnerships to implement.** Partnerships could potentially include other municipalities, water utilities, or public/private partnerships.

**COMMENT:** Effluent reuse options have been and are being explored on an ongoing basis. The NSWTP uses a significant amount of effluent in its daily operations. The Plant’s effluent reuse system (W4) was installed as part of the Tenth Addition and it will be expanded upon in the Eleventh Addition. Additionally, Fitchburg’s Nine Springs Golf Course uses effluent to irrigate. This amount is tapped off the District’s Badger Mill Creek Effluent Force Main. In addition, the District has been working with Fitchburg and the UW on a project that would use effluent to recharge groundwater. This effort would also tap into the existing Badger Mill Creek Effluent Force Main.

Going forward, questions remain as to how aggressively the District should pursue partnerships for use of effluent. At one point, the District’s effluent was under consideration for use as cooling water for MG&E’s Walnut Street Generating Plant; however, MG&E and the DOA opted for the use of lake water instead. The District will continue to look for partnerships where they may exist and where the use of effluent is relatively cost effective; however, the District must also consider how aggressively it promotes effluent reuse and seeks partners interested in doing so.

- **Effluent discharge to Badfish Creek should continue, but the quantity could be impacted by watershed balancing and/or effluent reuse projects that decrease the amount of water that would otherwise have been discharged to Badfish Creek.**

**COMMENT:** The District does not plan to shut off its discharge to Badfish Creek anytime soon; however, the District may reduce its flow to Badfish Creek and should not plan to discharge higher amounts of effluent during storm events than it can now pump. The maximum discharge to Badfish Creek is limited by its effluent pumping system to about 75 MGD. During the Master Planning effort, the Friends of Badfish Creek were concerned with the concepts of less flow or no flow from the NSWTP going to the Badfish Creek. Again, effluent is viewed as a resource, not as undesirable.
• Due to the long planning horizon, specific effluent reuse projects cannot be clearly defined for long term alternatives. Preliminary evaluation shows that the most cost effective approach to providing effluent for reuse options is to continue to treat wastewater centrally and construct an effluent delivery system(s).

COMMENT: In addition to appearing less costly, continuing to treat wastewater at the NSWTP also appears to be the best option based upon non-economic factors and involves less risk at this time. It is difficult to assess whether the District will be able to meet the limits for discharge to the Yahara Lakes system or whether the public will be accepting of it. Other reuse options at specific points within the system are more expensive than continued centralized treatment, especially without knowing where effluent has the potential for reuse. Effluent delivery systems can be built when reuse conditions are known.

One potential option for “reuse” is to treat the wastewater to produce a high quality effluent and use it to supplement flow in the Yahara Lakes system, i.e., discharge to Lake Waubesa via the District’s drainage ditch to Nine Springs Creek. To meet high quality effluent limits, i.e., limits that would allow discharge to the lakes, a demonstration plant would be constructed at the NSWTP. The plant would potentially include sand and/or membrane filters to produce an effluent that meets low nutrient levels. The plant would be built as an expandable system.

• Reduction of inflow/infiltration (I/I) in the existing conveyance system is an important element for the areas that experience high groundwater during wet weather conditions. Effective I/I reduction could delay the need for major capital improvement projects required to expand the capacities of the conveyance system and treatment facilities. Therefore, programs to reduce I/I are recommended for all planning alternatives.

COMMENT: The District has addressed and will continue to address its collection system where I/I appears to be a problem. The District has periodically asked its customer communities to do the same where it recognizes a problem exists, which is as it did following the June 2008 storm event. However, in the future the District may need to take a more aggressive role in insuring that customer’s address their I/I issues where they are recognized by the District. This could potentially include partnering with customer communities to help address their problems. Any change in the District’s current approach may require shifts in policy and potentially, the District’s sewer ordinance.

• Future service alternatives such as satellite plants in the upper Yahara River basin that would discharge to the Madison lakes and regional service options involving Sun Prairie and Stoughton are not further evaluated in the Master Plan. At this time, the strict regulatory constraints, high construction and operation costs, lack of proven technology, and potential strong public resistance make these service alternatives less favorable than the services
provided under the current operating model. However, these alternatives may become more viable in the future with changes in the political environment, water resource demand, or improvements in wastewater treatment technologies.

COMMENT: The discussion regarding satellite plants and alternate discharges follows a discussion similar to effluent reuse options above, i.e., alternate discharge of effluent is essentially another reuse option. At present, given the constraints listed in the recommendation above, it is less risky to continue treatment at the Nine Springs Wastewater Treatment Plant and wait for “signposts” (see discussion below) that improve the odds of successful implementation.

- Signposts such as technology improvements, regulatory trends, population growth rate, population shift, and changes in water use should be closely monitored during the planning period to allow MMSD to make appropriate adjustments to the Master Plan. The Master Plan will be a dynamic document and should be reviewed and updated periodically to reflect the impact of these types of key factors.

COMMENT: The Master Plan should be visited periodically and its results and recommendations updated. The District will also continue to review its Collection System Facilities Plan (CSFP) and Plant Asset Management Plan (PAMP) periodically to assess the extent and limit of its existing facilities and determine where replacement, rehabilitation, or new facilities are required. The Master Plan is not intended to replace the District’s Strategic Plan; however, it should serve as a vital subset of the District’s strategy and it may generate or modify related policies. The District’s Master Plan addressed more than a typical Master Plan and did so in an effort to establish policy and facility direction for the next fifty years. Signposts (key indicators and factors) going forward will ultimately help shape and reshape that plan.

Follow-up to the White Papers and Master Plan

Several policy level decisions were made on the basis of the white papers that were written prior to the Master Planning effort. Should staff and the Commission review and/or reconsider any of those decisions on a periodic basis? Are there any that should be reconsidered at this time? Should the District meet periodically with other regional providers of wastewater services and/or providers of area stormwater services?

The District’s near term future related to facilities appears to be relatively clear at this time. The present path is that a Sugar River Treatment Plant will not be constructed and therefore, planning continues based upon centralized treatment and discharge of effluent to Badfish Creek and the Badger Mill Creek. Any change in that direction would
have to occur in the near future since a Sugar River plant and/or the related collection system alternatives will take a significant amount of time to plan, design, and construct.

One of the areas remaining less certain includes determining the extent to which the District should continue pursuing mitigation of inter-basin water transfer. If the chlorides loading places an upper limit on the amount of effluent that can be discharged in the Sugar River basin, a point will soon be reached where the District can no longer match the amount of water generated in the Sugar River basin with the amount of effluent transferred back to the Sugar River basin. When does this become a significant concern and is it a breach of the District’s present policy? To what extent should the District pursue a remedy to this issue and does the District need to revisit its direction on inter-basin water transfer?

The District’s present maximum pumping capacity to Badger Mill Creek is not known with certainty; however, the existing system flows do approach the maximum system capacity. The actual maximum capacity should be determined and the actual loadings at the system’s maximum capacity should be estimated. This will help provide an upper limit of flow for the existing system that can be compared with an estimate of the flow actually being transmitted from the Sugar River basin to the NSWTP. This would help determine an approximate timeframe when the amount of flow transmitted from the Sugar River basin exceeds the maximum flow that can be returned, which could in turn be used to decide when larger pumps might be required. All this is, of course, dependent upon the maximum amount that the District will be permitted to return to the Sugar River basin.

The District’s past practice has been to passively promote effluent as a resource and look for opportunities for effluent reuse. Is this the appropriate level of effort or should the District promote and pursue effluent reuse and alternate discharges more aggressively? Should the District actively pursue related public and/or private partnerships?

Infiltration and inflow have always been minor concerns of the District and it has modestly pursued infiltration and inflow reduction within its collection system. Are the District’s present practices adequate and what about concerns related to its customers’ collection systems? Should the District pursue I/I reduction more aggressively, to what extent, and is it cost effective to do so? Would such change require policy changes at the Commission level and/or changes in the District’s sewer ordinance?

Given the District’s planning related to phosphorous and potential nutrient regulations, the potential for trading could significantly affect the District’s facilities planning going forward. Not only could trading potentially eliminate or postpone the need for filtration facilities, but a demonstration plant that treats to low levels of nutrients for discharge to Nine Springs Creek may conflict with trading and adaptive management approaches, i.e., the need for a demonstration plant may no longer be seen as relevant if trading and
adaptive management approaches are pursued. Should the District still pursue research to determine the practical water quality limits of such a demonstration plant? Should other appropriate and related research be conducted, e.g., as related to the impacts of effluent on lake water quality? If so, what specific research should be conducted and when?

Lastly, what signposts (key indicators) should the District look for to determine when and if changes in direction or alternatives should be pursued? How often should the Master Plan be reviewed and updated? The recommendation suggested monitoring technology improvements, regulatory trends, population growth rate, population shift, and changes in water use. The District has typically remained cognizant of changes in its industry and technology. It has also remained involved in regulatory change and trends, and kept abreast of local changes in population, population trends, and other regional trends. In the future, the District must continue to be diligent in the aforementioned areas, and understand and determine when it may be wise to make changes in its direction or pursue different planning alternatives.

Next Steps and Priorities

The District’s Executive Team and other District staff as may be required should review the recommendations of the white papers and Master Plan to determine and set the priorities and next steps related to follow-up of the Master Plan. Policy issues that have relatively significant budget consequences and/or require Commission consensus and/or approval should be addressed first.

If any decisions regarding capital facilities need to be revisited, they will need to occur relatively soon if the result is to be included in the 2012 Capital Budget. The same is true regarding decisions to develop and/or implement any new initiatives or programs that require significant funding in the 2012 General Budget.

Potential Items for Discussion:

- Inter-basin water transfer
  - Future of Sugar River basin discharge
- Promoting effluent as a resource and effluent reuse
- High Quality Demonstration Plant
- Infiltration and Inflow
- Related Research
**Strategic Plan**

**OUR MISSION:**
To protect public health and the environment.

**OUR VISION:**
Enriching life through clean water and resource recovery.

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The Water Resources Utility of the Future: A Blueprint for Action
The National Association of Clean Water Agencies (NACWA), the Water Environment Research Foundation (WERF) and the Water Environment Federation (WEF) are pleased to release the *Water Resources Utility of the Future . . . Blueprint for Action*. Work on this document began in earnest in September 2012 and has been shepherded along by the strong efforts of a joint Steering Committee made up of three representatives from each of the three organizations as well as by a diverse Task Force of 49 experts representing a broad cross-section from the three organizations’ memberships. The Steering Committee ensured the *Blueprint* remained both targeted and comprehensive while the Task Force provided data, input, editing and insight throughout the drafting process.

This *Blueprint* was placed on a fast-track for finalization to ensure that Utility of the Future (UOTF) issues are front and center as the 113th Congress and incoming Administration develop their environmental priorities. The audience for this *Blueprint*, however, is broader than just federal policy-makers and includes local utility managers, private sector interests, state and local governments, and many others within the clean water, drinking water, energy and agricultural communities.

Our three organizations have different missions and strengths - these include advocacy, technical input, outreach/communications, scientific research, data collection and media relations. Each organization will cull from this document to determine which particular UOTF priorities to advance. Wherever possible, however, the three organizations will work together to advance shared objectives and will seek to encourage the array of organizations that make up the clean water sector to review this document closely and work to advance the UOTF objectives outlined in the *Blueprint* as well.

It is critical to understand that the *Blueprint* is a living document and that new ideas under the UOTF umbrella will continue to be added. This document represents an opening salvo in the effort to define and tie together a diverse realm of resource recovery activities and innovative approaches, many of which were never contemplated, and likely could never have been foreseen, 40 years ago when the Clean Water Act was enacted.

This project was advanced because a group of industry leaders arrived at a shared realization that the challenges (and opportunities) faced by wastewater agencies are unprecedented and that some of the paradigms
that have been in place for decades are changing to meet these challenges. This Blueprint underscores the need for the clean water sector to work together to shape the landscape of clean water going forward. It also highlights the type of collaboration that is needed to ensure a sustainable future that minimizes waste, maximizes resources, protects the ratepayer, improves the community, and embraces innovation in an unprecedented manner.

The joint Steering Committee and Task Force that did the hard work to make this Blueprint possible constitutes a model that is now in place not only for further joint efforts under the UOTF banner but potentially for other efforts that can advance the clean water sector’s lofty objectives. We sincerely hope you find this document as fascinating and useful to read as our organizations did creating it!

Ken Kirk
Executive Director
NACWA

Glenn Reinhardt
Executive Director
WERF

Jeff Eger
Executive Director
WEF
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The clean water paradigm in the US is changing. The Water Resources Utility of the Future (UOTF) will transform the way traditional wastewater utilities view themselves and manage their operations. They also will transform their relationships with their communities and their contributions to local economies. This Blueprint presents the clean water industry’s vision for the future as well as a series of actions that will help deliver our vision.

Today’s utilities have evolved and matured over decades. Originally technical engineering entities, utility managers now embrace sophisticated management approaches and have developed innovative finance capabilities. These institutions have accomplished many of their goals — they are operationally efficient collectors and managers of household and industrial wastewaters and protectors of the quality of the nation’s waterways. In recognition of these achievements, these utilities are increasingly renaming themselves “Water Resources Recovery Facilities” or “Clean Water Agencies.”

The most progressive of today’s clean water agencies are defining the UOTF. Instead of solely collecting and transporting wastewaters as far downstream as possible to central treatment plants where wastes are cleansed to meet permit limits prior to discharge to waterways, the UOTF transforms itself into a manager of valuable resources, a partner in local economic development, and a member of the watershed community seeking to deliver maximum environmental benefits at the least cost to society. It does this by reclaiming and reusing water, extracting and finding commercial uses for nutrients and other constituents, capturing waste heat and latent energy in biosolids and liquid streams, generating renewable energy using its land and other horizontal assets, and using green infrastructure to manage stormwater but also to improve urban quality of life more broadly.

These actions benefit the utility in the form of reduced costs and increased revenues. But they also deliver environmental, economic, and social benefits both locally and nationally:

Because we have examples of these sorts of innovations and outcomes, it is tempting to conclude that no further action is needed. Indeed, there are signs that the market for innovation in the clean water sector is beginning to bear fruit after many years of trial and error. But, resistance to change is strong, reinforced by
regulatory pressures, strained utility budgets, political reluctance to raise rates, customer confusion about the benefits of innovation, skyrocketing demands for capital competing for every dollar, risk and regret associated with technology failure, and venture capital looking elsewhere for faster and safer returns.

This Blueprint for Action examines these barriers, suggests incentives for innovation, and compiles a series of actions that could change the dynamics of this industry. It asks the US Congress to take a major role legislatively to assure that the Clean Water Act and other authorizing statutes fully support public and private enterprises across the clean water industry as they make the transition to the UOTF. Some actions call for legislative or regulatory changes to sanction watershed-based solutions to the nation’s biggest water quality challenges. These would enable all sources of water quality contaminants to work together on socially cost-effective, market-based solutions while respecting the regulatory framework that has served us well for decades. Other actions call for modest changes to encourage water reuse and water conservation where it is feasible, needed, and cost-effective and for similarly incremental changes to enable clean water agencies to fully recover waste heat and energy and to produce clean, renewable energy at their facilities.

Other actions address financial and risk allocation conventions: focusing disparate federal financial support programs on UOTF objectives; maximizing efficient water use and reuse for new government buildings where it is environmentally and economically feasible to do so; stimulating the pace of technology innovation with a new advanced research and development program for clean water; and implementing pooled risk-sharing strategies and reciprocity for technology approval across the 50 states, both aimed at boosting adoption rates for new technologies.

Still others call for institutional or programmatic changes that for the most part, the clean water sector itself can implement working more closely with other municipal leadership and in some cases, state and/or federal regulators. Stronger support for Green Infrastructure from within the sector could help go beyond cost-effective stormwater control to frame a broader conversation about fundamental urban design. New models for integrated watershed planning would engage the public, civic leadership, drinking water utilities, and infrastructure
professionals to make better decisions.

Finally, the Blueprint makes a strong case that clean water agencies must continue to strengthen their institutions though productivity improvement processes/decision support tools such as Lean, Six Sigma, and sustainability-driven environmental management systems. The UOTF will increasingly use social media and smart technology to interact with customers and deliver services more efficiently. It will standardize operator certification to create a better trained and more mobile workforce. These approaches help ensure that the sector performs at peak levels so that external resources will have the greatest impact.

There should be little doubt that all of these changes to the status quo can have profound results. But the world around us will change even as we change our own sector. This Blueprint, therefore, also calls for bold, transformational thinking and cooperation in our advocacy, in research and development, and in education and outreach efforts. To shape the future, the Blueprint calls for creation of a Congressional caucus where water sector experts can collaborate with legislators to help drive UOTF initiatives and craft a 21st Century Watershed Act that builds on 40 years of Clean Water Act achievements but embraces UOTF initiatives more fully. As well, the Blueprint calls for an intergovernmental solution to improve the resilience of our infrastructure and our communities in response to extreme weather events like Hurricanes Sandy, Irene, or Katrina. It asks professional organizations that represent the clean water industry to work together to create the “Industry of the Future,” notably, by compiling a knowledge base of UOTF achievements and by working with the Environmental Protection Agency (EPA), other federal agencies, and the US Congress to implement key elements of this Blueprint. And, it calls on the states to develop or support water markets that address long- and short-term shortages in the face of drought.

At this early stage, we cannot fully envision the limits to this new paradigm. But, we do know that each clean water agency will take a somewhat different path from handlers of wastewater to managers of sustainable resources; from regulated entities seeking permit compliance to watershed-scale environmental leaders seeking least-cost/highest return environmental and social solutions; from engineers designing concrete and steel treatment works to regional planners designing and building weather-resilient, green communities; from isolated public service units to integrated members of economically thriving local economies.

This Blueprint for Action defines tangible steps — actions we can take as a nation to realize our vision.
Evolution of Today’s Clean Water Utility

Urban sanitation in the US has evolved from the 18th century norm of dumping human waste in the streets, through the era of sewage collection but little treatment from the mid-1800s through the early-1900s, to early treatment efforts of the early to mid-1900s, to the Clean Water Act era of federal intervention requiring secondary or greater treatment following the Act’s passage in 1972. According to a recent poll of 11,341 readers conducted by the British Medical Journal, the advent of modern sanitation — collection and treatment of human wastewater prior to discharge — was the single most important public health advance of the last two centuries.¹

The institutions that managed this transition have similarly evolved. In the very early years, sewer companies were nearly all owned and operated privately. As cities realized that modern sanitation held the key to a healthy population and economic growth, governments stepped in to expand collection networks. City public works departments that added rudimentary treatment to help clean up America’s waterways from raw sewage discharge eventually became city sewer departments. Over the first couple of decades following Clean Water Act mandates for both greatly enhanced treatment and increasing financial sophistication, many city sewer agencies transitioned into public, but generally larger, regional and often independent authorities with broad technical, financial, legal, and management mandates. Not surprisingly, utility leadership diversified to include lawyers, economists, scientists, and management experts as well as engineers.

Today, America’s urban clean water agencies are among the most sophisticated and effective utility organizations in the world. They deliver services to more than 90 percent of the US population; their operations affect nearly every river, stream, lake, estuary, and coastal waterway in the US; they manage more than $500 billion in net depreciated assets; they finance about $25 billion a year in capital investments; they manage a combined budget of more than $55 billion a year.² They remove more than 90 percent of organic inputs, an estimated 55 percent of nutrients, and nearly all harmful bacteria.³ Environmental outcomes are equally impressive — according to EPA and state analyses, municipal wastewater discharges account for less than 10% of remaining water quality impairment of the nation’s rivers, streams, lakes, reservoirs, and coastal shoreline and only about 30% of impaired estuaries.⁴
The Utility of the Future: A Blueprint for Action

The public health and environment-based model of the “traditional” wastewater treatment utility that evolved over the last 150 years has had as its principal objectives, to collect and transport human and industrial wastewater quickly and as far downstream as possible to central treatment works that could purify it sufficiently and cost-effectively so that when discharged, receiving waters would meet applicable environmental standards.

Defining the Utility of the Future: A New Model Is Emerging

While traditional public health and environmental protection will always be central, the model for the utility of the future (UOTF) is evolving in new directions. It contemplates a new business approach where instead of simply collecting, treating, and disposing of municipal and industrial wastewater, the UOTF recognizes that its inputs are valuable resources. As such, its objectives are to separate, extract, reuse, or convert valuable water, energy and commodities from wastewater while using utility assets in innovative ways to reduce costs, increase revenues, and strengthen the local economy. The UOTF also seeks to engage more fully with others that share the water resource through watershed-based approaches, innovative partnerships and adaptive management techniques to ensure that actions maximize environmental benefits.

This is no longer an aspiration. With the help of technology developers, innovative US clean water agencies are beginning to take these steps today.
The nation’s clean water agencies are becoming more energy and operationally efficient, recovering energy from biosolids, reusing effluent and biosolids, recovering nutrient and other constituents, transforming waste streams into valuable new commodities, taking steps to support economic expansion by setting capital investment priorities to meet the needs of industry, and working collaboratively with other water quality interests within their watersheds.

The Business Case for Action: Why Utilities Are Transforming Themselves

Part of the explanation for why clean water agencies are increasingly taking these actions lies in the natural evolution of the institutions as introduced earlier — after decades of experience, utilities simply have done a good job at meeting traditional objectives. Utilities also realize that for some constituents including nutrients, mercury, and emerging pollutants, the most effective environmental solutions and the most cost-effective solutions for the communities they serve increasingly involve others outside their direct control.

At the same time, we are reaching the limit of traditional sources of urban water in many areas, especially in the arid West; real costs of energy are rising steadily; and local budgets are stretched thin as utilities cope with political reluctance to raise rates even as costs of asset replacement and advanced treatment are escalating. In some cases, customers have limited ability to pay more for wastewater services. As a result, one of the key drivers is financial. Utilities that undertake transformative measures toward the UOTF, from treatment and disposal of wastewater to sustainable resource management, generate from their own perspective, net benefits in the form of reduced costs and increased revenues.

Importantly, these actions also result in benefits to the environment, the communities they serve, and both local and the national economies (see the exhibit below). Fewer residuals are released into the environment. Those that are released are generally in a more benign form. Many UOTF elements capture methane, a powerful greenhouse gas that would have been released to the atmosphere. Clean water agencies that substitute their own renewable forms of electricity for purchased electricity from carbon-based fuels reduce CO₂ emissions. Utility savings are passed back to the community in the form of mitigated rate increases and investments to strengthen service delivery and environmental quality.
### Example Innovations
- Energy efficient equipment & networks
- Photovoltaic installations
- Wind turbine installations
- Methane production from biosolids
- Hydrogen production from biosolids
- Recovery of heat
- Hydroelectric energy recovery
- Supply of treated effluent for cooling
- Recharge of effluent to groundwater: efficient for landscape, golf course irrigation
- Ammonia recovery
- Phosphorus compounds recovery
- Nitrogen compounds recovery
- Metals recovery (Li, Mn, Zn, Au, Ag)
- Bioplastics production from biosolids
- Pyrolysis of biosolids to fuel oil
- Algal biomass fuel production
- Biosolids: solid fuel to replace coal
- Biosolids fertilizer pellets & soil conditioner
- Use of biosolids slurries as liquid fertilizer
- Upgrades & expansions to accommodate industrial and housing development
- Managed package plants to replace septic systems
- Implement Non-Point Source controls within watershed
- Green infrastructure for wet weather flows
- Convert community bio-waste to electricity

### Environmental Effects
- Reduced consumption of fossil fuels
- Reduced greenhouse gas emissions
- Reduced air pollution
- More fresh water for higher valued uses
- Less salt water intrusion
- Reduced discharges to cleaner waterways
- Reduced loadings to cleaner waterways
- Healthier ecosystems
- Less landfilling
- Less mining and burning of fossil fuels
- Reduced net carbon emissions
- Less groundwater contamination
- Less seepage overflow to waterways
- Reduced nutrient loads to waterways
- Reduced landfill demand
- Reduced methane emissions

### Utility Effects
- Reduced energy demand
- Reduced operating costs
- Reduced imports/better trade balance
- Enhanced investment in R&D
- Creation of technology jobs
- Increased household incomes
- Increased local GDP
- Increased local tax receipts

### Regional Economic Effects
- Reduced imports/better trade balance
- Enhanced investment in R&D
- Creation of technology jobs
- Increased household incomes
- Increased local GDP
- Increased local tax receipts
- Creation of new revenues
- Reduction of biosolids disposal costs
- Stronger community partnerships
- Reduced electric bills
- Increased treatment fee revenue
- Reduced grease sewer blockages
Local economies and in many cases, the national economy also benefit (these effects are illustrated in the graphic above). Reduced costs and increased revenues passed back to households and businesses create more disposable income, which can be reinvested in local goods and services. Business will have more capital to reinvest in plant and equipment as well as research and development. Part of this investment ends up creating new jobs in the technology and manufacturing sectors, which creates demand for new housing and other goods. As a result, governments enjoy growing tax receipts. Nationally, energy savings reduce imports and support a healthier balance of trade. Locally, utilities enjoy a dividend from these value dynamics as they come back to the utility in the form of increased demand and higher revenues.

Non-potable wastewater reuse (for industrial cooling, toilet flushing, landscape irrigation, fire fighting, and ecological enhancement), while still in its infancy, is increasing rapidly and offers cost-effective solutions to stressed regional water supplies in the West and in rapidly growing regions in the Southeast. Water reuse builds on the success of water conservation programs, which have allowed utilities to better manage infrastructure expansion needs. While non-potable wastewater reuse has doubled over the last decade to about 2 billion gallons a day, this represents only about 5 percent of total municipal wastewater discharged, according to the WaterReuse Association. Where water scarcity threatens local economies or community stability, reuse offers “water independence” and greater local control of future economic growth. Locally generated electricity has similar benefits to communities that depend on fragile generation or transmission infrastructure for their supply.

US clean water agencies are increasingly engaging within their service areas as both public health and economic development leaders. Some activities are routine — coordinating with local and state highway agencies to replace sewer pipes when roads are being rebuilt or with telecommunications companies to lay fiber optic cable to under served areas when sewer lines are open for repair or replacement. Similarly, clean water agencies often work very closely with economic development agencies and real estate developers to furnish new or expanded services to potential entrants. Increasingly, public wastewater authorities are partnering with technology developers and solution providers to develop renewable energy, nutrient recovery, wastewater reuse, and operational efficiency projects. Similarly, clean water utility managers are increasingly taking the lead in watershed-scale management initiatives that address both water quality and water use.
A Vision for the Future

While it is clear that America’s clean water agencies are emerging in the direction of the UOTF, the pace, depth and breadth of this transformation remains unclear. As is the case at any fundamental turning point, many believe that we are unable to imagine today the extent to which utilities could eventually innovate if faced with the right supportive conditions.

Discussions of innovation often include elements like the amount and quality of research; adoption rates and risk sharing; cooperation between academic, public, and private institutions; institutional leadership; workforce education; R&D funding and access to venture capital; protection of intellectual property rights; and market forces and competition. Indeed, many of these are relevant to the US clean water sector. In terms of what may be needed to create optimal conditions for innovation, sector leaders can point to many incremental changes within the industry and across the legislative, administrative, financial, and institutional environments in which they operate. Some envision bold new directions for their organizations — new models for highly efficient, community-based delivery of public health, customer service, and technology development.

The UOTF will be more distributed, automated, and circular. Reuse facilities, for example, are likely to be distributed because it will make little economic sense to reuse wastewater after it is transported long distances downstream to centralized facilities and pumped back upstream to points of application. Significant savings in energy, infrastructure replacement, and maintenance are possible with distributed, local reuse for cooling or landscape irrigation. Automation and controls, web-enabled mobile devices, and cloud computing will help drive this transition and, more generally, enable unattended operations linked to central control rooms that monitor operations, adjust processes in real time, communicate with customers, and manage the entire commercial process. UOTF processes will be circular in the sense that water, nutrients, solids, heat, energy, and other constituents will be reused and not discarded.

The UOTF will be greener and more involved with others within its watershed. Green as a result of energy efficiency and generation of renewable energy, but also greener in terms of the design of facilities and the choices of solutions, especially green infrastructure — natural land-based solutions in place of concrete and steel containment and treatment structures — to manage stormwater. Working with others at the watershed scale will enable clean water agencies to implement water quality solutions that save them and their communities’ money while preserving valuable resources for their most productive uses, including for example, partnering with drinking water utilities on conservation to reduce sanitary wastewater and expansion of wastewater...
Enabling Innovation: What It Will Take to Realize the Vision

Fundamentally, innovation in the clean water sector is already taking place because it’s good for the utility, the environment, the community, and the economy. The market is working, but at a slow and unpredictable pace. Left to evolve on its own, we might imagine a future where economic, environmental, and social forces drive a slow and bumpy transition to the UOTF. Relatively modest changes to current conditions would drive this transition more predictably to more locations, large and small, across the nation.

To effect the transition, utility leadership and management will have to continue, if not escalate their own programs that deliver continuous improvement in operational efficiency. External changes also are needed, however, to enhance incentives and reduce barriers that exist within legislation, regulations, administrative policies and priorities, finance and risk management conventions, and institutional partnerships.

In a 2012 survey of 62 medium and large clean water agencies, “project financing” and “regulatory concerns” were the two most frequently cited barriers to successful implementation of UOTF activities. Technology risks were a close third. Among the least cited barriers were management reluctance, customer acceptance, and legal authority to take the sorts of UOTF actions described above. A few utilities said availability of land would prevent them from taking certain UOTF actions, such as installing solar photovoltaic farms or wind turbines. The following section explores the most prevalent of these barriers and proposes actions to mitigate them. It also examines ways to provide incentives for technology innovation and broader adoption across the sector.

UOTF Opportunities Available to All Size Utilities

Simple process and equipment changes that cost about $1 million generated about $50,000/year in energy savings in Mukilteo Washington’s 2.6 mgd facility.

Less than $15,000 in advanced instrumentation and controls netted more than $9,000 in annual energy savings at the Bartlett Tennessee wastewater plant.

The clean water utility serving Cascade Wisconsin (population: 706) is powered 100 percent with renewable energy from two 100 KW wind turbines, generating $30,000/yr in energy savings (12.5 year payback) and reducing carbon emissions by 200 tons a year.

The 2 mgd clean water utility in Essex Junction Vermont recently installed two 30 kilowatt methane-fueled micro-turbines to generate its own electricity from biosolids. In this combined heat and power (CHP) project, waste heat offsets the cost of fuel needed to heat its anaerobic digesters. With total energy savings of $33,000 a year, the project has a 7.84% IRR and reduces CO2 emissions by 30 tons a year.

The Gloversville-Johnstown NY wastewater facility serving 25,000 residents and 12 local industries generates 90% of its energy needs in its anaerobic digester processing biosolids from the plant plus local dairy wastes. It saves $500,000 a year in energy costs and nets $750,000 a year in additional revenue from dairy waste acceptance fees.
Today’s clean water agencies operate within a complex environment of legal, institutional, and financial forces that taken together, influence utility decisions. By using these forces to provide the right incentives and remove unnecessary barriers to innovation, the nation can help utilities be better stewards of the environment and suppliers of public health services. These actions can mitigate risk, strengthen project feasibility, and stimulate technology advancement with minimal resource commitments that generate high rates of economic, environmental, and social return. In short, by re-examining current policies from the perspective of the UOTF, we can further enhance environmental and public health outcomes while enabling emerging objectives like resource recovery, water reuse, energy efficiency, and sustainable communities.

This section suggests key changes to:

- Legislation and Regulations,
- Institutional and Programmatic Practices,
- Financial and Risk Management Conventions, and
- Utility Leadership and Internal Management Approaches.

Each of these areas will be explored subsequently in this section. Options and suggestions are drawn largely from the experiences of clean water agency practitioners, technology suppliers, academics, and industry analysts that have participated in this initiative. The intent is to be indicative, not categorical, so options should be taken as examples. This is a long-term transition and requires a long-term commitment at all levels.

**Legislative and Regulatory Actions**

Among the many factors that will affect the types of UOTF activities that clean water agencies will pursue and why they will pursue them, none will be more important than the regulatory environment. In the same survey mentioned above, eight out of ten clean water agency managers said regulatory inflexibility is “very important” or “the most important” factor that needs to change to create more innovation in the sector.”
Key legal or regulatory actions include:

- Watershed-based processes and integrated approaches designed to deliver enhanced water quality outcomes at lower total social costs,
- Elimination of unintended barriers to widespread innovation on utility-scale energy recovery and generation, and
- Integration of water reuse into wider regional water supply solutions while managing public health risks and costs to all water users.

Given the key role that the US Congress will play in helping clean water agencies transition to the UOTF and today’s fiscal realities, it seems logical that the industry advocate for a Congressional Caucus on the UOTF (see page 30 for details). Not only would it raise awareness among legislators, but it would elevate the importance of water to our society and ensure that the federal government is doing everything it can to support the industry. A Congressional UOTF Caucus also would enable the industry and regulators to interact regularly with federal legislators to sort through the issues and set priorities.

Watershed-Based Water Quality Solutions. After 40 years of ever-increasing regulatory pressures on US clean water agencies, most of the easy and cost-effective solutions are already in place. Achieving further reductions in pollutant loadings from wastewater treatment plants will be disproportionately expensive relative to potential gains in ambient water quality or relative to the cost of achieving the same or in many cases, far better ambient water quality, by addressing unregulated sources of pollutants or other forms of water quality impairment.8 This suggests that from a community or broader social perspective, everyone would be better off if the Clean Water Act (CWA) and state equivalents formally encouraged processes that would enable local innovation around least-cost watershed scale water quality solutions rather than less effective, efficient, and equitable solutions because of their enforceability under current law and administrative practice. Following are examples of legislative and regulatory actions that would promote watershed solutions. Continued analysis of these and other watershed matters is needed, however, as more utilities participate in watershed-scale programs.

Total Maximum Daily Load Process. When effluent standards based on conventional wastewater treatment technology under the Clean Water Act are unable to produce ambient water quality that meets criteria for designated uses of the receiving water, the Act provides the states and EPA authority to establish a Total Maximum Daily Load (TMDL) for the pollutants of concern from all sources so that criteria will be met. States then allocate loadings of this pollutant to all point and nonpoint sources in the watershed. But since only point sources are regulated, the TMDL process must rely on voluntary actions to control non-point sources, which are some-...
times subsidized through various state and federal grants. Often, the result is load reductions disproportionately allocated to point sources, against which EPA and the states can take legal action, rather than nonpoint sources to which enforceable regulations do not apply.\(^9\) Because of the uncertainties associated with results from nonpoint source programs, EPA suggests in its TMDL guidance that it may be necessary to reopen CWA permits and require more stringent limits on point sources in the event that nonpoint sources are unable to reduce their loadings.

**Action:** With Congressional authorization as needed, EPA and the states should reform the TMDL process to achieve reliable, least-cost loadings reductions regardless of source and/or other in-stream actions to restore ambient water quality goals, with appropriate financial support where needed, monitoring, and enforcement.

**Pollutant Load Trading.** Currently, many states enable groups of wastewater treatment utilities within a watershed to work together — that is, trade pollutant loadings among themselves — to attain ambient water quality standards through any combination of loadings that minimizes aggregate costs. Until very recently, states did not allow such trading among point and non-point sources, even though in some watersheds, the cost of removing pollutants per unit removed from non-point sources is 10 to 100 times less than point sources.\(^{10}\) One of the key features of a successful trading program is regulatory flexibility, which enables regulated sources adequate time to attain superior water quality outcomes across all dischargers rather than focus strictly on ways to meet their own ever-increasing permit restrictions.

**Action:** Congress should support greater adoption of watershed-based solutions by explicitly encouraging trading in the Clean Water Act and extending permit terms for facilities that are participating in these processes. Similarly, EPA should work with delegated states to promote viable and flexible trading programs.

**Adaptive Management.** The term “adaptive management” in the broadest sense refers to the philosophy of using new information to modify actions within a long term project strategy. The Wisconsin Department of Natural Resources has incorporated the term in a somewhat more narrowly defined man-
ner to describe a regulatory compliance strategy whereby a permitted point source (or group of point sources) will work towards water quality compliance with a state designated water quality standard by developing partnerships within the watershed to balance load reduction efforts by both point and non point sources. The intent is to reduce discharges of the parameter of concern to the water body by the most cost effective method rather than relying strictly on reductions by point sources through installing tertiary treatment. Point source dischargers are afforded flexibility and can defer or avoid costly infrastructure installation by facilitating load reductions within the agriculture or other non point sectors. Adaptive management differs from water quality trading in that it doesn’t require trade ratios or margins of safety, but does require demonstration of eventual compliance with the ambient water quality criteria in the receiving water. Adaptive management activities often achieve complementary improvements in the watershed in addition to reduction of specific parameters of concern.

**Action:** EPA should amend its TMDL regulations and guidance to formally incorporate adaptive management as part of the TMDL approach. Until it does, EPA should issue guidance to state regulators that encourages states to pursue these voluntary processes based on the Wisconsin model.

**Extracting Energy from Wastewater and Biosolids**

San Diego’s Point Loma Wastewater Treatment Plant operates a 1,350 kilowatt hydroelectric plant that captures hydrokinetic energy sufficient to power 1,300 homes as its treated effluent drops 90 feet prior to discharge through a 4.5 mile ocean outfall.

Irvine Ranch California, serving roughly 500,000 people in Orange County, is now installing a biosolids to biogas plant, which will save its customers more than $10 million a year for the next 20 years (about $100/year per customer).

Massachusetts Water Resources Authority, serving 43 communities in greater Boston, generates about a quarter of its energy needs from its own power plant fueled by methane produced in its anaerobic digesters on Deer Island. This process, which also produces hot water used in treatment processes, saves $15 million a year in fuel oil costs and another $2.8 million a year in electricity.

Dried biosolids also can be used as a much cleaner fuel than coal. A cement kiln in Union Bridge Maryland uses about 40,000 tons/year of dried biosolids pellets in place of coal. Another kiln in Rialto California uses 1,640 wet tons/day of biosolids converted to 300 tons/day of dry biosolids fuel (95% solids) with 5,529 Btu/lb in energy value (slightly less than low grade coal).

Detroit’s Water and Sewerage Department is planning to construct a biosolids drying facility by 2016 to produce up to 200 dry tons/day of dried pellets, which may be used as a fuel source in electric power plants in place of coal, helping meet the state’s mandate of 10% of its power from renewable sources. Dried pellets also may be used as a fertilizer/soil amendment.

Energy Extraction from Wastewater and Biosolids. According to recent industry analyses, heat and embedded energy in biosolids extracted by US clean water agencies contain enough energy to meet up to 12% of US electricity demand. Aside from the savings in utility energy costs and potentially, revenues from the sale of surplus energy and carbon credits, energy extraction/conversion at wastewater facilities contributes to energy independence, reduces the community’s carbon footprint, and saves ratepayers money. As documented above, some US clean water agencies are converting their wastewater solids to energy using anaerobic digesters to produce methane, which is converted to electricity. Others use dry biosolids as a fuel. A promising technology converts biosolids to a combustible gas via pyrolysis. Energy also is recoverable from wastewater itself. Treatment plants, especially in cold climates use heat exchangers to extract heat from effluent to pre-heat processes, offsetting energy demand. Promising technologies include solar conversion of nutrients in wastewater effluent to algae.
for use in biofuels production and use of wastewater fuel cells to capture electricity created when microbes convert compounds of carbon and nitrogen. Following are examples of energy-related legislative and regulatory actions that would provide incentives for clean water authorities to recover energy or eliminate barriers that inhibit some facilities from doing so. Continued analysis of these and other energy-related matters is needed, however, as more utilities take on energy projects.

**Expansion and Clarification of Current Energy Tax Credit and Incentive Programs.** Some of the existing federal tax credit and incentive programs designed to promote investment in renewable energy did not necessarily contemplate clean water agencies as developers or partners with private developers. Included here are such programs as the renewable fuel standard, renewable energy production tax credit, clean renewable energy bonds, and qualified energy conservation bonds. As the nation moves toward energy independence through for example, development of renewable energy standards, the wastewater community needs to be part of the conversation to ensure that the energy they generate is included.

*Action: The clean water sector should work with Congress to examine these programs to assure that they do not exclude or limit their participation and where it does or can, they should work with Congress to amend authorizing language to ensure that private investors have every incentive to partner with clean water authorities to extract energy from wastewater and biosolids, and to ensure that renewable energy from these facilities however generated is eligible to participate in markets for renewable energy.*

**Use Multi-Media Benefit and Risk Frameworks to Resolve Regulatory Conflicts that Inhibit Energy Recovery at Clean Water Authorities.** As America’s clean water authorities innovate around energy recovery, conflicts will inevitably arise between energy recovery and other objectives. These can be resolved using multi-media risk and benefit analyses. In March 2011, for example, EPA finalized new source performance standards and emission guidelines for new and existing sewage sludge incinerators intended to reduce emissions of nine pollutants from these facilities. This rule is currently the subject of litigation. According to the wastewater industry, these rules will make it prohibitively expensive for clean water agencies to invest in innovative biosolids incineration/energy production technologies. It is questionable whether the modest potential reduction in public health risk from this proposed rule exceeds the risks associated with the alternative of landflling biosolids. Where these incinerators are used to recover energy, additional environmental and public health returns in the form of reduced fossil fuel use and reduced carbon and methane emissions should exceed any gains from the proposed rule.

*Action: EPA should revise the March 2011 sewage sludge incineration rule to exclude sewage sludge incinerators that use biosolids to generate energy. More broadly, EPA should work with clean water authorities to formulate procedures that account for multi-media assessment of energy and resource recovery alternatives at their facilities, so that future rules can take a broader, more holistic perspective of all environmental benefits and risks.*
Relief from Limits on Tax-Exempt Bonds Used to Finance Publicly Owned Renewable Energy Projects. Under section 141 of the Internal Revenue Code, public clean water agencies cannot issue tax-exempt bonds to finance energy recovery or energy production projects if more than 10% of the energy produced is sold to private users, including generally, feeding unused electricity back to the grid. This rule can affect projects that recover methane from wastewater solids, create electricity by burning biosolids fuels, recover municipal landfill methane to produce electricity, or use utility land to generate electricity from photovoltaics or wind-powered generators. In place of low-cost tax-exempt bonds, utilities faced with this rule can reduce output of their project to just their own needs, use higher-cost private activity bonds or taxable bonds, or partner with an energy service company who finances the project. All of these alternatives either limit energy recovery potential and/or increase costs.

**Action:** Congress should relax the private-use test for publicly owned and operated energy recovery or production projects as long as the issuer first satisfies 100% of its own energy needs before selling excess production.

Including Combined Heat and Power (CHP) Projects at Clean Water Agencies in State Renewable Portfolio Standards (RPS). Many state RPSs require that a specified percentage (typically 10-30%) of energy produced within the state comes from renewable energy sources. As of October 2012, 37 states and the District of Columbia had established RPS requirements or goals. But only 28 of these states included biogas from the anaerobic digestion of wastewater solids or waste heat recovery as an eligible resource. RPSs stimulate market and technology development for renewable energy. If states do not include biogas (methane), synthetic gas (other carbon-based combustible fuels) and heat recovery, which include nearly all of the methane recovery/electricity generation projects at wastewater treatment plants as an eligible resource, energy solution providers and energy users lose valuable incentives to invest in or buy power from these sources.

**Action:** State legislatures should amend their RPS eligibilities to include energy recovery projects from biosolids. To help legislatures understand why such changes would generate triple bottom-line benefits, the wastewater industry should educate state legislatures on this matter.

Water Reuse. Most federal and state water use and water quality legislation was written and first implemented decades ago, before water reuse was widely practiced. As a result, these statutes and the regulations pursuant to them could be easily clarified to encourage more reuse where it can be shown to be valuable, cost-effective, and safe. In its recent study of water reuse, the National Academy of Science noted several instances where legislative or regulatory initiatives would result in such outcomes. Continued analysis of these and other reuse matters is needed, however, as more utilities take on reuse projects.

Water Rights. According to the National Academy report, state legislation that governs creation and allocation of water rights to users generally was not written contemplating reuse of wastewater. Many states have not yet addressed this matter and conventions vary widely among the states that have amended their water laws to accommodate reclaimed water. Generally, it remains unclear whether reclaimed wastewater creates a new supply or a right to use it, and if it does, to whom this right belongs, especially where downstream uses including the environment could be disadvantaged.
some states, utilities have explicit, but limited rights to reuse water, as is the case in Colorado where water reuse is limited to the amount imported from outside the basin or that originated as groundwater. In Utah and New Mexico, utilities essentially must have or buy water rights before they can reuse wastewater. Legislation in other states, like Florida and New Jersey explicitly encourages and promotes reuse of wastewater.

**Action:** States should clarify use rights associated with, and rules governing groundwater storage of, reclaimed wastewater so that private developers and public agencies would have stronger incentives to engage in non-potable reuse of wastewater.

**SRF Priorities to Include Water Reuse.** Under the Clean Water Act, states have wide latitude to set priorities for funding projects using State Revolving Fund (SRF) monies. States facing strong demand and limited natural supplies for water could stimulate local consideration of reuse by driving more SRF funds to these projects through, for example, explicitly recognizing wastewater recycling and reuse as an eligible category for funding, working with SRF borrowers to structure SRF applications that meet other state requirements for funding, and generally taking other actions that promote needed and feasible wastewater reuse projects.

**Action:** States in which additional water reuse would help meet future demand for water supplies safely and at least cost should amend SRF eligibilities to include wastewater reuse.

**Public Health Protection.** Recent risk assessments have shown that properly designed and operated indirect potable wastewater reuse presents public health risks that are orders of magnitude lower than so-called “de-facto” reuse, which already occurs in many places today where public water supplies are drawn from waterways into which treated municipal wastewater is discharged upstream. These sorts of risk comparisons are part of the solution to public acceptance of water reuse, but water utility boards are still reluctant to propose, and the public is still reluctant to accept, direct potable reuse. US experience with de-facto reuse across major river systems plus the experience of Singapore (see side bar on page 9) suggests that at least some forms of potable reuse can be designed to be safe.

**Action:** Consistent with the findings of the National Academy in its recent study on water reuse, Congress should amend the Safe Drinking Water Act to make explicit certain safeguards (e.g. advanced treatment, increased monitoring) that are needed to assure that potable reuse can indeed be safe.

**Statutory Acknowledgement of Water Reuse.** Regulatory frameworks, most notably the Safe Drinking Water Act and Clean Water Act, fail to address adequately the important role that recycled water supplies can play in terms of public health and safety or sustainable water quality improvement.

**Action:** Congress should consider three amendments to the Clean Water Act to acknowledge water recycling and reuse where it is feasible and desirable locally: 1) redefine POTW to identify its ability to be a resource provider, 2) extend permit terms for projects that employ resource recovery activities.
such as water recycling, 3) name water reuse as eligible for federal financial assistance.

Executive Order on Water Reuse. Currently, at least nine federal agencies play some role in water reuse. By working more closely together, these federal agencies can improve results of their programs and perhaps eliminate duplication. Local clean water agencies and technology developers also would benefit. An Executive Order on water reuse could help coordinate federal reuse policies and programs and stimulate innovation.

**Action:** The President of the United States should consider issuing an Executive Order that (a) creates a Federal Interagency Task Force on Water Reuse to coordinate all federal water reuse initiatives, and (b) sets a goal for minimum percentages of reclaimed water for all new federal installations (similar to the federal goal for recycled paper).

Institutional and Programmatic Actions

In many cases, simply changing program priorities or administrative processes can drive innovation and help clean water agencies implement effective and efficient UOTF activities.

**Leveraging Green Infrastructure to Transform Urban Spaces**

Green infrastructure (and reduction of infiltration and inflow to collection systems) offers cities innovative ways to reduce stormwater flows to treatment facilities and polluted runoff to water bodies. Some cities are taking green infrastructure beyond water quality by embedding it within broader initiatives to restructure ways to use urban lands and the way people live, work, and play in urban environments. Significant opportunities exist in vacant lots, roofs, roads, bridges, corridors, medians, parking lots, and other paved spaces for green approaches to stormwater management.

Cities like Washington DC, Portland OR, Syracuse NY, New York City, and Philadelphia PA are taking such steps today. Under a $2 billion agreement signed in 2012 between the two parties, for example, EPA will provide technical support and monitoring including school gardens and low-income neighborhood revitalization through green design in partnership with Philadelphia on the city’s 25-year “Green City, Clean Waters” plan, which aims to protect and enhance urban watersheds by managing stormwater with green infrastructure techniques.

DC Water’s new Clean Rivers, Green District partnership with Washington DC uses green infrastructure to prevent pollution from coming into contact with rainwater in the first place, while also providing public health, livability, and economic benefits for the District and its residents.

The New York City Green Infrastructure Plan predicts that, “every fully vegetated acre of green infrastructure would provide total annual benefits of $8,522 in reduced energy demand, $166 in reduced CO₂ emissions, $1,044 in improved air quality, and $4,725 in increased property value.”

Next generation stormwater utilities can replicate and extend this concept more broadly by partnering with urban planning agencies, architecture and planning faculty at local universities, and experts from across the industry and related professions that have pioneered and demonstrated these concepts.

EPA supports these approaches with a variety of grants as do many other federal and state programs, including prominently, the federal and state Departments of Transportation.
Options include:

- Acknowledging and Paying for Stormwater as Part of a Broader Integrated Water Management Approach
- Leveraging Green Infrastructure to Transform Urban Environments
- Integrated Water Resources Decision Making and Management

Acknowledging and Paying for Stormwater as Part of Integrated Water Management. Municipal separate storm sewer systems (MS4s) are required to develop and implement stormwater management programs to reduce contamination of stormwater runoff within their jurisdictions. According to the most recent analysis, the US will have to spend some $42 billion over the next 20 years to comply with requirements. Many urban stormwater control authorities have designed equitable and efficient ways to finance their programs, including frequently, user fees based on land-owners’ proportion of impervious surface within the watershed. A growing number of lawsuits by ratepayers, however, are challenging new stormwater fee programs, arguing that impervious-based charges for stormwater represent an illegal tax. Other complications include legal challenges to stormwater programs that require on-site retention of stormwater, a low-cost and green approach, arguing that they constitute illegal local land use controls. Utility leadership can help avoid costly legal challenges that can delay implementation by educating the public about the long-run benefits of effective, efficient, and equitable stormwater management programs such as least life-cycle costs to ratepayers, distribution of costs in proportion to source of runoff, preservation of open space, and creation of habitat.

Action: Using materials that they have already developed, EPA should support local stormwater management entities in initiatives designed to educate the public about the value of, and equitable ways to pay for, stormwater management as one component of integrated management plans for all water resources within local watersheds.

Integrated Water Resources Decision Making and Management. The transition to the UOTF will be much more effective and efficient to the extent that clean water agencies make joint decisions with other water management and regional planning interests within their service areas. The complication is that in nearly all watersheds, responsibility for these decisions is highly fragmented into multiple public and private entities. Even modest changes in the institutional structure of these entities could have profound results in terms of planning for and allocation of water from all sources to all uses according to availability, cost, and quality. One recent water industry examination of integrated water management called for federal guidance on a “one water” policy from the President’s Council on Environmental Quality, better coordination or consolidation of the many federal water programs, and creation and funding of a national water census.

There should be no doubt that these initiatives would have positive outcomes. But, as all analyses rightly point out, sustainable solutions are likely to come as much from the bottom up as from the top down — from those that allocate, regulate, use, price, and pay for water in all its forms (drinking, wastewater, stormwater, etc.). In the short run, clean water utility leadership can organize the many entities that use water or affect its quality within their watershed.
Action: Regional governments should consider creating joint water/wastewater/stormwater utilities that can manage all water within their jurisdictional boundaries as a single resource. Further, these unified water management enterprises would be better equipped to coordinate more effectively with land-use, transport, housing, energy, and other local authorities that use or affect water.

Financial and Risk Management Actions

As regulations and their compliance costs increase and aging infrastructure needs to be replaced, competition for available funds will remain one of the top barriers to more widespread adoption of UOTF initiatives. Ultimately, most UOTF initiatives will reduce future costs or raise additional revenues, so part of the funding solution lies in utility leadership and communication to the public about their own transition and the future of the community under a traditional path versus the UOTF. But many of the benefits of the latter course accrue far beyond community boundaries, for example, to cities downstream that enjoy cleaner waterways and safer water supplies, indeed to the nation as a whole as UOTF initiatives move the nation toward energy independence, reduced greenhouse gas emissions, creation of green jobs, and a stronger economy.

The business case for the UOTF, therefore, argues strongly in favor of a blended approach to funding that draws on local as well as national sources, both public and private. Such an approach would rely on existing grant and loan programs as well as the public capital markets to provide project financing. It also would draw on more innovative partnerships with private solution providers like energy service companies and technology developers that share risks and rewards with public wastewater entities through, for example, performance contracting.

Most forms of long-term funding for infrastructure replacement do a good job of reducing risks associated with failure of assets that could wear out. They are generally less effective in reducing risks associated with performance of new and innovative technologies that promise to improve performance and/or reduce total lifecycle costs. Many suggest that adoption rates for new technology within the municipal clean water sector are too slow to compel serious investment in technology innovation, and in turn, this limit gains in productivity of invested capital in this sector.22

Options include:

Federal Grant Programs That Support UOTF Initiatives

US Department of the Interior, Bureau of Reclamation. Title XVI 25% matching grants up to $20 million to design and construct demonstration and permanent water reclamation and reuse facilities in the 17 continental US states and to conduct research on reclamation and desalting of impaired surface and groundwater.

US Department of Energy. Energy Efficiency Block Grants to cities, counties, and states to implement energy efficiency projects and programs as well as State Energy Program grants that provide states willing to match at 20% grants to fund energy efficiency and renewable energy programs, including establishment of revolving loan funds to finance local projects.

Environmental Protection Agency. Clean Water and Drinking Water State Revolving Fund capitalization grants to states that fund capital investments to comply with the Clean Water Act and Safe Drinking Water Act, respectively, and separately, a Green Infrastructure Program that provides technical assistance to communities pursuing green infrastructure solutions to comply with stormwater requirements.

US Department of Agriculture. Rural Utility Service financial assistance to towns with populations less than 10,000 for wastewater and stormwater facilities. Rural Development loans and guarantees to build bio-refineries. Natural Resource Conservation Service and Farm Service Agency for conservation objectives, including nutrient controls.
Focus Federal Grant Programs on Implementation of UOTF Initiatives. At least four federal agencies support grant programs that have helped or could help clean water agencies plan and implement UOTF actions: the US Environmental Protection Agency (EPA), the US Department of Energy (DOE), the US Department of Agriculture, and the Bureau of Reclamation (USBR) within the US Department of the Interior. These programs could focus greater attention on implementation of UOTF activities (research and development will be discussed in a subsequent section) and as they do, clean water agencies contemplating UOTF actions should familiarize themselves with these programs and participate in them as appropriate.

**Bureau of Reclamation.** Launched in 1992 (Public Law 102-575), the USBR’s Title XVI program authorized the Department of the Interior to design and construct demonstration and permanent facilities to reclaim and reuse wastewater in the 17 Western states. As of November 2010, approximately $531 million has been appropriated for 42 of the 53 authorized Title XVI projects. The program has generally provided cost sharing for up to 25 percent of the total project costs, with a project maximum of $20 million. As of the end of 2010, the program had a $630 million backlog for projects awaiting appropriations, up from the $354 million backlog in 2006.

*Action: The Bureau should focus federal grants on reuse projects, without which returns would be insufficient to attract private co-investment and where they deliver high net economic and social benefits.*

**Department of Energy.** Among the many renewable energy incentive programs that DOE administers, the Energy Efficiency and Conservation Block Grant (EECBG) and State Energy Program (SEP) grants are perhaps best suited to support UOTF projects at clean water agencies. EECBG, passed in 2007 and was first funded in 2009, provided formula block and competitive grants to cities, counties, states, and Indian tribes to implement energy efficiency projects and programs. SEP provides grants to states that match them at 20% to implement a wide variety of energy efficiency and renewable energy programs and projects. About 95% of the $6.3 billion funds appropriated to these two programs under the 2009 American Recovery and Reinvestment Act (ARRA) are obligated to existing activities, some of which benefitted clean water agencies directly, including EECBG funds that helped finance a new power plant in Miami-Dade County Florida that burns methane recovered from the local clean water agency and local landfill.

*Actions. (1) Clean water agencies should take advantage of any unobligated grant funds and to the extent they are eligible, loans from the 29 states that established revolving loan funds using SEP grants. (2) On the basis of strong performance of the 2009 ARRA funding, the wastewater community*
should advocate for continued funding under these programs, with explicit acknowledgement that clean water agencies should be priority recipients of funding assistance.

Environmental Protection Agency. The largest sources of loans and limited grants available to utilities for UOTF initiatives are the 50 EPA grant-funded State Revolving Funds. Given their key role, there should be no doubt that continued funding of these institutions is critical. In addition, EPA’s Green Infrastructure Program is providing technical assistance to 27 community partnerships (10 in 2011 and 27 in 2012) to support their efforts to implement green infrastructure solutions to stormwater problems. Assistance (e.g. public charrettes, tactical team assistance, and information sharing on financing) responds to needs, but does not include grants or loans. The value of this assistance is generally small ($35,000-$75,000) and focused on specific products like code reviews, conceptual designs and strategies for green infrastructure approaches, selection of green infrastructure elements, modeling the performance of green infrastructure, or evaluating costs and benefits of green infrastructure. While small, recipients often use this assistance strategically, to meet specific scientific or research needs, to motivate broad participation across their communities, and to engage regulators on matters of affordability and compliance scheduling. An October 2011 joint statement of EPA’s Office of Water and Office of Enforcement not only endorsed green infrastructure as part of integrated watershed planning, but noted that EPA and the states have, “flexibility to evaluate a municipality’s financial capability…and to set appropriate compliance schedules.” Clean water agencies, especially those that have stormwater management responsibility are typically participants of these community partnerships.

Action: The wastewater community should advocate for a continuation, if not an expansion of these EPA programs. Continued federal funding not only preserves the intergovernmental partnership embedded within the Clean Water Act, it creates jobs and accounts for the “public goods” benefits that all clean water utilities deliver when they ship cleaner water to downstream users; reduce greenhouse gas emissions through energy efficiency, methane reduction, and renewable energy production; and reduce runoff from green infrastructure.

Department of Agriculture. USDA administers several grant programs that can help utilities achieve their UOTF goals. The Rural Utility Service provides loans, loan guarantees, and grants for wastewater and stormwater systems to towns with populations of up to 10,000. USDA Rural Development provides loan guarantees to rural communities to build or retrofit commercial scale “bio-refineries,” which includes biosolids as an eligible feedstock. Its Repowering Assistance Program provides 50% grants to producers and sellers of advanced biofuels, including biogas (methane) derived from wastewater biosolids. A sister program provides annual production subsidies to bio-refineries that scale up production year-on-year. USDA administers multiple voluntary programs accompanied by some $2-3 billion a year in federal subsidies largely through its Natural Resources Conservation Service and Farm Service Agency to achieve a wide variety of conservation objectives. Fundamentally, these programs are designed to reduce soil erosion and wetlands loss, protect habitat, and improve farm productivity. But about 10-15% is used to control nutrient runoff and these funds could be used more widely to meet watershed nutrient loadings limits at significantly less cost than removing the same
nutrient loadings at wastewater treatment facilities located within the same watershed.  

**Action:** USDA should take steps to assure that a greater proportion of their conservation program assistance funds nutrient reduction programs.

**ARPA-W: Early Stage Technology Innovation Grants.** Because clean water agencies are responsible for environmental and public health protection, they tend to be justifiably risk averse. One result of this conservative stance, however, is slow adoption of new technology. Despite the substantial size of municipal clean water equipment and services markets, slow adoption of new technology dampens enthusiasm on the part of technology developers and entrepreneurs, artificially reducing the pace of innovation.

To help remedy this, the clean water sector could draw on successful programs in other sectors like defense and energy that have created early stage research and development grants to stimulate creation of breakthrough technologies. In the defense sector the Defense Advanced Research Projects Agency (DARPA) manages numerous grant programs to stimulate innovative research and development initiatives for weapons, information/communications, electronics, and materials. Modeled after DARPA, the Department of Energy administers through its Advanced Research Projects Agency for Energy (ARPA-E), an R&D grants program to, “focus on creative, ‘out-of-the-box’ transformational energy research that industry by itself cannot or will not support due to its high risk but where success would provide dramatic benefits for the nation.” These programs have generated significant technological advances for their intended industries, spin-off applications in many other industries, and created strong export markets for American technology.

**Action:** Congress should establish and fund ARPA-W to work with industry to define high-risk, high-reward R&D needs, solicit proposals from public and private enterprises that had solutions at various stages of commercialization, and manage information flow about the research for the benefit of the industry and the nation.

**Pooled Risk Sharing Strategies.** Clean water agencies are slow adopters of new technology in part because of environmental and public health risks if new technologies fail to perform and in part because of the economic, political, and regulatory consequences of failure. Two new initiatives are addressing part of the slow adoption problem. First, the Water Environment Federation and the Water Environment Research Foundation have joined together in a new Leaders Innovation Forum for Technology (LiFT) Technology Evaluation Program (TEP) to facilitate collaboration among facilities for the evaluation and testing of new technologies and disseminate peer reviewed information about emerging technologies. Second, a consortium of US drinking water and clean water agencies are structuring an Innovation Technology Advancement Group (iTAG) with a UK technology innovation consultancy to share experiences on new technologies. These could be powerful steps that enhance market pull for new technologies.

But three aspects of adoption risk will remain: (1) abating private development risk and long adoption cycles, (2) simplifying state regulatory approval processes for new technologies, and (3) acknowledging acceptable variability in performance of advanced technologies in new permits.
Risk Abatement Facility within ARPA-W. At least one part of any new program like the ARPA-W proposal above would have to address adoption risk.

Action: Congress should establish within ARPA-W, a special development facility for consortia of clean water agencies, universities/research centers, and technology developers, who together would jointly apply for federally subsidized private insurance that would offset utility costs in the event that piloting innovative technologies was unsuccessful. This facility also could provide tax credits to private corporations that partnered with a grant recipient to help offset risks associated with developing and commercializing its technology.

State Certification Reciprocity. State water quality regulators operate largely independently of each other when it comes to approval of new technology to meet permit conditions. The result is that design engineers are reluctant to include new technologies for a proposed project unless they have been demonstrated to work in that state and at scale, even though the exact same technology may have performed according to spec in an identical application in another state or perhaps another country. This is a strong disincentive for technology developers and investors in innovative technology. Yet, there are numerous situations wherein states reciprocate to avoid just this sort of problem: automo-

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Why are Clean Water Agencies Typically Slow to Adopt New Technology?

Not all clean water agencies behave this way, but broadly, they accept new technology very slowly, which damps innovation. Here’s why:

**Regulations** — clean water agencies have navigated the past 40 years of rules, permits, enforcement actions, and penalties by choosing technologies that are 100% proven. New technologies must have a large cost savings to offset risks of deviating from traditional choices.

**Management Capacity** — clean water agencies are highly capital- and asset-intensive enterprises that manage large workforces over broad geographies, with state, federal and local governing body oversight at the front and thousands of customers to satisfy at the end of their value chains. Many simply have little spare capacity to manage new technology.

**Reward Systems Favor the Status Quo** — few clean water agencies reward management for taking risks. Generally, just the opposite is true. Consequently, decisions tend to maintain the status quo.

**Asymmetry in Public Visibility** — when clean water agencies perform well, services are typically taken for granted and the public tends to forget that clean water agencies exist. Their failures, however, are generally highly covered by the media and in full public view. The upside of new technology must be substantial, therefore, to overcome the regret and real consequences of technology failure.

**The UOTF Paradigm is Still New** — clean water agencies are still used to cleaning waste and discharging residuals. The UOTF will change the paradigm to resource management. Until then, new technologies will have to be “pushed” into the sector. UOTFs will create new demand, “pulling” technology through the industry.

**Procurement Requirements for Competition** — because of their public heritage, many clean water agencies cannot negotiate with a single technology provider, even if the technology cannot be provided by anyone else.
bile and other vehicle licenses, concealed handgun permits, teacher certifications, on-line education certification, and pesticide licensing procedures (in the 11 Northeast states).

**Action:** An appropriate organization of the fifty states such as the Council of State Governments should formulate a program of reciprocal technology certification, where once tested and permitted in one state, the burden of proof to deny a permit for that technology in any other state falls to the regulatory agency based on guidelines agreed by all 50 states.

**Acknowledging Acceptable Performance Variability in New Permits.** Reliability of some advanced technologies like biological nutrient reduction (BNR) can vary widely from plant to plant, depending on design and actual flows, wet weather events, seasonality, and even diurnal changes in loadings. To reduce regulatory risks, design engineers have attempted to accommodate as many (or all) of these variables as possible. The results is overdesign (e.g. blowers that are too big, reactor basins that are too large, over-sized pumps) targeted to meeting excessively high performance reliability, high initial costs, and expensive and complex operations. To help fix this, engineers have developed sophisticated process models that more accurately predict plant performance, enabling more appropriately sized facilities that are less expensive and easier to operate. If permits reflected variable performance at levels that were still protective of the environment, engineers would design more appropriate facilities and costs of advanced processes would be reduced.

**Action:** Working more closely with the design engineering community to understand new stochastic approaches to performance and design of advanced technologies including BNR, state and federal permit writers need to incorporate results into new permits to assure that they have more realistic parameter limits that are still protective of the environment, but achievable at more appropriate costs.

**Financial Incentives to Reclaim and Reuse Wastewater.** In some parts of the country, wastewater recycling and reuse can be effective and efficient as a solution to water scarcity. According to the National Research Council of the National Academy of Science:

“Approximately 12 billion gallons of municipal wastewater effluent is discharged each day to an ocean or estuary out of the 32 billion gallons per day discharged nationwide. Reusing these coastal discharges would directly augment available water resources (equivalent to 6 percent of the estimated total U.S. water use or 27 percent of public supply).”

In a recent survey of 1,000 US consumers, more than 80% said they favored the use of recycled water for non-potable uses such as irrigation, industrial cooling, and toilet flushing. But the cost of recycling wastewater for these uses can be a significant barrier to more widespread adoption. Reuse production costs vary considerably depending on factors such as quality needed, technology, scale, pumping and energy costs, and financing costs. Recent estimates range from $1.83/1,000 gallons for non-potable reuse, which is roughly comparable to costs of water produced from fresh water supply to $19.44/1,000 gallons. In the same survey mentioned above, nearly half the respondents said they were willing to pay on average, 12.4% more on their water bills.
immediately to ensure that future generations would be less vulnerable to water shortages. So while higher water rates today will be part of the solution, other measures may be needed to fill the gap. Moreover, the gap between reuse costs and other alternatives as above addresses only financial costs. There are significant economic savings associated with wastewater reuse that are not accounted for in strict financial comparisons: reduction in seasonal peak demands on potable systems, which reduces overall capital and operating costs; improved reliability during drought and business investment based on that reliability; and environmental benefits such as preserved in-stream flows, reduced energy demands and lower carbon emissions.

**Action:** To help fill the relative cost gap and generate other economic and environmental benefits of wastewater reuse, the wastewater industry should advocate for wastewater reuse investment tax credits to attract private investment, expanded grants to cover costs of facility feasibility studies, and/or loan guarantees for reuse projects that serve rural or low income communities that could not afford to repay market rates.

### Utility Leadership and Internal Management Actions

As it matured over the last several decades, the clean water sector has embraced the concept of continuous quality improvement in many forms. But despite these improvements, the industry faces a fiscal crunch today unlike any in its history. Federal funding in absolute and real terms has declined by 90% from about $15 billion a year in the 1980s to about $1.5 billion a year in 2012 (all in 2009 dollars). Over this same period, real local investment in wastewater more than doubled from about $27 billion a year to $55 billion a year. Estimates of total sector capital investment needed to meet national clean water goals also has grown from $155 billion in 1986 to $298 billion in 2008, despite a combined federal/state/local investment in wastewater infrastructure of $750 billion during this period. In many places, combined costs of infrastructure replacement and compliance with environmental regulations greatly exceeds both current investment levels and based on standard metrics, affordability for large portions of local populations. Fiscal pressures alone compel leadership and management in the clean water sector to make hard choices every day with limited resources.

While this *Blueprint* is not intended to provide detailed industry guidance, it is important to acknowledge that future successes depend to a great extent on utilities’ initiatives to manage themselves and operate as efficiently as possible. Building on 2007 recommendations from leadership in the drinking water and clean water sector, EPA, NACWA, WEF, and other industry associations published a statement of support for an overall utility management framework based on a series of *Attributes of Effectively Managed Utilities and Keys to Management Success*. This document acknowledged and to a degree codified that business in this sector needed to be done in a different way. In 2008, these organizations published the Effective Utility Management Primer for Water and Wastewater Utilities, which reaffirmed the industry’s commitment to “Effective Utility Management” or EUM, as a way to assess utility strengths and weaknesses, set institutional priorities, and decide on outcomes they wished to achieve. This collaboration between regulatory and clean water agencies is encouraging as a foundation for further progress.

Other tools and initiatives that are consistent with EUM can help utilities achieve continuous improvement in the productivity of their organizations and help set environmental and public health priorities in a resource constrained world:
Lean Operations/Six Sigma for Continuous Improvement

Lean Operations/Six Sigma for Continuous Improvement, specifically “Lean”, is a business improvement approach designed to eliminate non-value adding activity or “waste” using methods developed for manufacturing industries including automotive. Practitioners often combine Lean methods with Six Sigma tools, developed by Motorola and embraced by GE, that use statistical analysis to eliminate defects and variation. Lean and Six Sigma are widely used across the industrial sectors to identify and drive productivity gains through organizational, business process, and technological change. Clean water agencies that use Lean/Six Sigma save millions of dollars, improve service quality, build a confident and motivated workforce, and reduce environmental and safety risks. Its culture of continuous improvement through employee engagement essentially retrains the workforce to think about productivity, take actions to improve productivity, and be rewarded for their successes.

Nationally Consistent Operator Training and Certification

Nationally Consistent Operator Training and Certification. Today’s sophisticated resource recovery facilities require highly trained operators that are able to work anywhere in the nation without obstacles. Unfortunately, the Clean Water Act does not require training or certification of operators. Complicating matters further, most states have unique training requirements, so operators certified in one state will not necessarily be certified in others. The UOTF will require more consistency, with a national baseline standard for operator training and certification, perhaps based on the toughest state standard, which would also allow for reciprocity.

Environmental Education

Environmental Education. UOTFs will need to advocate for themselves through strong programs of environmental education. Today’s students are tomorrow’s legislators, ratepayers, and the children...
of today’s legislators and ratepayers. Thus, it is essential to acquaint children with the importance of water to public health and, ultimately, the welfare of our society. UOTFs also need to make the broader public benefits case regularly to legislators, governing boards, ratepayers, and the press, demonstrating delivery of value for money and reminding the public of the environmental and economic services they deliver every day.

Environmental Management Systems to Set Priorities. An Environmental Management System (EMS) is a framework that helps any organization achieve its environmental goals through consistent control of its operations. EMSs address regulatory demands and other objectives like energy conservation or reduction of infiltration and inflow to collection systems in a systematic and cost-effective manner, setting priorities to reduce risks of non-compliance and improve public health and safety outcomes for the public and employees, respectively. In practice, clean water agencies have found that EMSs also enable the organization to capture institutional knowledge, making it available to future decision makers, in effect ensuring continuity over generations of leadership and management.

Smart Technology to Improve Service Delivery and Customer Care. Web-enabled tablets, smart phones, and cloud-based communications have transformed the way clean water agencies deliver services and interact with their customers. They enable customers to share information instantaneously about service disruptions, faulty infrastructure, and meter figures as backup to automated readings. Work orders can be routed efficiently to field crews according to their location, enabling very fast response times. They also enable work crews in the field to access and update vital information stored centrally about asset location, condition, and performance. Smart phones allow customers to track progress against work requests in real time. Credit card and check payments using mobile devices linked to central billing and collection databases avoid labor-intensive turn-off/turn-on trips. Social media allows dissemination of critical information to customers to support both routine and emergency activities. Smart meters enable automated, labor-free two-way monitoring, communication, and control (customer to utility and vice versa) of usage patterns for billing and for customer awareness. GPS

The Lawrence, Kansas water and clean water utility serving 90,000 customers implemented a utility-wide EMS in 2007. As a result, it reduced biosolids transportation and land application fuel use by 13.5%, eliminated drinking water taste and odor problems, sited a new 530 acre wastewater treatment plant, achieved 73% customer satisfaction, and reduced workers compensation liability by more than 20% in three years.

The Camden County NJ Municipal Utilities Authority (CCMUA) used an EMS process to address its discharge and biosolids issues with equally impressive results. Prior to its EMS, CCMUA was barely meeting its state discharge permit, being fined and sued for almost continuous odor problems and had recently raised its user rates by over 22%. Through the EMS, the CCMUA identified its core objectives to be (1) optimization of water quality, (2) minimization of odors and (3) cost efficiency. Within 5 years of implementing an EMS, the CCMUA improved solids capture by 40%, virtually eliminated its odor problems, completely overhauled its physical plant, and reduced suspended solids in its discharge from 26 to 7 parts per million (permit limit of 30 ppm). The utility accomplished all of this while reducing rates from $337/household in 1996 to $324/household in 2012.

Global Water Resources, which operates a portfolio of small and medium drinking water and clean water agencies in Arizona, is perhaps the most technologically sophisticated utility in the US. It has taken utility efficiency to a new level using evaluation and productivity improvement processes (Total Water Management) similar to Lean, advanced metering infrastructure, and cloud-based data analytics and presentation technology to reduce water losses and put real-time monitoring of water use in the hands of their clients.
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devices on agency vehicles enable greatly improved accounting and accountability of rolling stock and field labor, saving thousands in fuel costs.
The previous section examined incentives for, and barriers to, innovation. It proposed ways to change current regulations, financing conventions, risk allocation mechanisms, administrative procedures, and operating efficiencies to broaden incentives and overcome barriers. There is no doubt that these actions will help utilities transition from collectors and handlers of wastewater to resource managers and environmental leaders.

Many believe, however, that we must go beyond changes to current conditions to arrive at the UOTF, that bold and transformative thinking will be needed to effect quantum movement in operating performance, cost, environmental outcomes, and community involvement.

The sorts of initiatives described in this section are ambitious and complex. It will take time to fully define objectives, roles, scopes, milestones, and measures of success. Consequently, only the concepts are introduced in this Blueprint.

Congressional Caucus to Advance UOTF Initiatives

We are perhaps only a few years into a multi-decade transition and at this early stage, it is difficult to foresee all the possibilities. Under these circumstances, while creating an environment of innovation, it seems prudent to also create forums that enable continuous exchange of ideas as they arise. The utility side of the industry has such forums as do technology developers, design engineers, and solution providers. But no such forum exists at the Congressional level to raise awareness among legislators. And clearly, nothing short of a national strategic initiative will result in the kinds of outcomes needed to meet the challenges of the 21st Century and beyond. A Congressional Caucus on the UOTF is one way to elevate the importance of water to our society and ensure that the federal government is doing everything it can to support the industry.

Action: Congressional leaders from both House and Senate authorizing committees should create a Congressional Caucus to bring together legislators, sector leadership, and leadership from within the regulatory, finance, and related communities. The Caucus would enable systematic evaluation of some of the actions discussed in this Blueprint as well as new approaches to solve problems as they arise. Key federal water agencies would participate, perhaps
marking the beginning of better federal interagency coordination on water policy and program objectives. Over time, especially in light of inevitable moves to balance the federal budget, one could imagine this group formulating a sensible approach to consolidating the federal role into fewer, more targeted offices and programs.

Creating the Industry of the Future

The future of clean water agencies is emerging largely because of the efforts of dozens of forward thinking leaders in the sector. Regulators, technology developers, consulting engineers, and the industry’s professional organizations are supporting this transition. But like any emerging trend, the sector is not yet organized optimally.

The major professional organizations representing clean water agencies can play a key role in organizing the industry to create and sustain the “Industry of the Future.” The Task Force that came together under their auspices to create this Blueprint can become a powerful driver on their behalf. A concerted movement to organize the clean water sector behind the “Industry of the Future” would include such activities as focused, collaborative research; advocacy for legislative change; advisory services to regulators; public information; and a UOTF knowledge base platform that details and updates the latest UOTF technologies and processes, enabling the nation’s 16,000 clean water agencies to replicate them.

Action: The UOTF Task Force organized to support this Blueprint, working with the clean water industry associations, should be the driving force behind implementation of the actions noted herein, especially those that deal with internal activities and creation of an “Industry of the Future” knowledge base. For those that require regulatory action, the Task Force should work with EPA in the capacity of a UOTF Advisory Board. For those that require Congressional action, the Task Force would represent the industry in hearings.

An Intergovernmental Partnership to Address Adaptation to Extreme Weather Events

Recent events such as the broad drought in the summer of 2012 or Hurricane Sandy in the fall of 2012 serve
as constant reminders both of the critical services that clean water utilities provide and of the vulnerability of their physical structures to extreme weather events. Because centralized facilities are typically sited at the lowest elevation possible to facilitate gravity flow, clean water facilities are particularly susceptible to floods and sea level fluctuations. Complicating matters further, they cannot be moved easily since urban land is generally scarce having been developed over the years since these facilities were first built and because complex networks of sewers were built expecting large treatment facilities at their terminus.

Many argue that building in physical and operating resilience can be a viable and cost-effective solution. Elements of such a solution include physical barriers, redundant components, remote operations facilities, and other sorts of hardening approaches. But these may only buy time, especially if climate change results in more frequent and more severe flooding and/or continued sea level rise. Operational resiliency will help under these circumstances, including for example, broad and well exercised inter-local cooperation agreements, regional emergency equipment stores available to multiple facilities, city-wide command centers to manage through an emergency event, and advance warning systems that enable portions of networks to shut down and perhaps divert flow before systems are hydraulically overloaded. Green infrastructure is the third key element, where hard urban surfaces are replaced by vegetated or permeable surfaces to retain runoff and natural shoreline features such as wetlands and sand dunes are restored to mitigate the effects of storm surges.

None of these options are inexpensive. Beyond funding, all of these options involve extensive planning, public education and involvement, changes to individual and corporate behaviors, and potentially changes in land use.40

**Action:** The nation’s clean water professional associations should organize a coordinated program to synthesize on-going research and more fully define and recommend elements of a program of action on resilience in response to extreme weather events for the nation’s clean water infrastructure. Based on these recommendations, the US Congress should support a concerted 10-year partnership with the states to formulate and help finance infrastructure and other measures to ensure implementation of resiliency plans at all susceptible facilities.

### Creating Real Markets for Water

As more clean water agencies reclaim water to reuse in industrial cooling, landscape irrigation, groundwater recharge, and possibly potable water supplies, questions will arise as to the rights to these sources of supply, especially in the western states that operate under a prior appropriations water rights doctrine. A well-defined market for buying and selling water rights within targeted watersheds would support an orderly transition to such reuse and support clean water agencies that wish to create new revenues from the sale of reused water. Aside from the benefits to clean water agencies, well-defined and organized markets for water would help water-short urban centers sustain temporary supplies from less productive users like farmers irrigating marginal lands during droughts.

Water transfers are possible today and, in fact, there are more than two decades of experience in states like California with modest numbers and types of transfers, although they have declined in number in recent years.41 The market could be significantly strengthened if either or both state agencies that administer water
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rights systems within their states and/or the federal government in their capacity to create and define rules within federal interstate water management compacts better define and possibly manage a market for public and private buyers and sellers of water rights.

Facing severe drought for more than a decade, such interventions by the Australian government did exactly this. The Australian water market is considered by many to be the most sophisticated in the world, with more than $3 billion in trades a year. Water rights can be bought and sold separately from land rights and traded on an open market, generally within watershed boundaries. Investors can buy entitlements to water and rent them back to irrigators, or sell the rights into the temporary transfer market. The Australian Government is pursuing a number of initiatives to improve the functioning of water markets: working with Basin states to remove barriers to water trade, developing a National Water Market System that will assist in the efficient management of water registry, transaction and market information functions; and creating and updating market rules. Private water market intermediaries (e.g. water brokers and exchanges) play an important role in the market by bringing buyers and sellers together, reducing search costs, improving information flows and assisting in obtaining regulatory approvals.

Action: The professional organizations representing the clean water industry should initiate an examination, perhaps with such organizations as the Western Governors Association or the Council of State Governments, to examine in detail whether and the extent to which the states acting individually or with input from federal water agencies like the US Bureau of Reclamation could better support water markets to define rights for recycled water and achieve more efficient allocation of all source waters (including recycled water), especially during extreme weather events.
CONCLUDING THOUGHTS

Clean water agencies face unprecedented challenges in the coming decade. Fiscal pressures have never been greater. Infrastructure upgrades, expansions, and replacement have never been more critical. Regulatory demands to control nutrients, combined sewer overflows, and sanitary sewer overflows have never been stronger.\textsuperscript{43} Future threats of system failure from extreme weather events have never seemed more real.

Yet there is cause for optimism. Sector leadership is stronger than ever. Technology innovation is emerging as a driving force offering design engineers options to make great strides in process efficiency while reducing costs. And most importantly, the sector as a whole is beginning to understand its central role in economic and social well-being. In short, the Utility of the Future is becoming real.

Just a few years into a generational paradigm shift, we cannot fully envision its limits. We do know that each clean water agency will take a somewhat different path from handlers of wastewater to managers of sustainable resources; from regulated entities seeking permit compliance to watershed-scale environmental leaders seeking least-cost environmental and social solutions; from engineers designing concrete and steel treatment works to regional planners designing and building weather-resilient, green communities; from isolated public service units to integrated members of economically thriving local economies.

The actions described in this \textit{Blueprint} are important steps. But despite initial optimism, these steps alone may not be enough. We should build on our momentum to go beyond the Clean Water Act by engaging legislators, industry practitioners, and technology innovators in a conversation about a 21st Century Watershed Act. The Congressional Caucus introduced earlier would be an ideal forum for such a conversation.

A 21st Century Watershed Act would find its roots in the foundations of the 1972 Clean Water Act that called on regulators and the regulated community to find solutions to America’s water quality challenges by working together at the area-wide or watershed scale. The 1972 Clean Water Act embodied several parallel approaches to meet clean water goals: watershed planning, financial incentives to help clean water agencies upgrade and expand treatment works, a system of legally enforceable water quality requirements and discharge permits with penalties for point sources that failed to meet them, and funding for science and technology to fill knowledge gaps needed to justify requirements and permit conditions.
We have accomplished a great deal with these programs and the nation benefits from significantly cleaner water bodies. Over time, however, Clean Water Act priorities have focused much more narrowly on enforcing tighter and tighter discharge limits to the point that future water quality returns to this 40-year old approach will be sharply lower than we have enjoyed in the past and whatever gains may be possible will come at greatly increased costs. Already reduced federal clean water funding is threatened further by budget concerns, tax-exempt public capital markets appear shaky in the current tax-reform debate, and increasingly communities are reaching their limits of affordability of clean water services. The emergence of UOTF initiatives is clear evidence that a new direction is emerging, that the paradigm has changed.

A new 21st Century Watershed Act would acknowledge this paradigm shift and help realign regulatory expectations, federal programs, and the emerging leadership role of America’s clean water agencies as they explore and implement UOTF initiatives described herein. Such an Act would re-create the partnerships previously enjoyed between EPA, state regulators, and clean water agencies. It would embrace sound science based on ecosystem-wide management decisions and holistic evaluation of watersheds to determine sustainable solutions. It would encourage the examination of the historical record for the receiving water to ensure that all causes of impairment are understood and controlled. It would allow for the sorts of watershed processes like adaptive management discussed earlier and “smart engineering” methods to be incorporated as elements of the TMDL process. It would encourage green infrastructure and other solutions that go beyond chemistry in the water column to restore and create fisheries and wetlands or make our shoreline more resilient to extreme weather events while creating the jobs of the future.

The vision of fishable, swimmable waters is something we all share, but new directions are needed if we are to achieve our goals. The progress we are making today is strong evidence that new approaches to resources management are possible, that America’s clean water agencies are prepared to lead, and that communities across the nation are motivated to work together to find least-cost water and resource management solutions that improve local economies and the quality of life. A 21st Century Watershed Act would set this new direction legislatively and launch the next increment of success in water resources management.
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Steering Committee

The Steering Committee was made up of nine members – three from each of the partnering organizations – and was tasked with providing high-level oversight to ensure that the Blueprint achieved the goals set out in the proposal framing the project.

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ENDNOTES

1 BMJ 2007; 334:111.2 http://dx.doi.org/10.1136/bmj.39097.611806.DB (18 January 2007)


4 Agriculture is by far, the greatest source of pollutants that impair US waters. Other sources of impairment or rivers and lakes that exceed municipal sources include atmospheric deposition, hydro-modification, and runoff from urban and rural lands. For details, see: USEPA ATTAINS database and Section 305(b) reports to the US Congress, various years.

5 By comparison, Israel reuses 70 percent, Singapore reuses 30 percent and Australia reuses 8 percent, with a national goal of 30 percent reuse by 2015. For details, see: http://www.nvwra.org/storage/2011/conference/presentations/presMillerWade.pdf

6 Survey of members of the National Association of Clean Water Agencies, September 2012.

7 Ibid.


9 Where there is “reasonable assurance” that nonpoint sources will reduce their nutrient pollutant loadings, a state may allocate more of the needed loadings reductions to nonpoint sources instead of more stringent point source reductions. In their recent review, however, the states and EPA concluded that allocation in the absence of enforcement is unreliable: “States have undertaken and explored different limited approaches to control nonpoint sources. Authority at the federal level for state development of effective, enforceable and
transparent nonpoint source accountability is lacking.” For details, see: State-EPA Nutrient Innovations Task Group, An Urgent Call to Action, a report to the Administrator of the US Environmental Protection Agency, August 27, 2009, page 19.


12 For details, see: http://www.epa.gov/ttn/atw/129/ssi/ssipg.html

13 For details, see: http://www.law.cornell.edu/uscode/text/26/141

14 For details, see: http://www.c2es.org/us-states-regions/policy-maps/renewable-energy-standards


16 Though each state has its own set of rules and conventions, generally the Western states allocate water to users following a prior appropriations doctrine whereas the Eastern states follow the riparian use doctrine. There are many fine books that present the details of state water laws, including for example, A Dan Tarlock, Law of Water Rights and Resources, Clark Boardman Environmental law series, New York, 1988-2010.


18 The City of San Diego CA, which imports 90 percent of its water, has attempted and failed to implement potable wastewater reuse since 2004. See: http://www.sandiego.gov/water/waterreuse/index.shtml

19 These include: the Environmental Protection Agency, Department of the Interior (Bureau of Reclamation), Department of Commerce, Department of Agriculture, Department of Energy, General Services Administration, U.S. Geologic Survey, US Army Corps of Engineers, and Department of Defense.


21 Integrated water resources planning and management has been the focus of literally thousands of journal articles and hundreds of professional and scientific conferences over the years. As water grows scarcer and costlier, incremental progress toward this goal is inevitable. For a contemporary look at integrated water management as it relates to the UOTF, see: US Water Alliance, Managing One Water, 2010.

22 See, for example: Joe Zuback, Strategies for Accelerating Adoption of New Cost-Saving Water Technologies and Solutions in a Risk-Adverse Market, presented at the 104th annual meeting of the Water and Wastewater Equipment Manufacturers Association, Las Vegas NV, November 2, 2012.
23 Although both the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency have limited authorities to provide assistance to local entities for recycling projects (e.g., specific provisions for the Corps in 1992 and 1999 Water Resources Development Acts; a pilot program by EPA under the Alternative Water Sources Act; and general Clean Water Act water treatment and wastewater authorities), neither has an established, regularly funded program dedicated to such activities. For details, see: Betsy A. Cody and Nicole T. Carter, The Title XVI Water Reuse Program: Implementation and Legislative Issues, US Congressional Research Service, October 27, 2006.

24 For complete guidance on these and other DOE programs, see: http://www1.eere.energy.gov/wip/guidance.html

25 Most state loan funds are targeted at specific borrowers in the private sector or low-income households, so loan availability may be limited. For details, see: http://www1.eere.energy.gov/wip/pdfs/sep_rlf.pdf

26 The National Association of Clean Water Agencies has been on the forefront of advocating for SRF funding either in its current form or in the form of a Federal Clean Water Trust Fund. The Water Environment Federation also has been a strong supporter of SRF funding and more recently has called for a new Water Infrastructure Finance and Innovation Authority (WIFIA) to be created.

27 For details, see: http://water.epa.gov/infrastructure/greeninfrastructure/gi_support.cfm


29 See: http://arpa-e.energy.gov/About/About.aspx

30 For details, see: http://www.werf.org/lift/Home/lift/Home.aspx?hkey=2cd855fd-d6da-44b2-a6ae-92c66436a704

31 This leader of this consortium is Southern Nevada Water Authority. Isle Utilities organizes the iTAG. See: http://www.isleutilities.com/


35 For details, see: http://www.watereum.org/

These methods are similar to the initiatives that NACWA pioneered in the 1990s in their guidance and sector workshops, *Thinking, Getting, and Staying Competitive: A Public Sector Handbook, and High-Performance Business Services*.


Many initiatives are already under way to address resiliency of US water and wastewater infrastructure, including for example, the Water Utility Climate Alliance (members include Central Arizona Project, Denver Water, the Metropolitan Water District of Southern California, New York City Department of Environmental Protection, Portland Water Bureau, San Diego County Water Authority, San Francisco Public Utilities Commission, Seattle Public Utilities, Southern Nevada Water Authority and Tampa Bay Water). EPA has several programs addressing resiliency of infrastructure such as their CREAT software that enables utilities to evaluate the vulnerability of their assets to extreme weather events and broadly, plan resilient activities to reduce risks or EPA’s Community-Based Water Resiliency Initiative to assess resilience of infrastructure to service interruptions. See: [http://www.wucaonline.org/html/](http://www.wucaonline.org/html/), [http://water.epa.gov/infrastructure/watersecurity/climate/creat.cfm](http://water.epa.gov/infrastructure/watersecurity/climate/creat.cfm), or [http://water.epa.gov/infrastructure/watersecurity/communities/](http://water.epa.gov/infrastructure/watersecurity/communities/)

According to one recent analysis, there have been a little less than 200 recorded water rights transfers (short- and long-term sales and leases) a year over the period 1987-2007. See *Zachary Donohew, Property Rights and Western United States Water Markets*, The Australian Journal of Agricultural and Resource Economics, 53, pp.85-103, 2009.

Water use laws and conventions in Australia originally very similar to ours in the US underwent broad reform largely in response to sustained drought, which suggest a strong potential for learning and transfer. Australia’s federal Commonwealth government is responsible for policy leadership, planning, and funding while states are responsible for laws that govern water use and allocation of water rights within their states. Australia’s Water Management Act of 2000 created separate rights for extraction/diversion of surface or groundwater and for the right to use water at a specific place for a specific purpose. Using an extensive public involvement process, the Act also prioritized water uses in times of shortage, from highest to lowest: Domestic, environmental, commercial and urban uses, and irrigation. The Water Act in 2007 implemented Australia’s National Water Initiative, which among other things, created the Murray-Darling Basin Authority to coordinate basin planning and water management in this watershed serving about a quarter of the country’s population and most of its agricultural production across three of Australia’s five mainland states. For details, see the website of Australia’s National Water Commission at: [http://nwc.gov.au/](http://nwc.gov.au/)

For details on these issues and a general presentation of financial changes and challenges in the clean water sector, see National Association of Clean Water Agencies, *Two Sides of the Same Coin…Money Matters – Increased Investment and Regulatory Prioritization* (2011) and *The Message is Clear…Money Matters – Smarter Investment to Advance Clean Water* (2011)
The Water Resources Utility of the Future:
A Blueprint for Action  © 2013
Beautiful Nature, City of life, Friendly Community,

Twelve promises of Suncheon

SUNCHEON CITY, KOREA
THE COUNCIL OF GREEN SUNCHEON 21
‘Dazzling nature, City of life, Friendly community’

We embark to create a friendly, livable city of Suncheon. We have a lot to do. But we have selected the most important things as our promises. Here are twelve missions all the citizens, administrators, private sector and civic organizations must work together to achieve.

They do not require ambitious visions or huge budget. They are feasible hopes as well as our action plans to raise the quality of life for citizens based on our natural, historical and cultural assets.

First, we are going to enhance the value of our beautiful natural assets. A nature-harmonized, healthy urban environment presents a spacious garden for all the citizens. We want to preserve Suncheon Bay, god-blessed habitat for hooded crane and the pride in unpolluted coastal ecosystem, and crystal clear Dongcheon stream where sweet fish leisurely swim around as it did long time ago by recovering the water-flowing downtown. The forest is not only a resting place of all lives but also future of the city.

Second, we are going to build a lively living environment. An urban environment must be in harmony with mountains, waters and human life. To inbreath vitality into every corner of the city, we need to make pedestrian-friendly streets rather than pass by in a car through more friendly traffic conditions.

Local agricultural produces must be actively traded within the region. Fresh agricultural products secure the health for urban dwellers and result in reciprocal development of both the rural and urban areas. On the other hand, the effective recycling system will reduce the living cost for the people while increasing their expenditure in enjoying leisurely time.

Third, we are going to revive a friendly community, the backbone of human living. We need to elevate the pride of citizens by inspiring the soul of a thousand-year-old village and historical spirit into every corner of the city. Citizens must participate in education and culture so that the self-achievement permeates through the sentiment of community, thus making their life enriched. Our old years will be happier in the city than any other place with live community culture.

Lastly, we are going to stress the citizens’ power is a true mover behind changes in an era of autonomy. Participation and service are the catalysts that achieve right autonomous public administration and the
starting point of true love that bridges you and me.

Suncheon, a city of proud citizenship.
Friendly community that achieves a lot with austere budgets, shows no agitation in downturn national economy, and enable to overcome hardships together.
Suncheon is a place you have dreamed of living in.

Spring, 2007

**Introduction of Green Suncheon 21 Indicators**

When the regional autonomy was introduced in 1997, the citizens, public authorities and the private sector joined to organize Green Suncheon 21 committee with an aim to build a livable region and came up with 21 indicators in 4 areas that contained a sustainable future of the city.

As Agenda 21 was adopted in United Nations Conference on Environment and Development (UNCED) and recommended it to local autonomous authorities, activities to satisfy those indicators were initiated. Currently, about 7,000 cities in 113 nations all over the world and 230 cities in Korea are following the recommendations.

However, Green Suncheon 21 indicators established in 1997 have not gone well. It is attributed to unstable settlement of local autonomy and poor understanding and awareness of main players of action. In addition, with time, the indicators needed to be revised or changed due to the social environment which is different from when they were established.

**Establishing new indicators**

New indicators were selected in 12 areas of 3 sectors based on opinions of citizens collected in the public discussions, experiences of participants and professional opinions having participated in Green Suncheon 21.

Aggressive reflection in the policymaking on the side of public administration is the requisites for implementing new indicators. Voluntary participation by civilian organization, civic groups and the private sector is the must as well. More than anything else continued practice and regular inspection should back up all the activities. Continued participation of all citizens in the indicator activities is deeply appreciated.

2 Livable Suncheon Indicator
Twelve promises
12 indicators

• Beautiful nature
  01 Ecosystem  Suncheonman Bay where cranes comfortably stay
  02 Rivers  Dongcheon where sweet fish come back
  03 Forest  Green forest we grow all together
  04 Greenery  Parks where children love to play

• City of life
  05 Urban environment  Open sky, uninterrupted passage of wind
  06 Transportation  Pedestrian-friendly downtown with green modes
  07 Rural area  Healthful recipe with local agricultural products
  08 Resources  Effective recycling of wastes

• Friendly community
  09 Culture  City of proud history and enriched culture
  10 Education  Life-long educational venue for all
  11 Welfare  Happy hometown for the old
  12 Citizenship  Citizens willing to volunteer
Sector 1 | Natural environment

Beautiful nature

Ecosystem 1. Suncheonman Bay where cranes comfortably stay
Rivers 2. Dongcheon where sweet fish come back
Forest 3. Green forest which we grow all together
Greenery 4. Parks where children love to play
Suncheon’s promise 1

01

Where cranes comfortably stay,

Land of reeds, expansive tideland, untarnished coastal ecosystem,
It is Suncheonman Bay.

Hooded cranes, endangered winter migrating birds, come to pass the winter. More than 200 species
of birds including Eurasian oystercatchers, internationally preserved birds, come to the area as well.
Suncheonman Bay became a well-known site for its well-preserved eco-environment. Now the main
concern is human who may unknowingly expel those precious birds.
Can you imagine an ecological park without cranes?
So, we place priority on the preservation of ecological resources rather than development or utilization
by taking the hooded crane, a symbol of Suncheonman Bay, as representative indicator of sustainable
ecological management.

Goal
• To increase the hooded crane population by protecting their habitat
• To preserve coastal wetland ecosystem by monitoring the changes in bird species

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<th>2009</th>
<th>2010</th>
<th>2012</th>
<th>2015</th>
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<tr>
<td>No of natural monument birds</td>
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<td>Total number of Extinct animals Grade 1 and 2</td>
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O Major indicator - No of hooded cranes observed in the wintertime
O Auxiliary indicator - Major migrating birds that appear in Suncheonman Bay:

• Natural treasures: 10 species including Hooded crane (No. 228), Chinese Egret (No. 361), Oriental Stork (No. 199), Black-faced spoonbill (No. 206), Whooper swan (No. 201), Eurasian oystercatcher (No. 326), and Mandarin duck (No. 327)
Current status and direction of improvement

Suncheonman Bay, designated as wetland preservation area by Ramsar Convention in 2006, is a clean sea surrounded by Yeosu Peninsular and Goheung Peninsular. It has high production and multiplication potential of marine biological resources. Three streams, Okcheon, Isacheon and Dongcheon come into the bay and have an expansive reach where water-friendly plants such as sedges, pampas grass and reeds flourish. In particular, reeds cover about 50ha, working as natural purifier of household wastewater. They are the most common native plants.

As the natural conditions of Suncheonman are perfect for habitats of various wetland animals, many waterfowls are inhabited in the area. Internationally, the area is one of the major migrating routes. More than 200 species have been observed in Suncheon Bay for the past decade including ten animal species of natural monument, seven species of Grade 1 of endangered animals and plants and 22 species of Grade 2. More than five species fall in with the categories established by the Ramsar Convention.

The species diversity in Suncheonman Bay refers to the soundness of marine ecosystem. Continued observation of rare or endangered birds appearing in the bay will be ultimately an indicator to tell if the ecosystem is destructed and if any countermeasure is needed.

Things to Do...

- Research wetland ecosystem regularly.
- Run an ecoparks placing priority in natural preservation in Suncheonman Bay
- Build an educational site and exclude mass tourism.
- Do not install mass tour facilities in the vicinity of Suncheonman Bay considering that the bay is a precious habitat of hooded crane
- Leave behind grains on the fields after harvesting
- Find out ways to increase profits for the citizens through preservation of Suncheonman bay
- Build cooperation with environmental organizations and experts
- Designate the hooded crane as the symbol of environmental-friendly Suncheon City
- Promote the hooded crane as the symbol of clean agricultural produce
- Provide periodic ecological programs regarding tidelands and birds
Dongcheon where sweet fish come back

The river that flows through the city is the yardstick of urban living.

When can we enjoy swimming in Dongcheon?

Sweet fish that disappeared in late 1980s from Dongcheon is selected as an indicator species for water quality improvement.

Dreaming of silver-shining homecoming,

It will be the core project that embodies beautiful nature of our hometown.

Goals

- To improve water quality by preventing household wastewater from flowing into Dongcheon
- To build a natural watercourse with fish ladder to improve a living environment for sweet fish

Water quality improvement for Dongcheon - Target year: 2010

(Unit: mg / l)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Dongcheon 1</th>
<th>Dongcheon 2</th>
<th>Isacheon</th>
<th>Measuring point</th>
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<tr>
<td>DO</td>
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<td></td>
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<td>[Dongcheon 1] Seonpyeonggyo, Seonpyong-ri, Seo-myeon</td>
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<tr>
<td>BOD</td>
<td></td>
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<td>[Dongcheon 2] Confluence in Hongnae-dong</td>
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<tr>
<td>COD</td>
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<td>[Isacheon] Yangryulgyo</td>
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<tr>
<th>Sub-criteria</th>
<th>2004년</th>
<th>2006년</th>
<th>2007년</th>
<th>2008년</th>
<th>2015년</th>
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</thead>
<tbody>
<tr>
<td>Household wastewater collection length (km)</td>
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<tr>
<td>Appearance frequency of indicator species</td>
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〇 Auxiliary indicators

- Fish species living in cleanupstream: Korean bullhead *Pseudobagrus fulvidraco*, *Liobagrus mediadiposalis*, *Coreoperca herzi*
- Research into anadromous species affected by a reservoir (for example, eels)
- Identification of appearing water quality index species through the study of fish fauna

Current state and improvement ...

Since late 1990s, the research of fish fauna has been underway in Suncheon and its vicinity. But overall information on the lists of fish fauna and representative species by river in the whole city is far from enough. To summarize information on fish fauna of 1998, about 34 species were observed in three areas (Sohacheon, Isancheon, Beolgyocheon), of which 12 endemic species were caught. The number of appearing species was relatively low, 23%, in comparison with 147 endemic species of the whole nation. The ratio of endemic species was relatively high.

In Dongcheon, endemic species collected were seven species in four families of two orders. Customization frequency is 25%, similar to that of the whole nation. The main culprits that block sweet fish from returning to Dongcheon are poor water quality and interrupted fishways. Looking into the stream, it seems that a reservoir becomes a stumbling block to the upstream movement of fish. Although the natural conditions are recently rated good in Dongcheon, continuous efforts are needed to reduce pollution and keep rivers healthy through the regulations and controls with index species.

Things to Do...

- Recover a natural function of an ecological river by turning natural rivers and building fishways
- Designate base points for the research of fish fauna and continue the investigation
- Raise the collection of household wastewater and prevent it from flowing into Dongcheon through leaks in pipes
- Reduce chemical detergents in households by proliferating use of environmental friendly detergent
- Develop river exploration programs and educate/promote the preservation of reaches
- Stage civilian campaigns and activities to preserve Dongcheon
- Keep an eye on the appearance of water quality indicator species
- Check the degree of pollution and water quality on a quarterly basis and take steps
Suncheon’s Promise 3

03 Green forest which we grow all together

A forest is the very source of all lives. A forest is a reservoir of resources like wood, clean water, fresh air and a nest for animals and plants. Just as we cannot think of the present without a forest, the evergreen future stems from the forest we grow today.

School forest, village forest, eco forest...
Efforts for fostering forests cannot be too enough.
Let citizens participate in forestation from the very beginning.
Therefore, let all citizens share and enjoy the benefits of forests.

Goal
• To double the tree-covering ratio within ten years

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<tbody>
<tr>
<td>Urban forest</td>
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<tr>
<td>School forest</td>
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<td>Village forest</td>
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<tr>
<td>Borderline tree-planting between roads and sidewalks</td>
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<td>Forest fostering (Area)</td>
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<tr>
<td>Scenic forest (Area)</td>
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<td>Length of hiking path (length)</td>
<td>2,000</td>
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Current state and improvements...

We have been making lots of efforts to keep our city green. Although we have made achievements such as planting trees on streets, rose vine in Yeonhyang-dong and zelcova trees in tree lawns. However, it was not satisfactory. The quality of forests is not good due to poor forest making and fostering efforts. The park forest preservation projects like tall tree planting for landscape, tree fostering, urban park remodeling, part facility improvement, weeding-out, pruning, control of damages by blight and insects are underway, but there is no plan for preserving established urban forests. As utility of urban forests is different from their locations, the management plans are important. So, systemic management of urban forests should be followed like the nature of visitors dictating tree types and facilities, and green zone types that controls urbanclimate.

The land for park green spaces is important, but it should not be limited to the land. New green spaces in a park are like hardware. Much consideration should be given to quality of plants. If proper trees are not planted in buffer areas or many shrubs that do not give shades are planted in a park, the quality of plants in a park will deteriorate. Urban forests should have trees with wider canopy or tall trees to improve forest quality. Keeping soil healthy also improves forest quality.

Things to Do...

- Collect opinions of civilians when building forests and parks
- Wage forest-fostering civilian campaigns such as tree donations
- Create a private culture of planting a tree in anniversaries or memorable days
- Stage urban forest fostering campaigns like school forest, village forest, scenic forest
- Form 60 cm tree lawn between sidewalk and roadway
- Stage campaigns for nearby mountains.
- Establish a route where explanations are given to the natural environment
- Wage one company-one forest campaign
- Plant grass or trees that can be foods for wild animals
- Lead civilians to participate in forest-fostering campaigns
- Establish woods near village and preserve old and tall trees
Suncheon’s Promise 4

04
Parks where children love to play

« Wishing a spacious yard even in a small house... »

Green spaces and parks are the places that enrich lives of citizens, not to mention their environmental values.

Well-built path in a forest, diverse seasonal cultural events
All this will help citizens share with neighbors.

A park which attracts children who are addicted to computer games
A park which helps keep families healthy
A city can only breathe with green spaces.

Goal  • Increase urban park area up to $6^2$ per capita in ten years.

<table>
<thead>
<tr>
<th>Major indicator</th>
<th>2005</th>
<th>2006</th>
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<td>Urban forest</td>
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<th>2007</th>
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<tr>
<td>Area of greens</td>
<td>178,044$^2$</td>
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<tr>
<td>Area of biotopes</td>
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<tr>
<td>Tree lawns and no of small parks</td>
<td>103</td>
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<tr>
<td>Eco-green networking</td>
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- Major indicators
  - Area of urban parks: Including parks to be built and excluding park cemeteries

- Auxiliary indicators
  - Area ratio of greens to be made: Area of greens / area of designated greens
  - Area of biotopes: Area of living creatures / projected land area
Current state and improvements

There are 103 parks designated covering 9.179 km² in our city including urban parks. But only 55 parks (53.4%) stretching 0.244 km² (0.03%) have been built. Neighboring parks where urban dwellers often visit take up meagerly 7.5% (0.141 km²) of total area. Only 34 green zones (178,044 m²) are built out of 74 zones (2,229,989 m²), accounting for only 8%. Such poor performance can be attributed to high land compensation cost. Another reason for long-delayed parks are existing irrational facility plans and reduced feasibility due to changes in the neighboring environment. Therefore, thorough investigation is essential.

Urban parks are divided into theme parks and downtown parks. In 2005, given neighboring parks and children parks, our city’s urban park area was 7.6 m² per capita as our population is 270,980 person. The number was higher than 4.8 m² of the national average, but considering the parks made, it was only 0.9 m².

There have not been any research or studies on the relationship among park greens. It is often found that parks greens are not connected. Bonghwasan Natural Park located at the center of our city is disconnected with Mt. Baikun by Nanhwa Highway and National Road No.17 and only led to Mt. Nanbong by Okcheon and Hwangrimcheon. This is true of neighboring parks or children parks that were built. Moreover, greens are not connected in the old downtown due to lack of street-lining trees or living hedges except trunkroads. It resulted from the imbalance of park green layouts between old and new downtowns.

Things to do

- Increase park area by implementing delayed urban park projects
- Turn small idle land in the city into pocket parks by making use of the green land use contract system
- Minimize devastation of greens in carrying out development projects
- Encourage participation of citizens in building parks and greens
- Attract diverse cultural events into parks
- Establish an urban green network through greenery map making, restoration and connection
- Plant trees in yards of houses and place flower pots in front of stores
- Afforest factories and workplaces
- Build habitats for various animals and plants

12 Livable Suncheon Indicator
Sector 2 | City

City of life

Urban environment  | 5. Open sky, uninterrupted passage of wind
Transportation     | 6. Pedestrian-friendly downtown with green modes
Rural areas        | 7. Healthful recipe with local agricultural products
Resources          | 8. Effective recycling of wastes
05
Open sky, uninterrupted passage of wind

Let's look down to our place from high above.
A place of work, a place of sleeping, a place of eating, cities, rural areas, buildings, rivers, streets...
Mountains, water.... Are people and the nature in harmony and comfort?
Do they enjoy their cultural and natural heritage?
Do the unique colors and characteristics glow from every corner of the city?
Where are we going to start?
Let's mend our system first and focus on changing the landscape of our city.
Let citizens feel that they can change their places through cooperation and unity.

Short-term goal • Attractive, pleasant city: Harmony of mountains and water, and people and the nature Project course
• City that bridges history and culture: History - Preservation of cultural resources and use of scenic resources
• City that restores the nature-Strict conservation of greenery and environmental friendly development
• City that exudes uniqueness: Symbolizing the uniqueness using landscapes resources

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<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Enactment of landscape acts</td>
<td></td>
<td>Evaluation items (examples of questions)</td>
</tr>
<tr>
<td>Enforcement degrees, Deliberation committee</td>
<td></td>
<td>• Build a unique downtown street</td>
</tr>
<tr>
<td>Form a task force team</td>
<td></td>
<td>• Manage and use historical/cultural landscape</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td>• Control outdoor signage</td>
</tr>
<tr>
<td></td>
<td>70</td>
<td>• Control urban colors and nightly/lightings landscape</td>
</tr>
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<td></td>
<td>60</td>
<td></td>
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<tr>
<td>Auxiliary indicators</td>
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<td></td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Citizen satisfaction index</td>
<td>2007</td>
<td>2008</td>
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14 Livable Suncheon Indicator
Current state and improvement

With the increased living quality, urban landscape has emerged as a factor of urban competitiveness to heighten refinement of citizens in addition to pleasant and beautiful living conditions in an era of local autonomy.

The downtown of our city is surrounded by mountains, so it gives diverse seasonal landscapes. Dongcheon and Isacheon that run through the downtown, and Suncheonman Bay where the two rivers become the backbone of waterside landscape which is leisurely and beautiful. In the vicinity of our city are various landscape resources like Nakan Eupsung Folk Village that has historic and cultural features, Seonam Temple and Songgwang Temple at Mt. Jogye and Juam Lake that will give an image of historical and cultural city where visitors can easily meet with historic and cultural relics.

However, our city has pursued uniform land use plans or myopic, two-dimensional area divisions that focused on economy and functionality, not considering regional characteristics and urban uniqueness. Highly dense urban expansion and chaotic development of inner and outer city destroyed the city topography. The incongruous balance between the urban skyline and space deployment becomes worse. Commercial areas mingled with residential areas due to focus on commercial development, thus deteriorating living quality. The landscape of streets lost their unique colors and flavor. It is hard to find urban identity due to loss of precious living cultural assets as historic and cultural asset management was considered unimportant.

Given the current state, we established short-term, realistic indicators. Major indicators are about the improvement systems of urban landscape. The goals are not quantified figures, but the directions of landscape structure that can highlight unique characteristics of our city. We limited auxiliary indicators to downtown landscape that can engrave an image of our city quickly. We hope that the positive change penetrate citizens' lives and enhance the urban landscape.

Things to Do...

- Focus on establishing systems such as enactment of landscape acts and forming a deliberation committee
- Build a specialized theme landscape by region as with the landscape agreement system
- Set up a department and system that are in charge of downtown landscape
- Stage campaigns for rooftop greens of large-scaled buildings and smash downwalls of public facilities
- Introduce unique design to urban public facilities that considers regional characteristics
- Encourage civilian volunteers to manage local historic, cultural sites and streets
- Hold regular monitoring and reporting meetings for the enhanced landscape
- Wage a movement to find a beautiful landscape by village
Pedestrian-friendly downtown with green modes

The core of traffic problems is not exhaust gases, pollution or traffic jam, it is a human that is responsible for.

No matter how many pollution-free automobiles roll on the roads, we cannot avoid car accidents or traffic jams in the situations like this unless we change road systems and traffic culture.

A few secret solutions are not enough to deal with the complicated traffic problems of the modern times.

However, it would be a shortcut for the present and the future that we build pedestrian-friendly streets, construct roads where green modes can run and create a culture that we refrain from using privately owned cars.

Goal

- To create a beautiful environment friendly road for green modes

<table>
<thead>
<tr>
<th>Division</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bike path (km)</td>
<td>63.2</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>250</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Traffic culture index (Rating)</td>
<td>65th</td>
<td>55th</td>
<td>45th</td>
<td>35th</td>
<td>15th</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What are green modes?

Green modes are pollution-free transportation modes unlike red modes that are equipped with motors like cars. They refer mainly to walking or methods using wheels such as strollers and handcarts.

Traffic culture index

The ratings announced by Ministry of Transportation and Korea Transportation Safety Authority (KOTSA) surveying 83 cities in 11 items of three areas (Driving behavior, transportation safety, walking behavior).
Current state and improvement ...

Suncheon has an increasing traffic population as the hub of the eastern part of Jeonnam. Registered vehicles numbered 64,575 units in 2000, and 85,410 units in 2005. The number of passenger cars increased over 20,000 units for the same period. The policies to deal with traffic-related problems such as environmental pollution and traffic congestion can be divided into the system development reducing car use, proliferation of mass transportation, and revitalization of green modes in terms of traffic demand control. Among these, revitalizing human-oriented green modes keeps citizens healthy and intreathes vitality into the streets. It can be called the solution that is closest to the ultimate elimination of traffic problems.

To make a city where riding a bike or walking down the street is a pleasant experience, a street environment must be dramatically improved. Eliminating illegal pullover or parking, gettingrid of things stacked on a street. Creating a clean street environment. increasing road system... and so on.

Traffic culture index is a useful yardstick to understand traffic culture of cities and the whole nation and can be used as a basis for policy making to usher in the advanced traffic culture. The index is total scores against a hundred mark of 11 items in three areas (driving behavior, traffic safety, traffic environment). It is announced every year. Our city’s index was 73.31 in 2004 and dropped to 71.19 in 2004, rating 76th, down 12 over the previous year, out of 83 cities. In 2005, werated 65th out of 85 cities with 76.75.

Things to Do...

- Designate Day of Green Modes once a month to encourage civilian participation
- Enact an act on the use of bicycle
- Improve service quality of mass transportation to raise satisfaction and usage
- Designate Car free zone and Car free day
- Establish a beautiful street where people want to walk along
- Create a pedestrian-friendly driving culture. Do not place things in a parkinglot or back streets.
- Find ways to solve lack of parking space in residential areas and buildpeople-friendly streets
Suncheon’s Promise 7

07

Healthful recipe with local agricultural products

Rural areas are the roots of cities and agriculture is the source of foods, which are the backbone of our lives.

As agriculture is apt to be affected by the nature, it urges rational land use apart from indiscriminate development. It is a buttress of the environment that preserves and provides tangible and intangible natural assets.

In particular, Suncheon is composed of both urban and rural areas. The agriculture is directly related to the local economy, not to mention health of citizens.

Agriculture is a bio industry that cannot be measured with comparative edges.

We should not see the crisis of agriculture in the context of unavoidable globalization.

Let’s make local agricultural produce actively traded in our region.

Rural areas that produce safe and healthy foods and urban area that consumes the foods with gratitude...

City of life !

Goal • To double the consumption of local agricultural produce in the city by 2015

<table>
<thead>
<tr>
<th>Item</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption of local produce in the region</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic farming area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Use of conventional marketplaces</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Sale of large-scale discount markets</td>
<td></td>
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</tr>
</tbody>
</table>

Current state and improvement ...

The role and importance of cities in agriculture have been ignored due to national systems and policies. Western societies embarked community food security and basic and civic rights to foods from the...
1980s in the realm of civilian society. In the 1990s, LocalFood Council was established to make food policies in private and public cooperation. Urban dwellers and authorities that consume foods produced in rural areas must feel the co-existence between urban and rural areas as parties of core agricultural issues.

The distribution and sale routes is key to agricultural society.

The expansion of environmental friendly agriculture, fostering of farm product processing/distribution industry, and expansion of welfare facilities in rural areas are ongoing issues. But, when agricultural products are not traded at fair value, agriculture and rural areas cannot but wane despite various prescriptions. Therefore, we placed focus of ‘Suncheon’s Promise’ indicators in selling routes of agricultural products. An evaluation criterion is how much nearby local community can consume.

A major indicator was the consumption of local agricultural products within the region. First, we selected a representative item and compared the local shipment of producers’ association and sales in large-scale marketplaces with the sales of other regions or sales of imported products. We selected use of traditional marketplaces as an auxiliary indicator because we needed to expand the role of traditional markets as a direct sale route of agricultural products and the traditional markets directly affect the circulation and revitalization of local economy. The use of traditional markets is indicated in the sales trends of major wholesale markets.

Things to Do...

- Produce safe and competitive foods through organic farming
- Wage a campaign to consume local products
- Encourage interest and participation of local consumers considering quarterly sales performance
- Revitalize direct sales markets through various incentive systems such as fostering grocery-shopping aids
- Form a relation with women’s associations of apartments by providing opportunities to experience environmental friendly villages
- Stage the campaign of associating one company with one village to consume local products
Suncheon’s Promise 8

08
Effective recycling of wastes

Let’s imagine
More dazzling showcases of recycled products than those of department stores
Our city turns wastes into money. If you litter, it becomes waste. If you collect, they are resources.
You can buy necessities at lower price, and you will have more financial room to enjoy your leisurely
life in return.
Let’s make as many efforts to firmly establish the recycling system as we try to attract industrial
facilities.
Simple and practical civilian culture preserves global environment and accelerates sharing with
neighbors.
Resources are limited on the planet called Earth.
Recycling, it is the very start of true love to hand good places over to our posterity.

Goal • To halve waste productions in ten years

<table>
<thead>
<tr>
<th>Waste production per capita (per day, Kg)</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2010</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.17</td>
<td>1.12</td>
<td>1.11</td>
<td>1.07</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. of people visiting recycling marketplaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,900</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Civilian environmental education (Times, No of participants)</th>
</tr>
</thead>
<tbody>
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<td></td>
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</tbody>
</table>

Current state and improvement ...

Our city produced 303.9 ton of wastes a day as of December 2005. About 1.11 kg of waste per capita,
such as combustible, non-combustible and food wastes, is generated in a day. Less and less wastes
are produced every year. Nevertheless, it is far short of OECD’s recommendation, 0.3 kg per capita a
day. Given the standard of 1995 when we had not implemented separate collection of food wastes.

20 Livable Suncheon Indicator
our city's wastes were generated three times as much as the recommendation. A major indicator is waste generated per capita. The changes are indicated in the waste generation every year.

To reduce wastes, we need to get rid of its sources. This means we have to change our consumption behavior or wastes should be turned into resources. In addition, we have to change our way of looking at wastes that can be resources and firmly established separate waste collection system must be in place. Wastes may be reduced depending on civilian enlightenment and action plans including strict separation of wastes, wastes-turned resources and no more chemical detergents. Therefore, an auxiliary indicator was Clean 2704 Marketplace; Use and reactivation of civilian environment education.

Frequent visits to recycling markets prove that recyclable items are actively traded and used through the markets. The reactivation of civilian environmental education indicates the need to revitalize civilian education to encourage recycling of wastes. The revitalization of environmental education is shown in the frequency of the programs and activity of natural guides, which can be called the barometer of civilian environment education.

Things to Do...

- Elevate the image of Suncheon as an environmental-friendly city by actively supporting exchanges of recycled items
- Come up with measures to reduce wastes by investigating volumes by type every year
- Set up Eco Center that can provide educational programs
- Foster companies that recycle wastes in Kwangyangman Bay area using the geographical advantages of Suncheon
- Develop various civilian educational programs and foster natural guides
- Provide diverse environmental education programs regarding wastes
- Try to run and revitalize recycling markets
- Use recyclable materials in production lines and facilitate separate disposal
- Make compost out of food wastes and strictly separate wastes from recyclable wastes

Livable Suncheon Indicator 21
Sector 3 | People

Friendly community

Culture
Education
Welfare
Citizenship

9. City of proud history and enriched culture
10. Life-long educational venue for all
11. Happy hometown for the old
12. Citizens willing to volunteer
Suncheon’s Promise 9

09

City of proud history and enriched culture

Well-established history and cultural city attract people.
If we can feel the pride and affection for the history and culture of our town whether we are native or foreign to the region, we will be part of the region and a member of the community, dreaming of the future.

Revive history and cultural resources of Suncheon.
Attract local artists to our city.
Let’s make our city and future more affluent with their enthusiasm, dances, music and hopes.

Goal
• To double budgetary resources of culture and arts by 2015
• To establish support systems for local artists

<table>
<thead>
<tr>
<th>Item</th>
<th>2006</th>
<th>2009</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>City-led artistic events (Year)</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>Budget for culture and arts</td>
<td>0.76%</td>
<td>0.90%</td>
<td>1.05%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Percentage of citizens enjoying</td>
<td>10%</td>
<td>15%</td>
<td>20%</td>
<td>25%</td>
</tr>
<tr>
<td>culture and arts</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
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<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>No of small group meetings</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>City • Universities • Cultural and art organizations</td>
</tr>
<tr>
<td>Expert fostering organizations/No of</td>
<td>Designate fostering organizations and draft no of attendees (100)</td>
<td>Implement and deploy education programs (200)</td>
<td>Institutionalize and expand fostering education (300)</td>
<td>Cultural and art organizations</td>
</tr>
<tr>
<td>participants</td>
<td></td>
<td></td>
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</tbody>
</table>

% Percentage of citizens enjoying culture and arts

Livable Suncheon Indicator 23
People who visited or participated in pure artistic events for music, fine arts, dancing, photographs, Korean traditional music and literature more than once a year

- No of small group meetings
- Cultural and art small group meetings. The reference year is 2007, making it 100.

Current state and improvement ...

Suncheon has been the Mecca of cultural and arts in the region called Namdo. We have many famous artists. In addition, Suncheon is a historic place. We have high cultural potential based on a variety of cultural heritage. Our stature as cultural city will be elevated if we can effectively preserve our cultural and historic symbols, encourage artists, and develop various characters to externally promote our city.

Refined urban culture is based on the cultural and artistic sentiment of citizens. Diverse cultural experiences stabilize the sentiment of community and enrich civilian life. To satisfy the civilian right to enjoy culture and arts, active interest and thoughtful consideration for local artists and professionals should be preceded. Fostering professionals on cultural and artistic education programs and supporting artists are effective investments to raise in tangible assets in the region. Lively activates of local artists will revitalize cultural meetings and accelerate quantities and qualitative growth of creativity activates and contests.

The maturity of culture and arts is hard to quantify due to the nature. An attractive cultural city will have many performances on streets. Audiences will not be detached from actors in any stage. So it was meaningless to measure the visit frequency to performance halls or expand exhibition facilities. The indicator focused on municipal budgets to urge an active role of city. It did not mean that we did not stress the expansion of basic facilities such as museums and libraries. We do believe basic facility will be expanded in the course of focusing budgets of culture and arts.

Things to do...

- Set up mid to long-term basic plans to expand cultural and artistic infrastructure
- Draft the support plan for fundamental artistic activities of local artists
- Research the enjoyment of culture and arts every two years
- Offer the subsidies, which was originally given to creativity art groups, to culture and art enjoyment organizations and groups
- Set up pocket parks in idle land and encourage cultural and artistic performances on streets
- Use spare space in public buildings and faculties for cultural events
- Foster professionals on culture and art education
- Encourage companies to sponsor education programs and events for cultural event enjoyments
Suncheon’s Promise 10

10
Life-long educational venue for all

‘Suncheon, City of education’ is the honor of the past and the ideal of the future.

Public education is not enough to achieve what the modern society requires. People should continuously develop their ability and talent to meet individual and social needs.

Life-long learning is a work, leisure and pleasure of self-realization at the same time.

A venue of life-long learning for anyone, anywhere!

Learning establishes warm households and awakens citizenship.

Let’s build a city of education where workplaces are full of vitality and people make their future.

Goal • To build a city of life long learning that results in local development and self-realization

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<tbody>
<tr>
<td></td>
<td>68,000</td>
<td></td>
<td></td>
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</tbody>
</table>

Percentage of budgets for life-long learning of the marginalized social classes:

No of specialized education programs: 5

No of citizens who lend books:

- Major indicators
  - No of participants in lifelong education programs run by various organizations

- Auxiliary indicators
  - Percentage of budgets out of total budgets for lifelong education for the socially marginalized classes such as low income families, the old, the handicapped, and foreigners
  - Programs that reflect culture and characteristics of local community
  - No of visitors to public libraries and small private libraries
Current state and improvement ...

Various forms of lifelong learning programs including on and off line programs should be provided to meet the needs for jobs, hobbies and self-development. Our city is running 250 courses in 2005, but there were only seven courses for the marginalized groups. We have one professional staff that is in charge of lifelong learning programs. So we are in lack of staffs that can scientifically develop the lifelong learning opportunities for the socially marginalized classes.

The value that lifelong learning pursues is the equal opportunity for self development and realization without anyone being marginalized. Therefore, lifelong learning programs should be provided with the educational equality in mind so that the marginalized people are not deprived of their opportunities for learning.

Lifelong learning centers are needed to provide opportunities and information. The centers should be easily accessible by phone or on the web and provide various programs all the time.

Our city has ample natural resources to foster manpower, such as Suncheonman Bay and Namdo Eupseong. By actively specialized lifelong learning programs that reflect opinions of professionals and citizens, regional development is promoted and vitality is injected into our city.

Things to Do...

• Develop their own talent and use lifelong learning programs that fit your hobbies
• Develop and run lifelong learning programs that can satisfy civilian needs for diverse lifelong learning programs including online programs
• Use professionals in systemically assist lifelong learning programs for citizens
• Lead regional development by specializing programs that fit for our city
• Increase opportunities and budgets of lifelong learning programs for the socially marginalized classes
• Establish lifelong learning centers that can organize the lifelong learning projects and form cooperative relationship with other agencies and authorities

26 Livable Suncheon Indicator
Suncheon's Promise 11

11
Happy hometown for the old

Low birth rate... The old days in the aging society are empty and lonely. Children living far away, friendly talks among family members gradually give way to digital culture. As we cannot imagine a family that does not respect for the old, there is no welfare policy that does not respect the old people. Welfare requires lots of budgets, but the city where people spend happy old days is not made with money. Family, neighbors, workplaces... let's revive a culture of get-together and create jobs to inspire wisdom and experiences of the senior citizens into every corner of our local community. Let's spend happy old years in the region by utilizing the benefits of a city composed of urban and rural areas.

Goal
- To expand social safety nets for old people who stay in nursery facilities for a long time
- To create jobs for senior citizens including voluntary works.

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</thead>
<tbody>
<tr>
<td>No of people who use welfare facilities in a year</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>No of welfare facilities for the old</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>No of people who use home helpers</td>
<td>23,200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No of old people who works</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>No of companies which provide jobs for the old</td>
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</tbody>
</table>

Current state and improvement ...

Social services for the senior citizens include counseling, information provision, service request, daytime care service, home care service, health care service, social support and so on. They can be divided into home-based service, community-based service and facility-based service depending on a place.
Currently, there are 228 welfare facilities in our city, of which ten facilities are only for the senior citizens. It is far from enough given the increasing number of the old and need for long-term care. Specifically, specialized free nursery facilities are Yeokwang Maul, Sungsan Nursing Home in Seokhyun-dong and Eunbit Maul in Sangsa-myeon. Other welfare facilities are Jorye Home helper dispatch service center and Inje home-helper dispatch service center. Daytime short-term nursing facilities are Jorye Daytime nursing center and Inje short-term nursing center. We need to greatly expand facilities and organizations that can provide services for the old and grow the home-helper dispatch services.

A job has great meaning for the old people. As part of efforts to create jobs for the senior citizens, social activities that take on volunteerism are very effective and can be one of realistic solutions as many people can participate. From the individual perspective, volunteerism brings back lost social roles, keeps positive pride in oneself, helps overcome isolation, achieves self-growth and realization, keeps old people healthy and enhances enthusiasm and satisfaction with their life. From the social perspective, it results in positive awareness of the old people and the aging, and eliminates adverse factors from the prolonged old days through the service and contribution to the social development.

The voluntary works of the senior citizens run by our city are 'Grandfather Voluntary Service Group', 'Silver Music Band' and 'Vehicle providing service group'. We will make efforts with an aim to offer more opportunities of voluntary services to make full use of experience and wisdom of the senior citizens and create more jobs for the senior citizens.

**Things to Do...**

- Reduce burdens on families by expanding long-term nursing care projects for the old
- Increase supports for families who take care of old people with dementia among those receiving long-term nursing care service
- Provide diagnosis and treatment for the immobile old people in cooperation with nearby public health centers
- Expand daytime care service and short-term care facilities
- Activate the home-helper dispatch service
- Actively participate in steering committee for long-term care service and volunteerism projects
- Provide full supports for the establishment of silver towns which are residential places of old people
- Secure financial resources for voluntary works of senior citizens and establish/lay the foundation for voluntary service centers
- Expand the realm of voluntary services and develop programs
- Establish legal and social support systems for old volunteers
- Create the environment for old volunteers in local community and public organizations take the lead.

28 Livable Suncheon Indicator
Suncheon's Promise 12

12
Citizens willing to volunteer

Dream of Day of Suncheon
First Friday of every month is Day of Suncheon.
Children get up early and sweep their neighborhood.
Adults go to work walking on foot, taking by bus and riding a bike instead of driving their own cars.
Festivals for the old people are held in areas which cars give up.
There are festivals not colorful but full of things to see and eat.
There are many things to enjoy as silver clubs host the shows.
Saturday, the next day, is Day of recycling. Recycling markets are held in areas.
Juvenile street shows are held in the evening.
All this happens in the Day of Suncheon.
It takes time and efforts to collect willingness of participation.
The collected willingness will open the era of true local autonomy.
A community that is not affected by shaky national economy.
A community that does a lot with small budgets
A community that shares difficulties
A place of live citizenship
This is a place called Suncheon.

Goal • To run provisional Day of Suncheon every month, Day of civilian participation

<table>
<thead>
<tr>
<th>Participation in Day of Suncheon</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livable Suncheon Indicator 29</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Direction of implementation...

For steady performances
- Form a department that is in charge of events
- Encourage voluntary participation rather than mobilization
- Start small events without great efforts and expand the scale every month
- Use various media for promotion such as signboards on trunk roads
- Motivate civic organizations and civilian groups to participate voluntarily

For Car-free Day
- Give special motivation to people who go to work to participate aggressively
- Update the list of companies participating through CATV or other promotional media like billboards
- Attach the sticker ‘Aha, Suncheon Day’ on cars to stimulate sense of participation
- Deploy old volunteers in yellow vest that says « Volunteer for Day of Suncheon »
- Designate Car-free Day on back streets in downtown that have least passing traffic and run programs
- Expand the area for Car-free Day

For beautiful volunteerism
- Make volunteer a daily necessity for children and youth
- Plan creative voluntary works for senior citizens to use their experience for the community
- Let old volunteers take over village sweeping movements done by children or teenagers
- Make teenagers spend their voluntary hours on Day of Suncheon
- Give out Mileage stickers for voluntary works on Day of Suncheon
- Give the pilot performance to ready villages and expand the events
- Symbolize Day of Suncheon as a day when citizens can be proud of by expanding the events

30 Livable Suncheon Indicator
Suncheon’s Promise, achievement of goals

Indicators assume implementation. It is hard to fulfill indicators without practice, and a sense of purpose. There must be a department that can oversee the implementation of indicators and a channel to communicate with civilians.

Efforts of all social members are required to fulfill the indicators. For example, to increase streets with green modes, opinions from bike riders’ groups as well as policy making are needed. New trials should be continuously made such as using grocery-shopping helpers to revitalize traditional marketplaces.

The indicators should be evaluated and revised every year. The detailed implementation will be shown in various numbers and forms. As the evaluation items in ‘Suncheon’s Promise’ are not enough to study the changing reality, indicator-specific evaluations jointly by professionals, civilian organizations and civil organizations should be included.
Suncheon's Promise, Our promise

New indicators, 'Suncheon's Promise is paraphrased words of Local Agenda 21 of making sustainable region that is adopted in many regions and nations. We have compiled the detailed reports on sectors and the summarized volume contains twelve promises as core indicators.

Suncheon's Promise is not a promise among people. It is a promise of Suncheon with the globe to make a sustainable place for human and the nature. It is a work to refine our assets to be handed over to the next generation.

Beautiful nature, City of life, Friendly community...
This is what Suncheon will make.
Taking sustainable steps on sectors

- the globe to

be handed over

Beautiful nature, City of life, Friendly community...
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COMMISSION POLICY

SECTION 1: OUTCOMES POLICIES

Category: Outcomes Policies
Title: Global Outcomes Policy
Policy Number: O – 1
Adopted: 09-28-2017 (original adoption date)
Revised: 09-27-2018

District customers are confident that the regional sewerage system delivers appropriate benefits for public health, the environment and the economy at an acceptable cost.
Madison Metropolitan Sewerage District
COMMISSION POLICY

SECTION 1: OUTCOMES POLICIES

Category: Outcomes Policy
Title: Wastewater Collection and Treatment
Policy Number: O-2A
Adopted: 09-27-2018
Revised:

Customers’ wastewater is collected and treated in a manner that is consistently safe, reliable, efficient, environmentally responsible and forward thinking.
Natural resources are conserved, recovered and used in an environmentally responsible manner.
Madison Metropolitan Sewerage District
COMMISSION POLICY

SECTION 1: OUTCOMES POLICIES

Category: Outcomes Policy
Title: Financial Sustainability
Policy Number: O-2C
Adopted: 09-27-2018
Revised:

Charges for service are justified, adequate, equitable and predictable.