



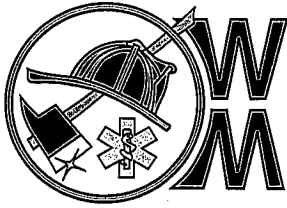
REGULAR MEETING OF THE
WEST METRO FIRE PROTECTION DISTRICT
BOARD OF DIRECTORS



Wednesday, November 8, 2006

7:00 p.m. ~ WMFR Board of Directors

WMFR Administration Building
433 S. Allison Parkway
1st Floor ~ Board Room
Lakewood, CO 80226



West Metro Fire Protection District

433 S. Allison Parkway
Lakewood, CO 80226

Bus: (303) 989-4307
Fax: (303) 989-6725
www.westmetrofire.org

Please Post

NOTICE OF

A REGULAR MEETING OF THE BOARD OF DIRECTORS OF THE
WEST METRO FIRE PROTECTION DISTRICT

PUBLIC NOTICE is hereby given that a Regular Meeting of the Board of Directors of the West Metro Fire Protection District shall be held at 7:00 p.m. on Wednesday, November 8, 2006 in the Board Room at 433 S. Allison Parkway, Lakewood, CO. Items on the Agenda of the meeting include, but are not limited to a review of meeting minutes, to hear reports regarding bond projects, activity reports, to approve the purchase of TriTech Mobile CAD/AVL software products and other matters that may come before the Board.

IN WITNESS WHEREOF: This NOTICE is given pursuant to statute this 2nd day of November, 2006.

WEST METRO FIRE PROTECTION DISTRICT

By: /s/ Leo J. Johnson
President

/bjb

A G E N D A

West Metro Fire Protection District

~ WMFR Board of Directors' ~

Regular Meeting | Wednesday, November 8, 2006

Location: 433 S. Allison Parkway, Board Room, Lakewood, CO 80226

~ **PLEASE PLACE ALL CELL PHONES AND PAGERS ON SILENT ALERT** ~

I. CALL TO ORDER

7:00 p.m.

II. ROLL CALL

III. PLEDGE OF ALLEGIANCE

Moment of Silence in Honor of Fallen Firefighters

Firefighter Pablo Cerda, USDA Forest Service, San Bernardino National Forest,
San Bernardino, California

Firefighter Allan Roberts, Baltimore City Fire Dept., Baltimore, Maryland

Firefighter Daniel Hoover-Najera, USDA Forest Service, San Bernardino National
Forest, San Bernardino, California

Assistant Fire Engine Operator Jason McKay, USDA Forest Service, San Bernardino
National Forest, San Bernardino, California

Fire Engine Operator Jess McLean, USDA Forest Service, San Bernardino National
Forest, San Bernardino, California

Captain Mark Loutzenhiser, USDA Forest Service, San Bernardino National Forest, San
Bernardino, California

Deputy Chief/Chaplain, Dr. Raleigh England, Beaver Fire Department, Beaver, WV

IV. PUBLIC COMMENT

V. REVIEW OF THE MINUTES:

A. October 17, 2006, Page 4

VI. REPORTS:

A. Report of Chief:

1. Updates and Reports:

i. Chief McBee:

a. Purchasing Card Program, RE: Purchasing Policy

b. Accreditation Update

ii. Deputy Chief Lombardi, Administration:

a. Bond Projects

iii. Deputy Chief Armstrong, Operations:

a. 48/96 Report, Page 14

b. Recent Activities

iv. Deputy Chief Abbink, Life Safety:

a. St. Anthony's Hospital Task Force Report

b. RTD Fast Tracks Update

v. C. Matthews, COD:

a. Community Room Report

b. Focus Group Report

2. Other Matters
 - B. **Report of Legal Counsel** ~ R. Lyons, Esq.
 - C. **Report of the Vice Chairman** ~ Director D. Wiechman
 - D. **Treasurer's Report** ~ Director P. Koller
 - E. **Report of the Union** ~ Lt. Frainier
 - F. **Report of Committees**
 1. Civil Service Committee
 - i. Next Meeting, November 9, 2006
 2. Health Trust Committee ~ Director McConnell
 - ii. Next Meeting, November 15, 2006

VII. OLD BUSINESS

VIII. NEW BUSINESS

- A. Approval | TriTech Mobile CAD/AVL Software Products and Services, Division Chief M. Krapf, Page 9
- B. Approval | St. Anthony Hospital System's Request to Use the Name of West Metro Fire Rescue, Deputy Chief G. Armstrong, Page 11

X. OTHER MATTERS

XI. EXECUTIVE SESSION

XII. ADJOURNMENT

XIII. ANNOUNCEMENTS

Nov. 9, 2006	7:00 p.m., Civil Service Committee Mtg, BOD Room, 433 S. Allison Pkwy., Lakewood, CO
Nov. 10, 2006	Observance of Veteran's Day, <i>Administrative Offices Closed</i>
Nov. 15, 2006	8:30 a.m., Employees Health Trust BOT, BOD Room, 433 S. Allison Pkwy., Lakewood, CO
Nov. 21, 2006	7:00 p.m., Regular Session, BOD Mtg, BOD Room, 433 S. Allison Parkway, Lakewood, CO
Nov. 23 - 24, 2006	Thanksgiving Holidays, <i>Administrative Offices Closed</i>
Dec. 5, 2006	7:00 p.m., Regular Session, BOD Mtg, BOD Room, 433 S. Allison Parkway, Lakewood, CO
Dec. 6, 2006	8:30 a.m., Employees Health Trust BOT, BOD Room, 433 S. Allison Pkwy., Lakewood, CO
Dec. 12, 2006	6:30 p.m. – 9:30 p.m., BOD/CSC Holiday Celebration, "The Den" at Foxhollow Golf Course, 13410 Morrison Rd., Lakewood, CO 80228
Dec. 19, 2006	7:00 p.m., Regular Session, BOD Mtg, BOD Room, 433 S. Allison Parkway, Lakewood, CO

West Metro Fire Rescue Board of Directors

MINUTES

OCTOBER 17,
2006

8:15 P.M.

BOD ROOM
433 S. ALLISON PKWY.
LAKEWOOD, CO 80226

MEETING CALLED BY	Board of Directors
TYPE OF MEETING	Regular Meeting Open Public Format
FACILITATOR	Chairman Leo J. Johnson
RECORDING SECRETARY	B. Brandt
ATTENDEES	<p><u>BOD PRESENT:</u> LJohnson, DWiechman, JKullhem, PKoller, RMcConnell, MMessenbaugh</p> <p><u>BOD EXCUSED:</u> MChavez</p> <p><u>STAFF PRESENT:</u> Fire Chief McBee, Deputy Chief DLombardi, Deputy Chief GArmstrong, Division Chief DAbbink, SRush, CMatthews, SMyers, BBrandt</p> <p><u>OTHERS PRESENT:</u> D. Bernard, Esq.</p>

Roll Call: As listed above.

Pledge of Allegiance: Those present recited aloud the Pledge of Allegiance, and then remained standing for a moment of silence in honor of all fallen firefighters.

8:17 P.M. **PUBLIC COMMENT** **L. JOHNSON**
BOD Chairman

DISCUSSION	Chairman Johnson announced that no one had signed up to address the BOD during this meeting.
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8:20 P.M. **REVIEW OF THE MINUTES** **BOARD OF DIRECTORS**
October 3, 2006

ACTION ITEMS	<p><i>MOTION: It was moved and seconded to approve the minutes of the BOD meeting dated October 3, 2006, as written. The motion carried. Director Messenbaugh abstained, as he was not present during the October 3, 2006 meeting.</i></p>
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8:17 P.M. **CORRESPONDENCE** **L. JOHNSON**
BOD Chairman

DISCUSSION	<p>Chairman Johnson:</p> <ul style="list-style-type: none"> Letter from Ms. Paulann Doane, Executive Director of the Red Rocks Community College Foundation, thanking Chief McBee for the District's participation during RRCC Foundation's Awareness Luncheon on September 19, 2006. Noted that a court reporter was present during the meeting of the Bancroft Fire Protection District Old Hires Pension Plan meeting at the suggestion of R. Lyons, Esq.
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8:32 P.M.

CHIEF'S REPORT

D. MCBEE

Fire Chief

	<p>Capt. D. Wahl:</p> <ul style="list-style-type: none"> • WM Foundation Update: <ul style="list-style-type: none"> ▶ Originally formed to obtain "Smoke Trailer". ▶ Funds currently available are approximately thirty three thousand dollars (\$33,000). If the Foundation is dissolved, funds may be transferred to IAFF Union Local #1309, but would remain a separate account, or could be directed to another charity. ▶ Took 5 years to obtain 501(3)(c). ▶ Could elect new BOT President and continue Foundation. ▶ Capt. D. Wahl would like to see construction of the Lakewood Mountair Fire Dept. historical fire station in the Belmar Park. <ul style="list-style-type: none"> → Director Koller asked if salvage from the two (2) fire stations being remodeled could be used to build the re-creation of the historical Fire Station. Staff noted that would not be possible. ▶ Director Johnson would like to see the Foundation continue and noted that an annual meeting should be called. <p>Ms. Shannon Rush, HR:</p> <ul style="list-style-type: none"> • Presentation, RE: FPPA Overtime Issue/Solution. <ul style="list-style-type: none"> ▶ Mr. S. Myers noted the budgetary impact the 1.5% provision would have on 3 points. ▶ Mr. Myers and Ms. Rush to return to BOD with proposed Resolution.
<p>DISCUSSION</p>	<p>Fire Chief McBee:</p> <ul style="list-style-type: none"> • Distributed invitation to Recruit Graduation on November 3, 2006. • Paramedic Graduation will be held in February of 2007. • Assistant Chief Assessment Center will be held on November 3, 2006 for thirteen (13) candidates. • Other fire departments considering or currently using a 48/96 shift schedule have requested the Fire Chief to forward WMFR's 48/96 use information. Staff will be coming to the BOD for approval. • Clarification - Shift scheduling is within the purview of the Chief and will be examined after the first of the year. • Will be unavailable from October 21, 2006 until October 30, 2006. During time, Division Chief Abbink will be Acting Fire Chief. <p>Deputy Chief Lombardi, Administration:</p> <ul style="list-style-type: none"> • Bond Projects: <ul style="list-style-type: none"> ▶ Fire Station No. 7: Design of floor plan 90% complete. Civil engineering will be addressed next. Plans to Fire Prevention soon. ▶ Fire Station No. 10 and Training Center: Continues to move forward. Will provide reasoning for "tear down and rebuild" at 3535 Kipling during a subsequent BOD meeting. <ul style="list-style-type: none"> → US&R Team utilizing space. ▶ Activities of Mr. V. Gonzales: Working on Communications Center - cost analysis should be ready October 18, 2006. <p>Deputy Chief G. Armstrong, Operations:</p> <ul style="list-style-type: none"> • Provided an overview of recent calls for assistance. • 48/96 Report: Provided an overview of the success of the 48/96 shift schedule.

	<p>Division Chief D. Abbink, Life Safety:</p> <ul style="list-style-type: none"> • Attended meetings with mechanical engineers at St. Anthony's Hospital. Will be sitting on task force for the upcoming construction project. • One property near Green Mountain High School has refused to include in WMFR. Life Safety Division will enforce the fire code by authority of the City of Lakewood. • Working with schools to continue utilizing "Fire Watch" during events. Distributed photo's to demonstrate hazards. • Morningstar Senior Housing – Built facility within one month. • Is available to meet with BOD Negotiation Committee, at their convenience, RE: A/C's Policy. <p>Ms. C. Matthews, COD:</p> <ul style="list-style-type: none"> • Bootcamp for home daycare providers was recently held and received a 98% appreciation rating from participants. • Provided an outline of other programs and projects of the Community Outreach Division. <p>Chairman L. Johnson:</p> <ul style="list-style-type: none"> • Community Room in new Fire Stations. Other facilities are available nearby. Construction of Community Rooms may not be advisable. Conflict could occur when Firefighters are in mandatory rest periods.
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9:43 P.M.

REPORT | LEGAL COUNSEL

D. BERNARD, ESQ.
Legal Counsel

DISCUSSION	<ul style="list-style-type: none"> • Update, RE: Mullin litigation. Should receive court date on Friday, October 20, 2006. • Briefly relayed his impression of BFD OH Pension meeting earlier this evening.
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9:51 P.M.

REPORT | BOD CHAIRMAN

L. J. JOHNSON
BOD Chairman

DISCUSSION	<p>Director L. Johnson:</p> <ul style="list-style-type: none"> • Next meeting of Health Trust BOT will be held on Wednesday, November 15, 2006. Director Johnson will be unavailable and will not attend that meeting.
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9:54 P.M.

REPORT | TREASURER

P. KOLLER
BOD Treasurer

DISCUSSION	<p>Director P. Koller, Treasurer:</p> <ul style="list-style-type: none"> • No report submitted during this meeting.
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9:57 P.M.

REPORT | IAFF UNION LOCAL #1309

LT. K. REICHENBACH
IAFF Union Local #1309

DISCUSSION	<p>Lieutenant K. Reichenbach:</p> <ul style="list-style-type: none"> • No report submitted during this meeting.
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DRAFT

10:00 P.M.

REPORTS | COMMITTEES

L. JOHNSON

Civil Service Committee
and Employees Health Trust

DISCUSSION	<p>Civil Service Committee:</p> <ul style="list-style-type: none"> As Director Chavez was not able to attend the October 12, 2006 meeting of the Civil Service Committee, Chairman Johnson provided a brief overview of their recent activities. Director Johnson requested that the reappointment of CSC members E. Hester, R. Igel and J. Rosenberger be added to the Agenda of the November 21, 2006 WMFR BOD meeting. <p>Employees Health Trust Board of Trustees:</p> <ul style="list-style-type: none"> Director Johnson stated that the next meeting of the Employees Health Trust Board of Trustees will be held on Wednesday, November 15, 2006. Flu shots will be available soon.
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OLD BUSINESS

DISCUSSION	No items of Old Business were presented.
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NEW BUSINESS

10:15 P.M.

SCHEDULE PUBLIC HEARING | PROPOSED 2007 BUDGET

S. MYERS

Finance Manager

DISCUSSION	<p>S. Myers, Finance Manager:</p> <ul style="list-style-type: none"> The Proposed 2007 Budget will be reviewed with the BOD's Budget Committee. The meeting schedule will be set via email.
ACTION ITEMS	
<p>MOTION: It was moved and seconded to schedule a Public Hearing regarding the Proposed 2007 Budget to be held at 7:30 p.m., on Tuesday, November 21, 2006, and to authorize publication of the Meeting Notice, as required. The motion carried.</p>	

10:20 P.M.

**SCHEDULE PUBLIC HEARING | 2006 SUPPLEMENTAL
APPROPRIATIONS**

S. MYERS

Finance Manager

DISCUSSION	<p>S. Myers, Finance Manager:</p> <ul style="list-style-type: none"> The supplemental appropriations are needed for the proceeds from both the 2006A and 2006B General Obligation Debt issuances.
ACTION ITEMS	
<p>MOTION: It was moved and seconded to schedule a Public Hearing regarding the General Obligation Bond – Construction Fund and the Debt Service Fund supplemental appropriations, to be held at 7:30 p.m., on Tuesday, November 21, 2006, and to authorize publication of the Meeting Notice, as required. The motion carried.</p>	

DRAFT

10:25 P.M.

APPROVAL | MFTC DIRECTOR EMPLOYMENT AGREEMENT**CHIEF MCBEE**

Fire Chief

DISCUSSION	Fire Chief McBee: <ul style="list-style-type: none"> Explained the manner in which the Metro Fire Training Center Director was selected and that as the MFTC consists of four (4) separate fire departments/districts, the "employer of record" is currently South Metro Fire Rescue.
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ACTION ITEMS

MOTION: *It was moved and seconded to approve and authorize the WMFR Board Chairman to execute the Metro Fire Training Center Employment Agreement with K. Duffala as MFTC Director. The motion carried.*

10:30 P.M.

OTHER MATTERS**D. LOMBARDI**

Deputy Chief of Administration

DISCUSSION	Deputy Chief D. Lombardi: <ul style="list-style-type: none"> Briefly reviewed the BOD Brief included in this meetings packet, RE: Purchase of TriTech Mobile CAD/AVL Software Products and Services.
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10:40 P.M.

EXECUTIVE SESSION**L. JOHNSON**

Board Chairman

MOTION: *At 10:40 p.m., it was moved and seconded for the Board of Directors of the West Metro Fire Protection District to enter into an Executive Session as per CRS Section 24-6-402(4)(b) and (f); regarding legal advise on a personnel matter. The motion carried.*

MOTION: *At 11: 45 p.m., it was moved and seconded to reconvene the October 17, 2006 meeting of the West Metro Fire Protection District Board of Directors. The motion carried.*

Chairman Johnson announced that during the Executive Session no votes were taken, nor were any motions made.

MOTION: *It was moved and seconded to approve the expenditure of pension funds through the Fire and Police Pension Fund for Firefighter 1st Grade Joseph Mustari and Lieutenant Gary Gardelli. The motion carried.*

ADJOURNED	11:46 P.M.
RECORDING SECRETARY:	<u>/s/ BBrandt</u>
BOD & CSC SECRETARY:	<u>/s/ MChavez (pending approval)</u>

Date	Agenda No.	Subject
11-7-06		Purchasing of TriTech Mobile CAD/AVL Software Products and Services

Initiated By: Division Chief Mark Krapf, Communications Division
Action Proposed: Approval of TriTech Software Systems Sales Order
Presented By: Deputy Chief Don Lombardi

INTRODUCTION: West Metro Fire Rescue has received funding to purchase and implement a mobile solution for the purpose of relaying CAD (Computer Aided Dispatch) information between field EMS/Fire Response Units and the Dispatch Center. West Metro Fire Rescue has secured funding for a portion of this project through the Jefferson County E911 Authority as well as through the Bond Election.

HISTORY AND FACTS:

Firefighters, Emergency Medical Personnel are hungry for more and better quality of information in the field. First responders want and need a broader range of functions similar to the functions that dispatchers can access from their consoles. Specifically, they want onscreen maps, navigation help and full details about the incident to which they are responding. For these reasons, many Police, Fire and EMS agencies are moving toward "in-vehicle" mobile CAD platforms.

As a dispatch center is receiving the E911 information, such as (ALI) Automatic Location Identification, this information can automatically be pushed out to the field response units.

Driving directions to this incident are provided automatically from this (ALI) information and displayed on the map. Onboard routing software with up-to-date mapping/GIS information helps get first responders to the incidents faster. The system will calculate the quickest path to the incident based on distance, speed limits and even current traffic flows.

As an example the system can be programmed to know when it is rush hour and will recommend alternative routing that will reduce response times. The ability of first responders to view CAD/ALI information adds a degree of redundancy and virtually eliminates the possibility of dispatcher error in airing this critical information over the radio system.

An automatic vehicle locator (AVL) is a device that makes use of (GPS) Global Positioning Systems to enable emergency response agencies to remotely track the location of their emergency response vehicles. These devices combine positioning technology with street level mapping, GIS and an intuitive user interface. Improving apparatus/personnel response and service is the goal of any AVL system.

Tying this AVL technology to CAD and using powerful software tools such as "Live Routing" or "Closest Unit" adds yet another layer of improvement to the goal of getting the correct and closest first responders to the incident scene. These combined tools allow CAD to make response recommendations from Call Type, Call Location and now by the "Closest" Response Vehicle Location.

AVL/CAD systems are used to increase the accountability of field units/personnel and boost the efficiency of dispatching emergency response resources. Dispatch personnel get a real-time snapshot of what is happening throughout their district. If these systems are tied together, command officers will know what emergency response resources are available to them throughout the region. This is a very powerful command and control tool.

This Purchasing Request/Sales Order does not include any mobile data computers (MDT) or the wireless integration solution. This equipment and services are part of a greater mobile solution to include a Fire and EMS reporting package. These future expenditures will be presented at a latter date, but are inclusive in the overall Bond Funding.

FINANCIAL DETAILS:

E911 Authority Funding Approval \$223,061

Expenditures Required	Amount Budgeted	TriTech Sales Order
\$73,908	\$280,000	\$296,969 (911 Funding Plus Expenditure Request)

LEGAL OPINION: Review of Statement of Work

CONFLICTS AND/OR COMPLICATIONS:

CONCLUSION AND RECOMMENDATIONS: Obligate funds for this project.

SUGGESTED MOTION: Move to authorize funds in the amount of \$73,908 for the purpose of Purchasing the TriTech CAD/AVL Software Products and Services Mobile Solution.

Date	Agenda No.	Subject
11-08-06		Approval for St. Anthony Hospitals to use West Metro's name and the data relating to the trial of the 48/96 Schedule.

Initiated By: Deputy Chief of Operations Gary Armstrong
Action Proposed: Approve execution of correspondence by Director Wiechman
Presented By: Deputy Chief of Operations Gary Armstrong

INTRODUCTION:

St. Anthony's has requested written confirmation of approval by the West Metro Fire Protection District Board of Directors, for their use of West Metro's name and data gathered for the 2006 study of the 48/96 Shift Schedule.

HISTORY AND FACTS:

In the fall of 2005, West Metro approached St. Anthony Hospitals regarding a trial of the 48/96 Schedule, to be conducted in 2006. St. Anthony's agreed to have Dr. Allison Hawks research the schedule and provide that information to West Metro and other agencies. Since that time, St. Anthony's has spent substantial resources in completing the research on the 48/96 Schedule trial; including a sleep study, multiple surveys, focus groups that were completed on a contractual basis, along with a significant time commitment by Dr.'s Allison Hawks and Neale Lange.

FINANCIAL DETAILS: None

Expenditures Required	Amount Budgeted	Appropriation Required
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**West Metro Fire Rescue
Request For Board Action
Page 2**

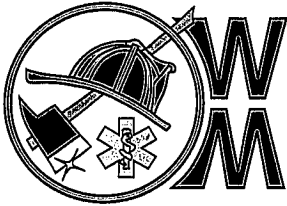
LEGAL OPINION: None Requested.

CONFLICTS AND/OR COMPLICATIONS: None anticipated.

CONCLUSION AND RECOMMENDATIONS: See attached letter

SUGGESTED MOTION:

I move that the West Metro Fire Protection District Board of Directors approve St. Anthony Hospitals use of the West Metro name, insignia, and data relative to the study of the 48/96 Shift Schedule.



West Metro Fire Protection District

433 S. Allison Parkway
Lakewood, CO 80226

Bus: (303) 989-4307
Fax: (303) 989-6725
www.westmetrofire.org

November 1, 2006

**Saint Anthony Hospitals
4231 West 16th Avenue
Denver, Colorado 80202**

Gentlemen:

You are hereby granted permission to use the West Metro Fire Protection District name, logo and any information obtained during our joint 2006 48/96 trial.

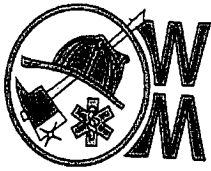
The West Metro Fire Protection District is proud to have conducted this study and appreciates the invaluable assistance of Saint Anthony Hospitals personnel.

We look forward to our continuing partnership with Saint Anthony Hospitals in providing exceptional care to the citizens we both serve.

Sincerely,

**David Wiechman
Board Vice-President**

GA/bb



Fire Chief Doug McBee West Metro Fire Rescue

Memo:

To: The Board of Directors
From: Chief Doug McBee *Dme*
Date: November 2, 2006
Re: 48/96 Schedule

The nine month trial period for evaluating the 48/96 Schedule has been completed. The criteria that was measured by the Administrative Staff covered injuries, vehicle accidents, exposures, citizen complaints, damage reports, response times, corrective action and sick leave. That data has been included in the 48/96 Schedule Report as part of the Executive Summary.

The Board of Directors, the District's Administration and IAFF Local Union #1309 agreed to a trial of this schedule change from the Berkeley Schedule. Nine months of evaluation and the research that was conducted by St. Anthony Central Hospital and the Fire Focus Groups have shown no serious, negative impacts to the majority of our employees, citizens and Administrative Staff of West Metro Fire Rescue.

We undertook this trial and evaluation of schedule change at the request of IAFF Local Union #1309. The Administrative Staff, of West Metro Fire Rescue, created the reports and collaborated with St. Anthony Central Hospital to provide accurate documentation as to how a change in schedule would impact the overall operation of our agency.

First and foremost, this change in schedule is a benefit to our line Fire Fighters. It has produced some ancillary benefits to the District such as reduced sick leave, improved Fire Fighter morale and minimized travel expenditures for both our Fire Fighters and our apparatus on a non-emergent basis. However, it has created some communication challenges for management of which will be monitored and evaluated over time.

It would be my recommendation to the Board of Directors, based upon the studies conducted during this trial period, that we continue with the 48/96 Schedule with the understanding that it is management's right to establish the work schedule for all of our District's employees. I would further recommend that the Fire Chief, or his designee, report to the Board of Directors annually concerning this schedule.

At the end of three years, a truer picture of the outcome of this schedule should be better understood. At this time, I see no compelling reason not to continue with the 48/96 Schedule for 2007.

West Metro Fire Protection District
9 Month Trial Study of the 48/96 Schedule
11-1-2006

Background:

The West Metro Fire Protection District is located in the West and Southwest suburbs of the Denver metropolitan area. With 15 Fire Stations and more than 310 uniformed personnel, West Metro provides fire and emergency medical services to an excess of 240,000 people over a 100-square mile area. In 2005, West Metro responded to 22,151 calls. West Metro maintains seven on duty ambulances and all apparatus are Advanced Cardiac Life Support (ACLS) as approximately 70% of responses are emergency medical calls. Engine 1 is West Metro's busiest engine running about 3,485 calls per year. Engine 15 has the lowest call volume with approximately 311 calls each year. West Metro is heavily involved in a variety of special operations including: Dive and Swift Water and Ice Rescue, Wildfire Operations, Technical Rescue (including the Sponsorship of the Colorado Urban Search and Rescue Task Force 1), Hazardous Materials, Fire Investigations, Tactical Emergency Medical Services, and Special Events Medical Care.

Prior to 2006, West Metro line personnel worked a "Berkley" Schedule (day on, day off, day on, day off, day on and then four days off). In February of 2005 the Union Membership began formal discussions specific to the 48/96 work schedule. A committee was established to research the new schedule of 48 hours on duty followed by 96 hours off. The committee recommended a one year trial. The union membership then voted to conduct a trial of the new schedule with approval of 64% of the members voting. The Union Officials and the Administration requested the trial to the West Metro Board of Directors who denied the proposal by a 4-3 vote. The Union then brought the request to the 2006 contract negotiations and was successful in getting the trial implemented. Prior to the Trial, the Physician Advisor for West Metro, Dr. Peter Vellman of St. Anthony's Hospitals was contacted. Dr. Vellman recommended Dr. Allison Hawks conduct a study of the new schedule beyond what West Metro was able to track. Dr. Hawks completed her own research and gathered information from Dr. Neale Lange specific to sleep research. Please see the "Evaluation of the 48/96 Shift for West Metro Fire" by Dr. Allison Hawks and the "West Metro Fire Focus Group Report". In September of 2006 the Union voted to retain the schedule with an 86 percent approval.

The Data:

The District tracked injuries, vehicle accidents, exposures, complaints, damage reports, response times, corrective actions, and sick leave. Physical fitness scores and citizen feedback were both examined and showed no significant change between the two schedules. All data is relative to a 9 month period. Some historical data is provided as a percentage of the year and not broken down by month.

Injuries

Injuries were broken down into work comp. (directly related to work) and non work comp. (not directly related to work).

	2004	2005	2006
Work Comp. Injury	35	19	20
Non-Comp Injury	22	11	14

2006	1 st Shift	2 nd Shift	No Shift
Work Comp. Injury	8	7	5
Non-Comp. Injury	7	6	1

2006 showed an increase in the number of injuries relative to that of 2005 but a significant decrease relative to 2004. It should be noted that 2005 was an exceptional year for West Metro specific to low numbers of injuries and vehicle accidents. No significant relationship between the 1st and 2nd shift of the 48 hours was noted. No injury was found to be directly or indirectly related to fatigue. It is important to note that West Metro has seen dramatic improvement in injury prevention and injury recovery through the programs designed and implemented by the Safety Division and Wellness / Workers Compensation Manager. This has also resulted in insurance premium savings of over 1.1 Million Dollars over the last three years.

Vehicle Accidents

Vehicle accidents are specific to accidents involving West Metro vehicles and broken down into avoidable and un-avoidable. The Safety Captain at West Metro looks at each accident and makes an objective determination based on the investigation of each incident.

	2004	2005	2006
Total Accidents	25	17	19
Avoidable	21	13	12
Unavoidable	4	4	7

2006	1 st Shift	2 nd Shift	Administrative
Avoidable	3	8	1
Unavoidable	3	3	1

Avoidable vehicle accidents in 2006 were actually less than that of 2005 and 2004, however; the second shift of the 48 hours shows a significant increase relative to the first shift. It should be noted that all of the accidents in 2006 were minor in nature, non resulted in injury, nor were any found to be directly or indirectly related to sleep deprivation.

Exposures

Exposures include both medical exposures to communicable diseases as well as other exposures that can cause long term health issues such as asbestos or PCBs.

	2004	2005	2006
Exposures	14	11	12

2006	1 st Shift	2 nd Shift	Administrative
Exposures	5	5	2

Citizen Complaints

Citizen Complaints were divided as EMS related and all others. Historical data on complaints was limited at best until 2006 at which time they were aggressively tracked. The vast majority of citizen complaints were unfounded after being investigated.

	2005	2006
Complaints	31	42

2006	1 st Shift	2 nd Shift
EMS Related Complaints	16	26
Non-EMS Related Comp.	4	2

West Metro uses an internet based survey in order to get citizen feedback which is advertised through the billing for ambulance transports. In the first 9 months of 2005 there were 70 responses and in the same time frame of 2006 there were 93 responses. Over 90 percent of all the surveys were overwhelmingly positive and no significant differences were noticed between the two years.

Damage Reports

Damage Reports are broken down into EMS and Non-EMS Related. Prior to 2006 the majority of damaged EMS equipment was not tracked.

	2005	2006
Total Damage Reports	11	28
Non-EMS Damage Reports	6	8

2006	1 st Shift	2 nd Shift	Administrative
Total Damage Rep.	10	14	4

The damage to EMS equipment relative to 2005 and 2006 is not a fair comparison as the records for 2005 are not accurate. The damage to Non-EMS equipment is a more reasonable comparison and 2006 did show a slight increase compared to 2005.

Response Times

Three different areas of average response times are noted. Turnout times are the time from alert to en-route, response time is from en-route to arrival, and on-scene time is from arrival until they clear the call.

	2005	2006
Ave. Turn-out Time	:57	:54
Ave. Response Time	3:56	4:05
Average On-scene Time	23:44	23:54

The turn-out times show improvement from 2005 to 2006, however; it should be noted that one of the organizations annual objectives specifically addressed the improvement of turn-out times. Response times were slightly slower which could be attributed to less aggressive driving. Initial concerns of personnel trying to clear scenes early due to fatigue proved not to be an issue according to the average on-scene times which went up slightly.

Corrective Actions

Corrective Actions include disciplinary reports specific to the performance or lack of performance by any employee. These only include formal disciplinary action.

	2005	2006
Corrective Actions	12	11

2006	1 st Shift	2 nd Shift	No Shift
Corrective Act.	2	3	6

The majority of corrective actions could not be identified to a Shift, these include actions off duty or long term performance issues. 2006 saw a slight decrease in disciplinary reports which was likely insignificant.

Sick Leave

In mid 2005 West Metro changed its procedure to allow employees to use sick leave for the care of sick family members. Had the schedule not changed, it was expected that sick leave use would have increased. In 2006 the procedure was changed to require that any employee using over 100 hours of sick leave in one year is now required to contact their

Officer and District Chief anytime the leave is used. This procedure may have been a contributing factor to the decreased the use of sick leave but the possibility is unlikely.

	2004	2005	2006
Hours of Sick Leave	13,277	11,637	8,246

2006 saw a decrease in sick leave use by 29% when compared to the use in 2005 and a 38% decrease when compared to 2004. This improvement was directly related to a significant savings in overtime for the year.

Management:

All Chief Officers and Captains were required to provide written documentation specific to how the new schedule affects their responsibilities. With few exceptions the officers noted challenges in communications. Administrative Personnel found it very difficult to contact Line Personnel when their shifts fell on a Saturday/Sunday. The problem was even worse if the previous week included a holiday on that Monday putting their shift on a Sunday/Monday and then a Saturday/Sunday rotation. Scheduling Training and other activities became more of a challenge as well. Many Administrative personnel find themselves calling Line personnel at home during the week and also working more on weekends in order to complete timely communications. Most personnel have adjusted to this requirement and no significant issues have been noted.

Line Personnel change shifts $\frac{1}{2}$ as often and they always relieve the same shift. Captains have started using other means of communicating with the opposing Lieutenants as they meet less frequently. Pass-Down Books, E-mail, and memo's are much more prevalent. The majority of Captains like the new schedule and all have found ways to communicate effectively.

West Metro has 12 Chief Officers not including the Fire Chief. Of these Chiefs, 6 are assigned to the Line and 6 are assigned to the Administration. An informal poll showed that 6 approved of the new schedule and 6 did not. Of the 6 that approved of the schedule, 4 were assigned to the Line. The Chief Officers all recognized the challenges in communication and shared a concern of personnel becoming fatigued during the 48 hour shift. The fatigue is presently managed by rotating personnel from busier units to slower units when their 1st Shift is overwhelming. In the first 9 months of 2006 this was reported on only 3 occasions. Fatigue was considered significant when a member did not receive 5 hours of inactivity during the last 12 hours of the first shift. Officers are required to evaluate their crew members and identify those who might be fatigued and in turn notify the appropriate District Chief of the situation.

Membership:

The increase in the percentage of personnel wanting to change to the 48/96 schedule is impressive going from 64% before the trial to 86% after the trial. Many personnel were concerned about the effects on families and especially those families including children

with special needs. It appears that those concerns were relieved during the trial period. Please see the report: "Evaluation of the 48/96 Shift for West Metro Fire" by Dr. Allison Hawks and the "West Metro Fire Focus Group Report". It should also be noted that some divorced employees had to take legal action in order to adjust their child visitation rights and felt significant hardship from having to do so.

Conclusion:

West Metro can only provide limited data in a 9 month period in regards to the schedule change to 48/96. The work of Dr. Allison Hawks and Dr. Neale Lange should be considered by any agency researching this schedule change. Recognition of management rights and a good working relationship between labor and management are important in addressing concerns should this schedule change be considered.

Significant challenges to management including communications can be anticipated and reasonably overcome. Some personnel will face hardships if they are dependent on their current schedule for activities such as child visitation or part time employment outside the fire service. Limited benefits to the fire department and citizens can be reasonably expected in the form of a decrease use in sick leave and a slight decrease in long term employee fatigue. The real benefit to the 48/96 schedule is to the majority of employees through less travel to and from work and more continuous days off. It can be argued that a benefit to the employee is also a benefit to the organization. At this time the administration recommends that the West Metro Line Personnel remain on the 48/96 Schedule.

St. Anthony Hospitals



EVALUATION OF THE 48-96 SHIFT *FOR WEST METRO FIRE RESCUE*

Prepared By:

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October 2006

Executive Summary

The following study was undertaken to assist West Metro Fire Rescue with evaluating its shift change to 48-96 (48 hours on, 96 hours off), which was instituted January 1, 2006. The purpose of the information gathered was two-fold: 1) to assist West Metro Fire Rescue with the decision whether to continue the shift; and 2) to conduct research and provide information to the general EMS community on the effects of the 48-96.

Surveys, sleep diaries, and focus groups were used in the assessment.

Key findings pertaining to on-line personnel are as follows:

- The members slept more on average post change.
- The increased sleep was distributed throughout both ON and OFF shifts.
- Members slept fewer hours the night before a shift began in anticipation of getting up to go on shift and the new rotation minimizes this.
- At baseline, the majority of respondents were satisfied with their job, and this did not change appreciably with the 48-96; instead views regarding job satisfaction (and in some cases dissatisfaction) became stronger.
- On average, the respondents reported a low degree of dissatisfaction with patient care; this dissatisfaction did not increase on the 48-96, and in fact, showed a trend toward being less.
- Members felt that when compared to the old shift, the 48-96 shift interfered significantly less with leisure activities, household activities, and non-household activities like going to the bank.
- Over half (52%) of the members thought that the overall advantages of the old schedule outweighed its disadvantages, however, a significantly greater proportion of members (68%) felt that the overall advantages of the 48-96 outweighed its disadvantages.
- Use of caffeinated beverages and alcohol remained the same after the change.
- The majority of families liked the 48-96. They noted that the shift made it much easier to do special projects around the home, participate in leisure time activities, take personal time for themselves, and spend time together as a family.

- The majority of families felt that the 48-96 shift did not adversely affect their time together as a family or as a couple, nor did it put a strain on their relationship or their children.
- Very few families reported being adversely affected by the shift change with regard to changing to less satisfactory child care arrangements, elder care arrangements or visitation rights.
- Not all the members like the 48-96 shift and it has made accomplishing household tasks and taking care of children more difficult for some families.

Background

The following study was undertaken to assist West Metro Fire Rescue with evaluating its shift change to 48-96 (48 hours on, 96 hours off), which was instituted January 1, 2006. The purpose of the information gathered was two-fold: 1) to assist West Metro Fire Rescue with the decision whether to continue the shift; and 2) to conduct research and provide information to the general EMS community on the effects of the 48-96. Only the professional aspects of the members' lives were included in the formal research and members were required to provide consent. The St. Anthony Hospitals Institutional Review Board reviewed and approved the research proposal.

Methods

The methods are briefly outlined in Table 1 below; more of the technical details can be found in Appendix A. Surveys (Appendices B and C), sleep diaries, and focus groups (separate report) were used in the assessment. All of the on-line personnel employed as of December 1, 2005 were given three opportunities between April 1 and August 31, 2006 to comment on the shift change. The baseline survey and sleep diary were mailed to 314 uniform employees in December 2005. These uniform employees were identified by West Metro Fire Rescue and included on-line personnel as well as employees in administrative positions. Subsequent surveys and diaries were only mailed to on-line personnel and any other employee in an administrative position who desired to be in the study.

Since the response to the first work-related questionnaire was less than optimal, the decision was made to allow members to respond anonymously.

Table 1. Evaluation methods

Aspect of member's life assessed	Work-related questionnaire administered to on-line personnel (Dec '05, April '06, July '06).	Sleep diary for one week (Dec '05, April '06, July '06)	Family Survey (July 2006)	Focus Groups (August 2006)
Job Satisfaction	✓			
Burn-out	✓			
Number of hours of sleep		✓		
Daytime sleepiness	✓			
Ability to accomplish activities outside of work	✓		✓	
Quality of family life			✓	✓

Results

RESPONSE RATES

A detailed description of the response rates can be found in Table 2 located in Appendix D. The total response rate for the work-related questionnaires submitted anonymously plus those who consented from on-line personnel was as follows: 59.5% in December 2005, 40.9% in April 2006, and 57.9% in July 2006. A total of 79 members submitted completed questionnaires for all three time periods (29.3%)

The sleep diaries were returned at a rate of 40.5% in December 2005, 36.4% in April 2006, and 48.0% in July 2006. Approximately 25% of on-line members submitted sleep diaries for all three time periods.

The family survey had the best response with 65.1% of the families replying.

FINDINGS ABOUT SLEEP

Number of hours of sleep pre and post shift change for on-line personnel

Data were analyzed for 69 on-line members who submitted a completed sleep diary in December 2005 and July 2006¹ (see Appendix A for more of the methodological details). The average total hours slept per week during July 2006 was greater (49.7) than in December (46.1), and this difference was statistically significant (Figure 1).^{2,3} The increase in July was not due solely to members getting more sleep on their "off" times; the members also reported longer hours of sleep during the times they were "on" shift (Figure 2). On average, members reported getting 5.9 hours of sleep/night during a shift in December compared to 6.4 hours/night during July 2006 ($p < 0.01$). During off times, members reported an average of 7.1 hours/night in December and 7.4 hours in July ($p < 0.01$).

The reason for the increased number of sleep hours on shift is not clear. When the number of times awakened during the night was examined, members reported statistically significantly less awakenings during July (Figure 3). Unfortunately we did not include the reason(s) for the awakenings on the sleep diary, e.g., was the member awakened because of a call or awakened because he needed to void, nor did we ask which station the member was located in so it was not possible to correlate the number of awakenings with call volume, and this is a source of potential bias. In speaking with Gary Armstrong, Chief of Operations, the call volumes in December (2175) and July (2173) were almost identical. Figure 4 shows the average number of hours slept per night for all members who submitted a diary in July 2006. For the group, there is very little fluctuation in the number of hours slept per night during the off times with the exception of the night preceding the onset of a shift. The members reported an average of 6.9 hours of sleep compared to 7.4 to 7.6 hours on other off nights. According to Dr. Lange (the sleep medicine specialist), this pattern represents

the anticipatory effect of having to get up for the shift the next day and is an expected reaction.

Number of hours of sleep pre and post shift change for administrative personnel

Very few administrative personnel elected to take part in the study. Ten administrators submitted a sleep diary in December 2005, and the average (mean⁴) total hours slept during this time period was 44.4 hours (median⁴ 44.25). Four administrators submitted a sleep diary for July 2006, and the average (mean) total hours slept was 46.7 (median 46.25).

It is not possible to compare the average total hours slept between the on-line personnel and the administrators because so few administrators took part in the study, and because of the difference in the methods of comparison (one group was matched, the other was not).

Daytime sleepiness in on-line personnel

Excessive daytime sleepiness was assessed by the Epworth sleepiness⁵ scale that was included in the work-related questionnaires. A score greater than or equal to 10 is considered excessive daytime sleepiness from any cause. To assess this condition, we used paired data from 107 individuals who completed the questions in December and July. In this group, 43 individuals (40.2%) had excessive daytime sleepiness as measured by the Epworth sleepiness scale in December and this decreased to 39 (36.4%) in July (Figure 5). Although this difference is not statistically significant,⁶ it is in the right direction of fewer individuals reporting a score of 10 or higher.

Daytime sleepiness in administrative personnel

The proportion of administrative personnel who scored 10 or higher on the Epworth sleepiness scale in December was 50% (5/10), and this value did not change in July: the individuals who scored 10 or higher in December also scored 10 or higher in July.

GENERAL JOB SATISFACTION, SATISFACTION WORKING WITH PATIENTS, AND SATISFACTION WITH SHIFT

The work-related questionnaire asked the on-line personnel for their opinions and feelings on the following items:

- Their satisfaction with the job in general, and their observations about their co-worker's job satisfaction;^{7,8}
- The satisfaction they get from working with patients;⁹

- How much the shift they're currently working interferes with leisure time, household and non-household activities;^{7,8}
- Whether the advantages of the current shift system outweigh the disadvantages;^{7,8}
- How their spouse/partner feels about the current shift.^{7,8}

The demographics of the respondents who answered the work-related questionnaire were similar across the three time periods with the exception of the proportion of paramedic technicians in each group. In general, the consenters had a greater representation of paramedic technicians than the anonymous group. This difference in distribution of paramedic technicians was controlled for in the analysis of dissatisfaction with patient care ("burn-out") by examining the responses of paramedic technicians separately from those of non-paramedic technicians.

Table 3. Demographics of on-line members who responded to questionnaires, by time period, and by consent status

	December 2005		April 2006		July 2006	
	Consented (n=122)	Anonymous (n=29)*	Consented (n=70)*	Anonymous (n=26)*	Consented (n=113)	Anonymous (n=42)
Age, median	38.0	36.0	39	41	38.0	38.0
Gender, % male	98%	100%	97%	100%	98%	100%
Paramedic Technician (%)	45.1%	37.9%	50.0 %	20.0 %	45.1%	32.6%
Roundtrip commute, median (in minutes)	The data from this survey was not used because the question was unclear as to whether it referred to roundtrip or one-way.		50 min	40 min	45 min	45 min
Years working current shift, mean	11.6 years	11.9 years	This question was not asked on follow-up surveys because of the shift change.			

* These values do not match the values in Table 2 because surveys that were received after the cut-off date were excluded from these analyses so that the time periods would be clearly delineated. For example, December questionnaires returned in February or March 2006 were not used in the December analysis because the responses may have been influenced by the 48-96 schedule.

Overall Job Satisfaction

Overall job satisfaction was determined by a series of five statements that members were asked to respond to using a 7 point scale ranging from Disagree Strongly to Agree Strongly.

At baseline in December 2005, the majority of respondents indicated that they were satisfied with the job (Figure 6, Table 4), the kind of the work they do in this job (Figure 7, Table 4) , and did not frequently think of quitting (Figure 8, Table 4).

Members also indicated that they thought others were also satisfied with the job (Figure 9, Table 4), who did not often think of quitting (Figure 10, Table 4).

When assessed six months later in July, the results were not substantially different or statistically significant, however, there was movement towards stronger views. The proportion of people who strongly agreed or agreed with a statement increased, and the proportion who strongly disagreed or disagreed also increased, but remained less than 3%. Overall, however, the majority of individuals still said they were satisfied with their job and the work they do and were not thinking of quitting (Table 4).

Table 4. Job satisfaction, December 2005 vs. July 2006

Statement	December 2005 (n=152)		July 2006 (n=156)	
	Percent who indicated:		Percent who indicated:	
	Strong agreement or agreement with statement	Strong disagreement or disagreement with statement	Strong agreement or agreement with statement	Strong disagreement or disagreement with statement
Generally speaking, I am very satisfied with this job	86.9%	0.7%	91.0%	1.9%
I frequently think of quitting this job	2.0%	83.4%	2.6%	86.4%
I am generally satisfied with the kind of work I do in this job	88.2%	0.7%	92.4%	1.2%
Most people on this job are very satisfied with the job	78.3%	0.8%	80.7%	2.6%
People on this job often think of quitting	0.7%	78.3%	0%	81.4%

Satisfaction of working with patients

Similar to assessing job satisfaction, satisfaction of working with patients was assessed by presenting members with a series of questions that they were asked to react to on

a 5 point scale. Since patient contact differs between paramedic technicians and non paramedic technicians, the responses were calculated separately for these two groups.

In general, the trend showed that for both groups the difficulty of working with patients (Figure 11), the amount of energy required to work with patients (Figure 12), and just being tired of working with patients (Figures 13 – 15) decreased over time indicating a tendency towards less burn-out, however, none of the changes were statistically significant.¹⁰ The Copenhagen Burnout Inventory⁹ defines client burnout as “a state of prolonged physical and psychological exhaustion, which is perceived as related to the person’s work with clients;” in this case, the clients are patients. The average score measuring dissatisfaction with caring for patients also decreased from December to July (Figure 16), thus supporting a tendency to less “burn-out”. The one score that did not change for paramedic technicians was the degree of frustration of working with patients (Figure 17).

Overall satisfaction with shift

Members were asked how much the current shift system they were experiencing at the time interfered with leisure, household (going to grocery, etc.) and non-household activities (going to physician, bank, etc.). On a scale of 1 (not at all) to 5 (very much), members reported an average score of 2.3 for leisure time and household activities and 1.9 for non-household activities at baseline in December. All of these scores showed a statistically significant decrease⁹ from December to July thus indicating less interference of these activities by the 48-96 shift system (Figure 18).

Figure 19 shows the results for members’ feelings about whether the advantages of the shift system they were experiencing at the time outweighed the disadvantages. In December, 52% of the respondents indicated that the advantages of the old shift system definitely outweighed the disadvantages. In April and then in July, at least 68% of the respondents said the advantages of the 48-96 definitely outweighed the disadvantages. The proportion of respondents who said that the advantages of the old shift system definitely outweighed its advantages was small (0.7%), but this proportion increased to 5.8% when considering the advantages and disadvantages of the 48-96. This pattern of change was statistically significant with $p=0.01$.

Spouse/partner support

Members were asked how their spouse/partner felt about them working the current shift they were experiencing. In contrast to the results suggested by the family survey (presented in next section), the members reported decreased spousal support with the 48-96.

In December, 88.9% of the respondents indicated that their spouse/partner was extremely or fairly supportive of the shift they working; in July, this proportion was 83.1% (Figure 21). In contrast, the proportion of respondents citing that their spouse was fairly or extremely unsupportive increased from 3.7% to 11.9%. The pattern of change over time approached statistical significance with $p=0.06$.

USE OF CAFFEINATED BEVERAGES, CIGARETTES, ALCOHOL

Consumption of caffeinated beverages by respondents did not increase during the time under study (Table 5). Median reported alcohol use did increase from 2 drinks to 3 drinks per week, but this was not statistically significant.¹⁰ It was not possible to compare cigarette smoking between time periods because so few respondents reported smoking.

The reason caffeinated beverage intake was assessed was to evaluate if members were "medicating" themselves with caffeine to decrease the effects of possible sleep deprivation on the 48-96 and this does not appear to be the case (the effect of the 48-96 schedule on sleep was not known prior to this study). Alcohol use was assessed for a similar reason. The effect(s) of the 48-96 schedule were not known, and it was unknown whether members might increase their alcohol intake to relax off shift (either to deal with increased stress, decreased sleep, etc.).

Table 5. Use of caffeinated beverages, cigarettes and alcohol, December 2005, vs. July 2006

	December 2006	July 2006
Cups of caffeinated drinks/day, median	2	2
Number of cigarettes/week, median	Very few respondents reported smoking cigarettes so this value is not statistically valid	
Number of alcoholic drinks/week, median	2	3

MEMBER COMMENTS ABOUT 48-96

Members were presented with opportunities to submit comments on the April and July work-related questionnaires. These comments can be found at the end of report, in Figures 51a and 51b. In general, the comments were positive during both time periods. The two most common comments during both time periods were more time with family, and more sleep/rest.

IMPACT ON FAMILY

Focus Groups

The focus groups were facilitated by JVA Consulting at the request of St. Anthony Central Hospital, and the findings are being submitted in a separate report. St. Anthony Central staff did not attend the focus groups.

Family Survey

Demographics of respondents

The family survey was completed by 175 families, 70% (123) of which reported having at least one child under the age of 19, the median number of children being 2. Slightly more than half of the families had young children less than eleven years of age. Approximately 25% of the families did not have any children and the other 5% had grown children.

The majority of the families that responded (86%) had two or more adults in the household; 6.9% indicated one adult.

The average (median) commuting time for West Metro members who responded to the family survey was 40 minutes.

Ability to accomplish activities at home and with children since institution of shift change

Families were asked to rate how much easier or difficult it was for them to accomplish a variety of household activities since the shift change. These activities included the following:

- Getting daily household tasks done.
- West Metro Member: Working at paid job(s)
- Spouse/Partner - Working at paid job(s)
- Shopping for necessities.
- Handling financial matters.
- Maintaining safety/security of your home.
- Taking personal time for yourselves (getting a hair cut etc.)
- Maintaining automobile
- Taking care of member's health.
- Taking care of spouse/partner's health.
- Taking care of elder's health.
- Taking care of pets.
- "Having a social life." Visiting with friends, etc.
- Doing volunteer work.
- Doing special projects around the home.
- Participating in leisure time activities.
- Spending time together as a family.
- Taking care of elder at home.
- Arranging for child care.
- Taking care of children at home.
- Taking care of child(ren)'s health.
- Ensuring children do schoolwork.
- Supervising children's behavior and activities at home.
- Having children take part in after-school activities.
- Participating in activities at your child (ren)'s school (school events, PTA, parent-teacher conferences).
- Participating in child(ren)'s extra-curricular activities like Boy Scouts or Girl Scouts.

The results are shown in Figures 21-50. For all the tasks, there were a greater number of families who indicated that it was "about the same," "somewhat easier," or "much easier" to accomplish the activity with the 48-96 shift than it had been during the previous six months. On average, there were 20 or fewer families per task that found it "somewhat more difficult" or "much more difficult" to accomplish the task with the 48-96 shift.

There were some activities that the majority of families indicated were either somewhat or much easier to accomplish with the 48-96 and these included: doing special projects around the home (Figure 34), participating in leisure time activities (Figure 35), taking personal time for themselves (Figure 36), and spending time together as a family (Figure 37).

Child care arrangements

Families were asked if they had to change who provided child care for their children with the onset of the 48-96. Five (5) families responded "Yes." Two of the five families said that the new arrangements were as satisfactory to them as the previous ones. Three families said they were not; the arrangements were less satisfactory because they resulted in less time for the child and member to be together, child care had to be added when none was needed previously or another day(s) of child care had to be added.

Elder care arrangements

Only 1 family indicated that they had to change who provided care for their parent or older adult with the onset of the 48-96, and the arrangement was as satisfactory to them as the prior arrangement had been.

Visitation rights

Thirty-seven families answered the question about amending visitation rights since the onset of the 48-96. Six of the 37 families (16.2%) said that they did have to amend their visitation rights, and all but one of these families said that the arrangements were as satisfactory, or in the case of one family, better than the ones they had previously. The arrangement that was not as satisfactory resulted in the member being able to spend less time with the child.

Combining work and family

The final aspect of family life that members and their families were asked to comment on was whether the 48-96 schedule affected their time together as a family. Families were presented with the following five statements and asked to indicate whether the statement was "Completely Untrue," "Mostly Untrue," "Equally True and Untrue," "Mostly True," or "Completely True":

- The 48/96 schedule creates a strain for our (my) children;
- Because of the 48/96 schedule, our (my) family time is less enjoyable;
- The 48/96 schedule leaves us (me) with too little time to be the kind of parent we (I) want to be;
- The 48/96 schedule leaves us (me) with too little energy to be the kind of parent we (I) want to be;
- The 48/96 schedule creates a strain on our marital (partner) relationship.

The most common response to all of these statements was, "Completely Untrue," (Figures 46-50).

FAMILY COMMENTS

The majority of the comments submitted on the family survey were positive in regard to how the 48-96 shift has affected members' families. See Figures 52a and 52b.

Discussion including Limitations

Although the response to the work-related surveys was not as high as hoped, the results from these surveys, sleep diaries, the family survey, and the comments are relatively consistent, thus contributing to the overall validity of the findings. There are two major statistically significant findings that emerged from the evaluation: 1) The on-line members slept more on average post change; 2) the majority of on-line members who responded reported significantly less interference of the 48-96 schedule with their personal lives and were able to spend more time with their families/friends, etc. In addition, the findings do not suggest that the 48-96 schedule lead to increased job dissatisfaction or "burn-out" from working with patients. It was not possible to evaluate how the 48-96 schedule affected administrative personnel because of the low participation rate and the difficulty of interpreting their answers on the questionnaires because most of the respondents did not change shifts.

It is important to note that there may have been other changes at West Metro Fire Rescue that could account for the results, e.g., the bond issue. However, study data were collected in April before the bond issue was resolved, and differences (from December) were noted at that time, and these differences persisted into July.

One of the concerns voiced by some members was that some on-line personnel might try to skew or exaggerate the results to meet their personal agendas. It is unlikely that the observed findings are due to a group of members exaggerating their answers to make the results appear stronger or larger than they actually are. When the distribution of change was analyzed, the vast majority of respondents (90%), only changed their answers one or two categories, which would be expected. For example, if someone selected a "2" in December regarding how much

the then current shift system interfered with their leisure time, they were more likely to select a "1," "2," or "3" on repeat surveys, not a 5. In addition, two survey questions were included to assess how honestly respondents were approaching the questions. These questions included "How often do you feel tired on shift?", and "How often do you feel tired off shift?" Realistically, everyone feels tired sometimes, and very few individuals chose the extreme answers of "almost never" or "almost always." Finally, the statistical methods used (nonparametric tests) depend less on extreme answers and make it more difficult to find statistically significant differences so that if a statistically significant difference is found (like in this study), one can be fairly certain that it is a true difference and not just due to chance.

There are limitations to the study. As mentioned above, the study did not specifically assess the effects of the 48-96 on the administrative personnel, nor was the effect on crew interaction specifically examined, and several members made comments about this. Presumably, however, members took this aspect into account when they answered the question about the relative advantages vs. disadvantages of the 48-96, and when they voted. It is also possible that the effects of the 48-96 may change over time as may people's opinions. We did not formally collect information in September, but the members voted to retain the 48-96, thus adding to the total experience (9 months).

Another limitation is that the results regarding the number of awakenings on the sleep data may be biased because we did not ascertain the source of the awakening (i.e., was it call related) and therefore we can not control for the number of awakenings in comparing data from two time periods.

Approximately 40% of the on-line membership did not respond to a questionnaire, and 50% to 60% did not turn in a sleep diary. With this kind of a response, one always wonders if the experience of the non-responders is similar to the responders, however, given the membership's 86% vote to retain the schedule, this is less of a concern with this group.

Finally, the purpose of this study was to evaluate the effect of the 48-96 on a population of firefighter/paramedics, and the results are presented for the group as a whole. It is clear that for some members the schedule change was difficult both personally and professionally, and the results as presented are not intended to minimize or dismiss these difficulties.

CONCLUSIONS

- The members slept more on average post change.
- The increased sleep was distributed throughout both ON and OFF shifts.
- Members slept fewer hours the night before a shift began in anticipation of getting up to go on shift and the new rotation minimizes this.
- At baseline, the majority of respondents were satisfied with their job, and this did not change appreciably with the 48-96; instead views regarding job satisfaction (and in some cases dissatisfaction) became stronger.
- On average, the respondents reported a low degree of dissatisfaction with patient care; this dissatisfaction did not increase on the 48-96, and in fact, showed a trend toward being less.
- Members felt that when compared to the old shift, the 48-96 shift interfered significantly less with leisure activities, household activities, and non-household activities like going to the bank.
- Over half (52%) of the members thought that the overall advantages of the old schedule outweighed its disadvantages, however, a significantly greater proportion of members (68%) felt that the overall advantages of the 48-96 outweighed its disadvantages.
- Use of caffeinated beverages and alcohol remained the same after the change.
- The majority of families liked the 48-96. They noted that the shift made it much easier to do special projects around the home, participate in leisure time activities, take personal time for themselves, and spend time together as a family.
- The majority of families felt that the 48-96 shift did not adversely affect their time together as a family or as a couple, nor did it put a strain on their relationship or their children.
- Very few families reported being adversely affected by the shift change with regard to changing to less satisfactory child care arrangements, elder care arrangements or visitation rights.
- Not all the members like the 48-96 shift and it has made accomplishing household tasks and taking care of children more difficult for some families.

Figures

Figure 1. Total hours sleep per week, on-line personnel, December '05 vs. July '06 (n=69)

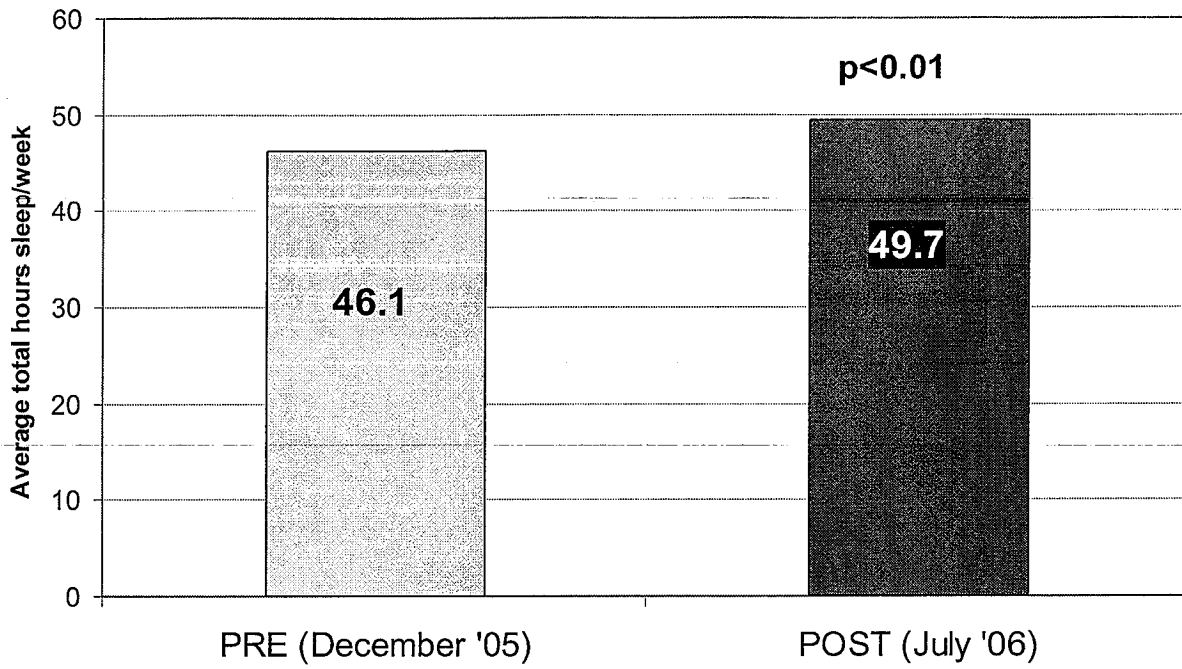


Figure 2. Average number of hours sleep per night, on-line personnel, on and off shift, December '05 vs. July '06 (n=69*)

