



Washtenaw County Support Services
- Facilities Management Division -

Preventative Maintenance Work Plan

Final Draft
August 10, 2007



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Table of Contents

Purpose of this Work Plan	3	Strategy 4: Continuously improve maintenance processes	13
Washtenaw County Vision and Guiding Principles	4	9. Data drives decision-making and scheduling.....	13
How This Project Supports Washtenaw County’s Vision	5	10. PM checklists are up-to-date for each piece of equipment	13
Implementation Schedule	6	11. Establish expectations	14
Strategy 1: Organizational processes support balanced preventative and demand maintenance.....	8	12. Develop an enhanced PM work plan	14
1. Scope of services optimizes FM scheduling	8	13. Initiate comprehensive PM	15
2. Optimize staff utilization	8	Strategy 5: Customers support maintenance initiatives	16
3. Leadership supports staff.....	9	14. Keep customers informed about PM initiative.....	16
Strategy 2: All maintenance work meets or exceeds quality standards	10	15. Departments track pleasantness of experience	16
4. Conduct monthly audits	10	Example of Performance Tracking	17
Strategy 3: Tririga supports all FM functions	11	Characteristics of Key Performance Indicators.....	18
5. Tririga tracks all maintenance work.....	11	Continuous Improvement Cycle.....	19
6. All FM staff use Tririga for PM	11		
7. Tririga provides necessary performance data.....	11		
8. Tririga handheld solution in place.....	12		



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Purpose of this Work Plan

This work plan lays out the strategies for enabling maintenance staff to work in a planned and organized way.

By completing all preventative maintenance work on time, we will reduce the number of equipment breakdowns and the need for emergency maintenance work. This will free both staff and funds for completing planned maintenance and project work. In addition, we will be able to provide more accurate life expectancy estimates of the county's equipment.

What this means for our customers

Our customers will experience fewer unscheduled outages and downtime due to equipment failures.

What this means for our community

Our community will enjoy more pleasant environments in which to conduct business with the county.

Our community will enjoy more uninterrupted county services.

Our community will enjoy more or higher level of services as we free up funds for other county services by reducing the cost of operating county facilities.

Success Indicators

We know we are successfully accomplishing the goal of this plan, when we complete all preventative maintenance work on time while taking care of emergencies and attending to other planned demand maintenance and project work.

Gordon Burger

Director of Infrastructure and Planning

Dale Vanderford

Director of Technology and Operations

David Shirley

Operations and Maintenance Manager



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Washtenaw County Vision and Guiding Principles

County Vision

Washtenaw County will be a world class service provider.

To do this we must be a leader in:

- Developing innovative prevention approaches to dealing with governmental responsibilities
- Facilitating cooperation and collaboration aimed at enhancing services
- Increasing the effectiveness and efficiency of mandated services

The foundation of this vision is:

- Sound fiscal management so we can rise above a "crisis" mode and have long-term stability
- An inspired and involved workforce equipped with the skills, knowledge and resources to provide world class service

County Guiding Principles

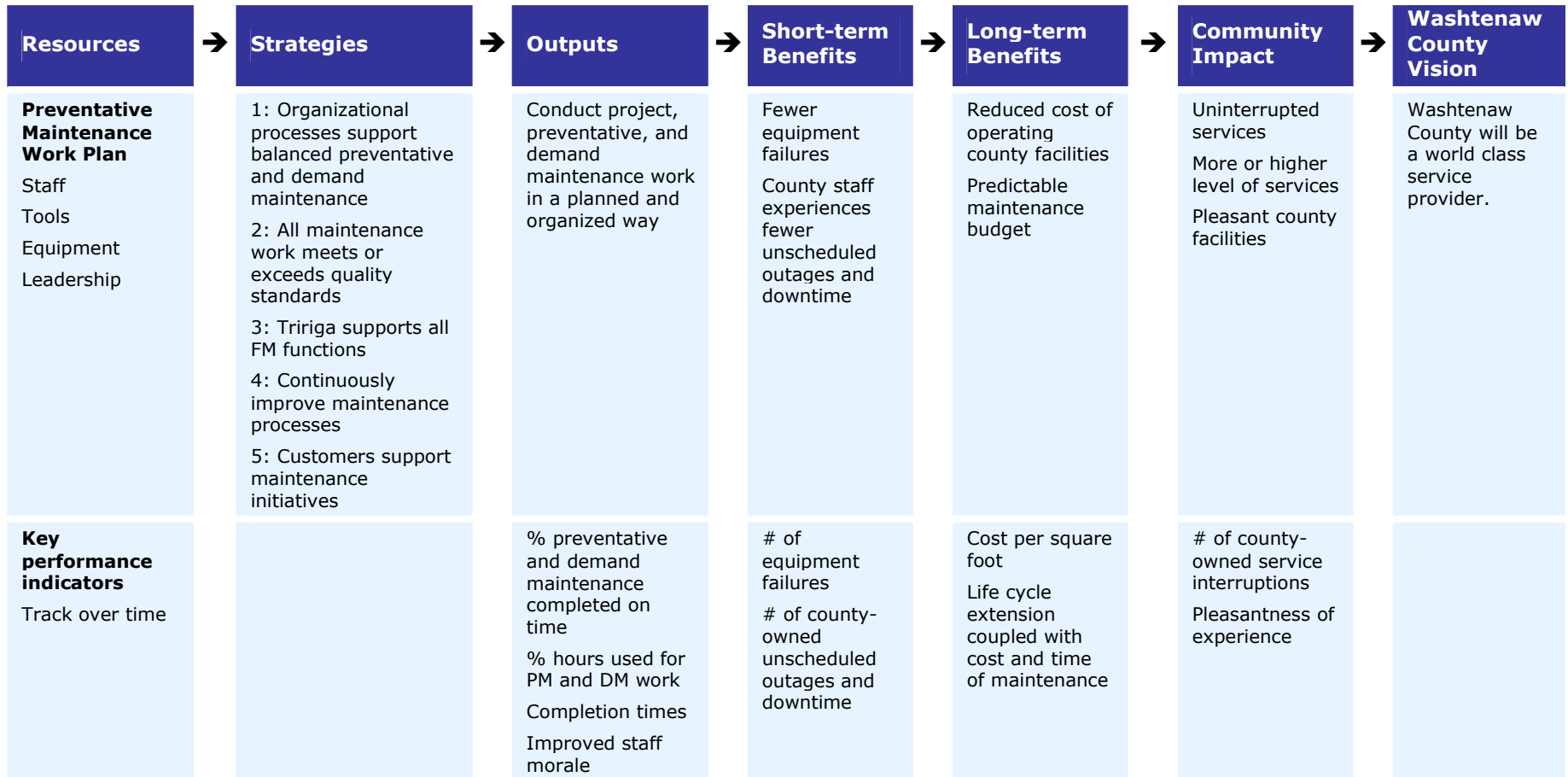
1. Ensure long term fiscal stability for the County.
2. Reduce the cost of conducting the County's business.
3. Enhance customer service.
4. Provide the necessary knowledge, skills and resources to County employees to carry out these principles.
5. Ensure adequate provision of mandated services.
6. Focus on the root causes of problems that affect the quality of life of County citizens by aggressively pursuing prevention strategies
7. Provide leadership on intragovernmental, intergovernmental and intersectoral cooperation and collaboration aimed at improving services to County citizens.



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

How This Project Supports Washtenaw County's Vision





Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Implementation Schedule

I.D.	Action Items	2007		2008				2009			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
13	Tririga tracks all preventative maintenance categories.	08/10									
5	Conduct DIN person pilot project	08/13									
7	Communicate frequently with staff	09/01									
12	Tririga will be able to track PM tickets different from DM tickets	09/01									
18	Develop Tririga KPI tracking system for supervisor roll-out	09/01									
20	Maintain KPI tracking system in Tririga	09/01									
1	Review current demand work items with all staff	09/06									
27	Clearly communicate staff expectations regarding continuous improvement of maintenance operations	09/06									
4	Utilize Do-It-Now (DINs) persons for emergency work	09/06									
2	Complete list with demand and preventative maintenance tasks FM will provide and timeframes	09/21									
6	Contingencies in place for optimizing staff utilization - As needed		10/01								
8	Supervisors schedule all PM work		10/01								
17	Provide Tririga training to current and new staff		10/01								
19	Develop Tririga KPI tracking system for staff roll-out		10/01								
25	Create initial set of PM checklists for skilled trades and maintenance techs		10/01								
33	Plan in place for ramp-up communication		10/01								
33	Communicate changes to department heads and elected officials		Oct								
33	Communicate changes throughout organization (manager meetings, Group of 180 meetings, building liaisons, other)		X								
10	Conduct monthly maintenance audits		11/01								



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

I.D.	Action Items	2007		2008				2009			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
11	Conduct monthly skilled trades audits		11/01								
19	First monthly report from Tririga		11/01								
22	Use monthly reports of key performance indicators to adjust DM and PM workload and staff assignments		11/01								
14	Add snow removal to Tririga		11/01								
21	Decide whether and when to employ Tririga handheld solution		12/31								
	Implementation roll-out			1/1							
34	Plan in place for ongoing communication			1/1							
15	Tririga allows streamlined entering of tickets					09/01					
16	Tririga allows entering of measurements taken on equipment					09/01					
29	Create an on-demand replacement schedule in Tririga					09/01					
30	Create an on-demand equipment repair history					09/01					
31	Tririga tracks required performance indicators					09/01					
28	Identify additional PM tasks that can be implemented at later cycles					09/01					
24	Create up-to-date PM time estimates for each piece of equipment							1/1			
35	Departments track facilities' pleasantness on their POS surveys							1/1			
9	Regularly assess staff morale and identify trends						Q4				
3	Update partnership agreements with all departments							Q1			
32	Institute fixed schedule for completely replacing items by building							Q1			
	Ongoing										
23	Track any process changes through Tririga-supported data										
26	Continuously update PM checklists - Ongoing after first PM cycle										



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Strategy 1: Organizational processes support balanced preventative and demand maintenance

Objective	Action Item	Responsible	Target Date	Notes
1. Scope of services optimizes FM scheduling	1. Review current scope of demand work items with all staff	Dave Shirley	09/06/2007	All staff meeting
	2. Complete list with demand and preventative maintenance tasks FM will provide and timeframes <ul style="list-style-type: none"> • Saved time will help optimize FM scheduling 	Dave Shirley	09/21/2007	List scope of work per Facilities, IT, and Outsourced
	3. Update partnership agreements with all departments	Dave Shirley	Q1/2009	
2. Optimize staff utilization	4. Utilize Do-It-Now (DINs) persons for emergency work	Dave Shirley	09/06/2007	Determine at 9/6 staff meeting if DINs persons can be rolled out
	5. Conduct DIN person pilot project <ul style="list-style-type: none"> • Gary will assign one staff per week for four weeks to emergency demand work only – Tuesdays through Thursdays. The other three staff will be doing planned and scheduled PM work. • Success Measure: 100 % of tickets completed with less stress • Pre-requisites: All work will be ticketed, and 100% of tickets will be entered in Tririga 	Garret Brown	08/13/2007	Gary will ask staff to write down what is working well/not so well
	6. Contingencies in place for optimizing staff utilization <ul style="list-style-type: none"> • Overtime • Assign PM person only • Utilize vendor support 	Dave Shirley	10/01/2007	Use as needed



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Objective	Action Item	Responsible	Target Date	Notes
3. Leadership supports staff	7. Communicate frequently with staff <ul style="list-style-type: none"> Weekly: Team meetings Monthly: Updates to teams (in person or via email; refer to Support Services score board) Hold quarterly all-staff meetings 	Dave Shirley Supervisors Dave Shirley Dave Shirley	09/01/2007	
	8. Supervisors schedule all PM work <ul style="list-style-type: none"> Supervisors receive PM tickets at the beginning of each month, then distribute work to staff per location Staff schedules their own PM work 	Supervisors	10/01/2007	
	9. Regularly assess staff morale and identify trends	Dave Shirley	Q4/2008	Next Organizational Capacity Survey Compare results against Q4/2006



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Strategy 2: All maintenance work meets or exceeds quality standards

Objective	Action Item	Responsible	Target Date	Notes
4. Conduct monthly audits	10. Conduct monthly maintenance audits <ul style="list-style-type: none"> Perform monthly building walk-throughs to check previous month's PM work 	Maintenance supervisors	11/01/2007	
	11. Conduct monthly skilled trades audits <ul style="list-style-type: none"> Randomly review previous month's completed PM checklists and conduct PM spot checks Supervisor uses discretion in determining which checklists to audit and which spot checks to conduct 	Bill Goebel	11/01/2007	Use paper checklists until handhelds in place



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Strategy 3: Tririga supports all FM functions

Objective	Action Item	Responsible	Target Date	Notes
5. Tririga tracks all maintenance work	12. Tririga will be able to track PM tickets different from DM tickets	Andy Brush	09/01/2007	
	13. Tririga tracks all preventative maintenance categories. <ul style="list-style-type: none"> • HVAC • Plumbing • Electrical • Security/Alarms • Supervisory audits • Miscellaneous (e.g., elevator inspection, automatic door inspection) 	Andy Brush	08/10/2007	Use PM Matrix as baseline
	14. Add snow removal to Tririga	Supervisors	11/01/2007	
	15. Tririga allows streamlined entering of tickets	Andy Brush	09/01/2008	
	16. Tririga allows entering of measurements taken on equipment	Andy Brush	09/01/2008	
6. All FM staff use Tririga for PM	17. Provide Tririga training to current and new staff <ul style="list-style-type: none"> • Staff trained in using Tririga • Manager trained on creating reports, tracking, and trending • Tririga PM Frequently Asked Questions (FAQ) in place • PM manual for skilled trades and techs in place 	Dave Shirley	10/01/2007	
7. Tririga provides necessary performance data	18. Develop Tririga KPI tracking system for supervisor roll-out <ul style="list-style-type: none"> • Add "completion times" (how long it takes to do the work) 	Andy Brush		On 9/1, start tracking what is possible. Integrate new indicators as soon as possible.



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Objective	Action Item	Responsible	Target Date	Notes
	19. Develop Tririga KPI tracking system for staff roll-out <ul style="list-style-type: none"> • Percent DM tickets completed on time (Target: 100%) • Percent PM tickets completed on time (Target: 100%) • Percent hours used for DM per code (No target - somewhere around 60 to 50%) • Percent hours used for PM (No target - somewhere around 50 to 40%) • Cost of ownership per square foot per building (Target: reduce) • Equipment life time as percent of scheduled per 20-year replacement plan • Savings due to increased equipment life and reduced breakages • Percent of rework 	Andy Brush	10/01/2007	
	20. Maintain KPI tracking system in Tririga	Andy Brush	09/01/2007	Ongoing after target date
8. Tririga handheld solution in place	21. Decide whether and when to employ Tririga handheld solution <ul style="list-style-type: none"> • Handhelds will include PM checklists • PM ticket will include a box for checking off that PM checklist was completed (field audits) 	Dave Shirley	12/31/2007	



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Strategy 4: Continuously improve maintenance processes

Objective	Action Item	Responsible	Target Date	Notes
9. Data drives decision-making and scheduling	22. Use monthly reports of key performance indicators to adjust DM and PM workload and staff assignments	FM Lead	11/01/2007	Ongoing after target date
	23. Track any process changes through Tririga-supported data	FM Lead	Ongoing	
	24. Create up-to-date PM time estimates for each piece of equipment <ul style="list-style-type: none"> • First PM cycle: Track average actual time for each PM task across staff • Second PM cycle: Average actual becomes estimate and will be added to ticket • Ongoing: Update estimates as needed 	Dave Shirley	01/01/2009	
10. PM checklists are up-to-date for each piece of equipment	25. Create initial set of PM checklists for skilled trades and maintenance techs <ul style="list-style-type: none"> • Skilled trades review manufacturer checklists to replace generic checklists • Skilled trades take both their and the generic PM checklists to conduct initial PM per PM schedule • During initial PM, skilled trades revise both checklists to match equipment make, model, and year and check off which PM steps should be done by maintenance techs and by skilled trades • Checklists include space to write down equipment condition, such as pressure, temperature, etc. This information will be used to determine whether PM work was done and track conditions for each equipment over time • Skilled trades supervisor reviews checklists and forwards them to CAD/CAFM person • CAD/CAFM person enters updated checklists into system 	Bill Goebel	10/01/2007	Dave – confirm if this is still part of the plan: Techs go with skilled trades to do first cycle PM tasks (supervisors will coordinate)



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Objective	Action Item	Responsible	Target Date	Notes
	26. Continuously update PM checklists <ul style="list-style-type: none"> • Prior to conducting PM, staff print latest checklists (copies of old checklists may be out-of-date) • If needed, staff write down things that were done differently, added, or not done • Staff forward revised checklists to their supervisors • Supervisors review checklists and forward them to CAD/CAFM person • CAD/CAFM person enters updated checklists into system • CAD/CAFM person enters equipment conditions (pressure, temperature) as recorded on checklist into system to track equipment condition over time 	Supervisors	Ongoing after first PM cycle	Use paper process until handheld solution in place
11. Establish expectations	27. Clearly communicate staff expectations regarding continuous improvement of maintenance operations <ul style="list-style-type: none"> • If staff identify that something is about to fail while they do break/fix or PM work, write a separate PM ticket that can be tracked separately (e.g., demand ticket with a different priority level) • PM checklists should include the following step: If equipment is getting close to replacement date, determine whether equipment can last beyond expected life cycle or whether it should be replaced • Do things right, such as write down when filters were changed • All work will be ticketed • 100% of tickets will be entered in Tririga 	Supervisors	09/06/2007	Ongoing after target date
12. Develop an enhanced PM work plan	28. Identify additional PM tasks that can be implemented at later cycles <ul style="list-style-type: none"> • Include additional PM tasks in PM Matrix & Schedule, such as inspections for parking lots, sidewalks, roofs, and drains • Adjust PM frequencies for each equipment based on location, installation type, manufacturers' recommendations, trade norms, and per actual findings (e.g., filters or belts may be replaced on a larger interval) 	FM Lead	09/01/2008	Ongoing after target date with emphasis on Year 1



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Objective	Action Item	Responsible	Target Date	Notes
	29. Create an on-demand replacement schedule in Tririga	Andy Brush	09/01/2008	
	30. Create an on-demand equipment repair history	Andy Brush	09/01/2008	
	31. Tririga tracks required performance indicators <ul style="list-style-type: none"> • Add: Unscheduled outages • Add: Unscheduled downtimes 	Andy Brush	09/01/2008	
13. Initiate comprehensive PM	32. Institute fixed schedule for completely replacing items by building <ul style="list-style-type: none"> • Reduce demand maintenance hours and breakages • Increases time available for preventative maintenance 	Dave Shirley	Q1/2009	Example: replace light bulbs in an entire building, rather than on a demand-bases



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Example of Performance Tracking

Examples of how key performance indicators can be tracked over time.

Preventative Maintenance Task Completion	2007		2008				2009			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
100% - Target										
90										
80										
70										
60										
50										
40										
30										
20										
10										
0										

Maintenance Time Distribution	2007		2008				2009			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
100%										
90 – Current DM hours	88									
80										
70										
60 – Target range for DM hours										
50										
40 – Target range for PM hours										
30										
20										
10 – Current PM hours	12									
0										



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Characteristics of Key Performance Indicators

For KPI metrics to be effective they must:

- Clearly defined, actionable, and measurable goals that cascade from organizational mission to management and program levels to individual performance;
- Cascading key performance indicators that can be used to measure how well mission, management, program, and individual goals are being met;
- Established baselines from which progress toward attainment of goals can be measured;
- Accurate, repeatable, and verifiable data; and
- Feedback systems to support continuous improvement of an organization's processes, practices, and results (outcomes).
- Be easy to produce regularly and consistently.

From: "Analysis and Recommendations, Requirements Analysis Audit." Business Resources Group, October 2006, p. 35.



Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Continuous Improvement Cycle

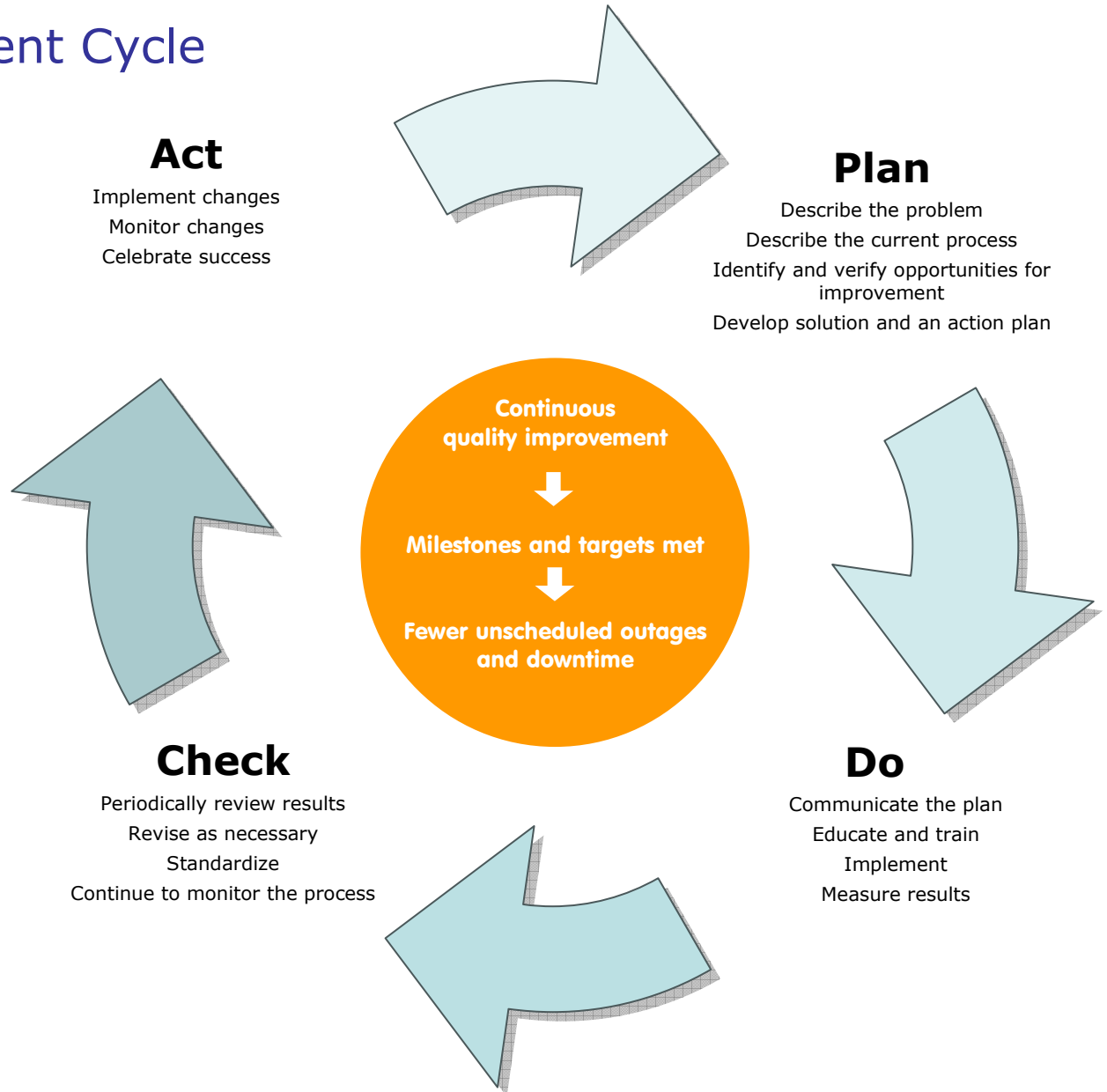
Example applications of the Continuous Improvement Cycle for maintenance work

PM Checklists

- Plan Use [generic] PM checklist
- Do Complete and revise checklist in field
- Check Review and update electronic checklist
- Act Use updated checklist for next PM cycle

PM Scheduling

- Plan Use previous average hours per task as estimate – if available
- Do Complete task and track hours
- Check Review hours and enter into Tririga
- Act use updated actual hours as estimate for next PM cycle





Preventative Maintenance Work Plan

Support Services – Facilities Management Division

Planning Facilitation



Contact: Peter Dams, Ph.D.

Phone: (269) 501-3000

Fax: (866) 472.0554 toll-free

Email: pdams@damsandassociates.com

Web Site: www.damsandassociates.com

Address: 8449 35th Street South, Scotts, Michigan 49088