

Phase I Report of the Comprehensive Review of the Public Safety Communications Center

COUNTY OF DANE, WISCONSIN



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1. INTRODUCTION AND EXECUTIVE SUMMARY

The Matrix Consulting Group was retained by the County of Detain to conduct a Comprehensive Review of the Public Safety Communications Center (PSCC). The Dane County PSCC is responsible for handling incoming 911 and other phone calls related to fire, EMS and law enforcement emergencies and incidents for the City of Madison and many other communities in the County. A detailed summary of the clients and agencies serviced by the PSCC is provided in the first chapter of this report.

The County requested that the Matrix Consulting Group conduct this work in two distinct phases:

- **Phase 1** is intended to address our analysis of overall staffing and space requirements for the PSCC. These two vital questions are being addressed in on-going budgetary negotiations and development.
- **Phase 2** is focused on the management systems and processes utilized to oversee and guide the operations and services delivered by the PSCC. This report will be developed in early 2009.

The Matrix Consulting Group conducted our work using the following key approaches:

- Conducted interviews and observations within the PSCC.
- Collected and analyzed detailed descriptive data describing the staffing, deployment and workload of the Center.
- Conducted interviews with a representative sample of client agency managers seeking their opinions on the services offered by the Center.
- Developed a detailed descriptive profile of operations in the PSCC. This was reviewed by staff to ensure the accuracy of our base information.
- We have developed and distributed two surveys – one for employees of the PSCC and one for client agencies to complete. These surveys are on-going at this time and the results will be included in the Phase II report.

EXECUTIVE SUMMARY

The Phase I report focuses on the staffing and space requirements of the Public Safety Communications Center. The key findings and recommendations included in this report are summarized, below:

- An increase in staffing for the PSCC should be approved. Adding 9 additional Communicator positions to the Center's authorized complement will improve the operational efficiency of the Center. Current staffing levels are insufficient to provide for workload and policy driven staffing objectives without relying on overtime. This need for increased staffing is largely driven by very low net availability for the Communicators in the PSCC.
- The Center Board and the client agencies should consider the public policy question of the staffing level assigned to fire and EMS agencies. The workload analysis suggests that a single console would be sufficient, on average, to handle this workload. Balancing these issues against other public policy concerns should be addressed openly as part of the overall deployment strategy and service delivery approach adopted by the PSCC.
- The floor space that is available in the PSCC at this time is sufficient to allow for significant expansion (from 13 to 21 consoles) within the same footprint. Our analysis concurs with that of the County's architects and engineers who are examining the space needs of the Center concurrent with our analysis.

The following chapter provides a Descriptive Profile of current operations, staffing, deployment and workload in the PSCC.

2. DESCRIPTIVE PROFILE OF THE PUBLIC SAFETY COMMUNICATIONS CENTER

This Descriptive Profile summarizes a number of key facts related to the Dane County Public Safety Communications Center (DCPSCC), staffing, workload and other key descriptors. This information serves as the foundation upon which the analyses of staffing and space requirements were developed. Phase II of the Dane County Emergency 9-1-1 Communications Study will focus on Center Management and will formally begin January 2009. While not underway, many elements in the analysis of staffing and space requirements are management related.

Data contained in the Profile was developed based on site work conducted by the project team, including:

- Interviews with Communication staff, including the Operations Manager and Support Services Managers to understand roles and responsibilities, etc
- Observation of Communicators and Communications Supervisors taking 9-1-1 calls through completion of the emergency response
- Interviews with various members of the PSCC Center Board and Senior members of departments receiving dispatch services from Dane County
- Collection of data from the Public Safety Communications' Computer Aided Dispatch (CAD), Dictaphone, Communications logger equipment, memorandums, etc

The next section in this Profile provides a summary on the background and history of the DCPSCC

1. RELATIONSHIP OF THE PUBLIC SAFETY COMMUNICATIONS CENTER TO THE COUNTY OF DANE AND TO THE OTHER AGENCIES TO WHICH IT PROVIDES SERVICES.

The PSCC is managed and staffed by the County of Dane and is largely funded from countywide tax revenue sources. The Center provides 9-1-1 call taking and emergency dispatching (as well as combinations of those services) to dozens of agencies in Dane County ranging from the largest City in the County (Madison) to many of the smallest communities in the County. The exhibit, which follows, provides a summary of the agencies by type to which services are delivered by the PSCC:

Law Enforcement (Primary)	Law Enforcement (Supported)	Fire	EMS	Other
City of Madison	Fitchburg	City of Madison	Belleville EMS	Dane County Coroner
				Dane County Emergency Management
Dane County Sheriff	Middleton	Fitchburg	Brooklyn EMS	Public Health of Madison & Dane County ASO
Belleville PD	Monona	Middleton	Cambridge EMS	Dane County Parking Ramp
Blue Mounds PD	Sun Prairie	Monona	Cross Plains EMS	Wisconsin Department of Natural Resources
Brooklyn PD	Stoughton	Sun Prairie	Deer-Grove EMS	Federal Bureau of Investigation
Cottage Grove PD	University of Wisconsin	Stoughton	Deforest EMS	US Marshal
Cross Plains PD	Wisconsin Capital Police	Belleville FD	Madison Town EMS	Wisconsin Probation and Parole
Deerfield PD	Wisconsin State Police	Black Earth FD	Maple Bluff EMS	US Secret Service
DeForest PD		Brooklyn FD	Marshall EMS	Dane County Animal Control
Madison Town PD		Cambridge FD	McFarland EMS	
Maple Bluff PD		Cottage Grove FD	Mount Horeb EMS	
Marshall PD		Cross Plains FD	Oregon EMS	
McFarland PD		Deerfield FD	Shorewood Hills FD	

Law Enforcement (Primary)	Law Enforcement (Supported)	Fire	EMS	Other
Mount Horeb PD		DeForest FD	Shorewood Hills EMS	
Oregon Village PD		Madison Town FD	Stoughton EMS	
Oregon Constable		Maple Bluff FD	Shorewood Hills EMS	
Shorewood Hills PD		Marshall FD	Stoughton EMS	
Verona PD		McFarland FD	Waunakee Area EMS	
Waunakee PD		Mount Horeb FD		
		Oregon FD		
		Shorewood Hills FD		
		Stoughton FD		
		Verona FD		
	Waunakee FD			

Several points provide a quick summary of the information presented in the preceding exhibit:

- Nineteen (19) law enforcement agencies use the PSCC for primary communication to include receiving 9-1-1 calls, dispatch of responders, provide resources as requested by on-scene personnel, relay sensitive information and communication log/data management.
- Eight (8) law enforcement agencies employ to some degree of communication services from the PSCC. Services provided vary from answering 9-1-1 lines and transferring information to the independent agency to providing access for one agency to speak to another on a single communications channel.
- Twenty-four (24) fire departments receive primary communications from the PSCC. Staffing for individual departments differ from career employees, career and volunteer combination to volunteer personnel. Staffing models may effect how quickly an emergency resource is staffed and responding to the emergency.

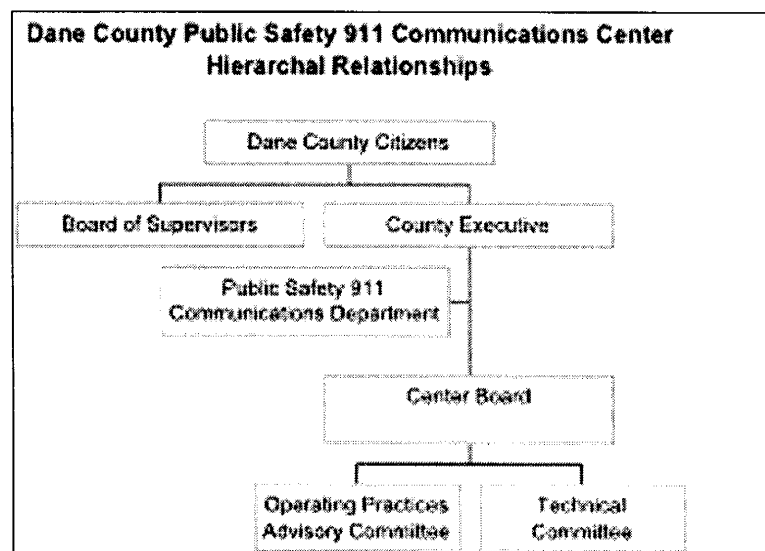
- Twenty-one (21) pre-hospital Emergency Medical Services providers receive primary communications from the PSCC. All ambulances operating in Dane County have Automatic Vehicle Locators (AVL) that allows the PSCC to evaluate the physical location of the ambulance in relation to the emergency.

The current design of the Dane County 911 PSCC is a result of a consolidation of dispatch centers from the Dane County Sheriff's Office, to include rural fire departments, the City of Madison Police Department, and the City of Madison Fire Department. On July 3, 1988, an agreement made between Dane County and the City of Madison established the PSCC. This was a 20-year agreement and the term ended in July 2008. On July 17, 2008, the Dane County Board of Supervisors extended the agreement by approving Resolution 67, 08-09 Authorizing Extension of Agreement Between City of Madison and County of Dane Regarding 911 Center Dispatch Functions for a term of six months while the two parties continue negotiations for a longer-term agreement.

As independent agencies, the Sheriff's Office and the two Madison departments created their respective policy and procedures for agency dispatch. Under a consolidated approach, a governance oversight was required to ensure equitable representation from stakeholders as it related to operational decisions, funding and other ancillary communications activities.

To address this concern the Dane County Board of Supervisors created the Public Safety Communications Center Board or commonly known as the Center Board. Substitution 4 to Resolution 123, 1985-86, DESIGNATING A SITE AND ESTABLISHING A GOVERNING BOARD FOR THE CONSOLIDATION OF DANE COUNTY AND CITY OF MADISON PUBLIC SAFETY COMMUNICATIONS established criteria for roles, responsibilities, memberships and authority to appoint members.

According to Chapter 33 of the Dane County Code of Ordinances, the E 9-1-1 telephone system is administered by the Public Safety Communications Department under the direction of its director and subject to the authority of the County Executive and of the Public Safety Communications Center Board. Chapter 15 of the Dane County Code of Ordinances delineates the duties of the Center Board to include participation in the hiring of the Director's position by certifying a list of qualified candidates to the County Executive, establishing operating practices of the department, and review of the annual budget proposal. When the County Board established the Center Board, it also created the Public Safety Communications Operating Practices Advisory Committee to advise the Center Board. In recent years, the County Board adopted an ordinance to create the Public Safety Communications Center Technical Committee, which reviews technology issues and projects pertaining to public safety communications and forwards recommendations to the Center Board.



The Board of Supervisors is the legislative body for Dane County and is composed of 37 supervisors elected by their respective district. As it relates to the PSCC, the responsibility of the Board of Supervisors include:

- Confirm the recommendation of the County Executive in naming the PSCC Department Director.
- Confirm the County Executive's appointees to the Center Board, and the Operating Practices Advisory Committee.
- Consider and approve the annual budget for the Public Safety Communications Department.
- Provide policy direction through resolutions and ordinances.

The Dane County Executive is an elected position that serves as the chief executive officer of the county and directs all administrative and management functions of county government not vested in other elected officers. The Public Safety Communications Department Director reports to the County Executive. Responsibilities for the County Executive as it relates to the PSCC are:

- Appoints the Director of the Public Safety Communications Department.
- Recommends an annual budget to the Board of Supervisors.
- Appoints two of the members as follows:
 - A member of the County Board's Public Protection and Judiciary Committee.
 - An elected official not currently a member of the County Board representing a County municipality, excluding the City of Madison.
- Appoints eight of the 11 members to the Operating Practices Advisory Committee, although several of those members are first selected by associations as their representative and then appointed by the Executive.

The Center Board was originally six members. Membership expanded to six voting and two non-voting members in 2002 and since has further expanded to twelve

voting members and two non-voting members in response to the 2004 Dane County 911 Public Safety Study Communications Strategic Plan. The four additions to the Center Board include an elected official representing a municipality outside the City of Madison and not on the Dane County Board of Supervisors. The following table lists Center Board membership and voting privileges:

Dane County Sheriff or Designee*	Voting Member
Madison Police Chief or Designee	Voting Member
Madison Fire Chief or Designee	Voting Member
Madison EMS Chief or designee	Voting Member
Dane County EMS Association Representative**	Voting Member
Dane County Fire Chiefs' Association Representative**	Voting Member
Dane County Police Chiefs' Association Representative**	Voting Member
Aldermanic - Madison Public Safety Review Board	Voting Member
Dane County Board of Public Protection & Judiciary Committee Representative**	Voting Member
Madison Information Services Director or designee	Voting Member
Madison Communications Section of the City of Madison Traffic Engineering Division Supervisor or Designee	Voting Member
Elected Official from local Municipality, with Designated Alternate**	Voting Member
Chair of the PSCC Advisory Committee	Non-Voting Member
Chair of the PSCC Chair Technical Committee	Non-Voting Member

* Serving Chairperson

** Non-City or County Affiliation

As shown in the preceding table, the membership of the Center Board is a representation of organizations using the PSCC for communications services, elected officials and county and city departmental staff. This makeup meets the governance test for equal representation of all stakeholders receiving services from the PSCC.

Described in the Dane County Code of Ordinances, Section 15.34, PUBLIC SAFETY COMMUNICATIONS CENTER BOARD, the Center Board will have twelve

voting members. Center Board members elect their own Chairperson and vice-Chairperson in even-numbered years. Currently, the Dane County Sheriffs Office Chief Deputy is serving his second term as Center Board Chairperson.

Pursuant to County Ordinance, the Center Board is a policy-proposing body. Areas for recommendation are, but not limited to, system-management policies for city and county communication systems, system replacements, expansions or modifications, additional frequencies and disposition of surplus equipment. Additional roles and responsibility of the Dane County PSCC Board include:

- Establish selection criteria for the Director's position, interview qualified applicants and provide a ranked list of qualified candidates to the County Executive.
- Establish the operating practices of the Department of Public Safety Communications, but that does not extend to personnel policies with the exception of the Director or decisions with major fiscal impact.
- Review and amend the Director of Public Safety's proposed budget, before submission to the County Executive.
- Receive input and consider agenda items submitted by the Operating and Practices Advisory Committee and the Technical Committee.
- Make recommendation(s) to the Madison Common Council and the County Board on communication matters requiring legislative action.
- Review the PSCC training plan.
- Review complaints against the PSCC.

Two groups support the Center Board by serving as the PSCC Operating Practices Advisory Committee and the PSCC Center Technical Committee. The Operating Practices Advisory Committee has a membership of 11 persons while the Technical Committee has 12 members. Each member serves a two-year term.

The Operating Practices Advisory Committee membership is as follows:

Dane County Sheriff or Designee
Dane County Police Chiefs' Association Representative
Dane County Fire Chiefs' Association Representative
Madison Police Chief or Designee
Emergency Medical Services Commission Representative
Dane County EMS Association Representative
Madison Fire Chief or Designee
Director of Dane County Emergency Government
Communicator representative from PSCC Operations Division
Dane County Resident with special interest in Communications
Municipal Police Chief representing departments without 24-hour Dispatch Center

The primary responsibilities of the Operating Practices Advisory Committee are:

- Review operating issues and making recommendations on such to the Center Board.
- Participation in operational planning for the PSCC.

As outlined in Dane County Ordinance 15.34 (12), the Technical Committee reviews technology issues and projects pertaining to the public safety communications. Findings and recommendations are forwarded to the Center Board for discussion and if applicable, for action.

Memberships on the Dane County Public Safety Communications Technical Committee are:

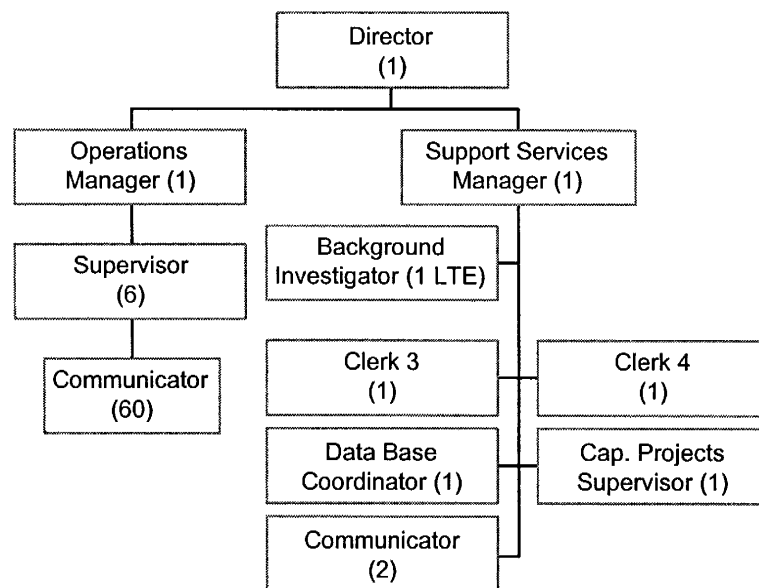
Dane County Sheriff or Designee
Dane County Police Chiefs' Association Representative
Dane County Fire Chiefs' Association Representative
Madison Police Chief or Designee
Madison Information Services Director or Designee
Dane County Director of Administration or Designee
Madison Radio Shop Manager or Designee
Madison Fire Chief or Designee
Dane County Director of Public Safety Communications or Designee
Dane County Director of Emergency Management or Designee
Dane County EMS Association Representative or designee

The next section begins to provide a summary of current operations and staffing in the PSCC.

2. ORGANIZATION AND STAFFING OF THE EMERGENCY PSCC

The PSCC is a Department under the Dane County Executive. Budget approval comes from the Dane County Board of Supervisors and County Executive. The approved budget for fiscal year 2008 was \$5,283,230, which included 73 fulltime positions including the Department Director and two Division Managers. Additionally, Limited Term Employees (LTE) for Background Investigations were included in PSCC staffing. The PSCC Department has two divisions, Operations and Support Services. Allocation of employee resources between the two divisions was as follows: 66 positions in Operations and 6 positions in Support Services, including division managers. One Department Director oversees both Divisions. At the time of this assignment the Director position is being filled in an interim capacity.

The following table of organization graphically shows distribution of personnel:



In 2007, 71 fulltime positions staffed the PSCC. Two additional positions increased approved staffing to 73 in the adopted 2008 budget. Four additional positions were added mid-year for a compliment of 77 fulltime positions in PSCC. Positions added in 2008 are:

- One Communications Supervisor – Support Services.
- Two Communicators – Support Services.
- Three Communicators – Operations.

Added positions enhanced Support Services in the area of Quality Assurance and assisted Communicators in Operations. Two of the additional two full-time Communicator positions approved mid-year (June 2008) were 'Pre-Hire' positions. The purpose is to have sufficient back-fill of quality employees to avoid paying overtime cost during new-hire training.

The following staffing table identifies PSCC approved full-time equivalent positions between 2007, 2008, positions added by resolution 2008, and the County Executive's proposed 2009 budget:

POSITION	Authorized 07	Authorized08	Resolved 08	County Exec. Proposed 09
Director	1	1	1	1
Manager - Operations	1	1	1	2
Manager - Support Services	1	1	1	1
Clerk 3	1	1	1	1
Clerk 4	1	1	1	1
Data Base Coordinator - Support	1	1	1	1
Communications Supervisor – Support Services	0	1	1	1
Communicator – Support Services	0	1	2	3
Communications Supervisor - Operations	6	6	6	6
Communicator - Operations	59	59	62	66
Background Investigators	LTE*	LTE*	LTE*	LTE*
Total				
* Limited Time Employee	71	73	77	83

It is important to understand the primary duties and responsibilities of each position when comparing positions and evaluating their relative positions in the hierarchal structure. The following table summarizes the primary duties and responsibilities of each position assigned to the PSCC.

Position / Classification	Positions	Key Roles and Responsibilities
Director	1	<ul style="list-style-type: none">• Plans, directs and administers operation.• Directs the supervision, training and personnel administration for Center.• Prepares and submits annual operating budget recommendations.• Staff support to the Public Safety PSCC Board, Operating Practices and Advisory Committee and Public Safety Communications Technology Committee.
Manager - Operations	1	<ul style="list-style-type: none">• Oversees and coordinates the day-to-day activities of the 9-1-1 operations center Coordinates the maintenance of all public safety radio, computer aided dispatch, telephone and logger recorder systems.• Assists in the preparation and management of annual operating budget.• Serves as director when director is not available.
Manager - Support Services	1	<ul style="list-style-type: none">• Administers departmental quality assurance program.• Develops, maintains and monitors documentation and procedural standards.• Produces case reviews, monitors quality of services provided to customers, recommends corrective actions.• Coordinates New Hire Academy and Continuing Education.
Communications Supervisor – Support Services	1	<ul style="list-style-type: none">• Communication Supervisor assigned to Support Services Division.• Management for console replacement and other special projects.• Staff support to Governance Steering Committee.

Position / Classification	Positions	Key Roles and Responsibilities
Database Coordinator	1	<ul style="list-style-type: none"> • Prepares reports and data queries from CAD, telephony, Quality Assurance, and Priority Dispatch software. • Identifies and documents system problems, recommend solutions and request modifications to systems. • Conducts training on new and existing applications for Department and user agency staff. • Develops and maintain user manuals; at the discretion of the manager.
Communicator - Support	2	<ul style="list-style-type: none"> • Manages scheduling for all advance requests for leave, identifies and provides coverage for vacancy. • Issues overtime notice and coordinates with Operational Communications Supervisor for vacancies remaining unfilled. • Prepares, manages and submits payroll. • Applies Bargaining Agreement criteria in all Scheduling and Payroll practices. • Evaluates 25 Medical & Fire QA audits weekly. • Performs QA audits on approximately 25 random (3%) of Law Enforcement communications. • Evaluate QA audits upon special request.
Communications Supervisor - Operations	6	<ul style="list-style-type: none"> • Supervise dispatch personnel and direct and monitor dispatch activities. • Train employees on new or changed methods and procedures. • Maintain personnel and computer system records and procedures manuals.
Communicator - Operations	62	<ul style="list-style-type: none"> • Receive, evaluate, document and prioritize information and calls for emergency services. • Provide emergency medical and fire pre-arrival instructions. • Monitors location and status of public safety personnel and equipment. • Monitors radio channels.

The following points summarize this information

- Three senior level managers provide leadership for the PSCC.
- Seven first line supervisors provide day-to-day direction in both the Operations and Support Services Divisions.
- Positions added in 2007 and 2008 address concerns for greater oversight in quality assurance, scheduling, overtime and training.

The following exhibit shows both the shift start times (the PSCC operates with six distinct start times) and the targeted communicator staffing levels for each shift:

**Shift Start Times for the PSCC
With Targeted Communicator Staffing Levels**

Time	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
0645	11	11	11	11	11	10	10
1045	13	13	13	13	13	11	11
1445	13	13	13	13	13	13	13
1845	13	13	13	13	13	13	13
2245	11	11	11	11	11	11	11
0245	9	9	9	9	9	9	9

A review of the table shows that the shifts start at 15 minutes before the hour – this is done to ensure continuity of coverage and to overlap slightly shift changes in the public safety service providers in the field. The second key is to note that the number of personnel targeted for each start time varies between nine (9) and 13 personnel. These personnel are deployed between a wide variety of positions on the floor of the center including call taking and dispatching, as noted, below:

**Shift Start Times
With Weekday Deployment of Personnel by Function**

Time	Call Taking	Madison PD	County/Municipal Law Enforcement	Madison FD & EMS	County/Municipal Fire Departments & EMS	Data	Parking
0645	4	1	1	1	1	2	1
1045	6	1	1	1	1	2	1
1445	6	2	1	1	1	2	0
1845	6	2	1	1	1	2	0
2245	4	2	1	1	1	2	0
0245	3	1	1	1	1	2	0

This shows that the PSCC variably deploys personnel in a number of positions.

These key changes are noted, below:

- The number of Communicators assigned to call taking generally varies between three (3) and six (6) personnel with 12 hours a day having six (6) call takers.
- The number of Communicators working the Madison PD radio channels varies between one (1) and two (2) per hour with the day evenly split. When the second

Communicator is assigned to the Madison PD channels, the City is split operationally to address the number of personnel working in patrol and other functions.

- The number of personnel assigned to the County / Municipal law enforcement channel and to both Fire channels remains constant at one (1) per position throughout the day. The only variations are that an additional Communicator may be assigned to monitor tactical channels during large working fires or other major fire / rescue events.
- While two (2) personnel are assigned to the Data position, it is important to recognize that these positions are also in the queue for call taking. This may interrupt their ability to respond to data requests from the field (though personnel in most agencies do have in-car computers to perform basic records checks in situations where their safety will not be impacted by doing so).
- The Parking Enforcement channel is monitored only when Parking Enforcement personnel work, business hours, Monday-Friday. This position also serves as a back-up call taker when workload requires.

The following exhibit provides a summary of the “net availability” for Communicators in the PSCC. Net availability is defined as the time remaining after all leaves, training and other absences are subtracted from scheduled work hours:

Net Availability Calculation for Communicators in the PSCC Based on 2007 Personnel Data

Communicator	Notes / Description
1,946.67	Total hours for one full time employee
210.64	Average vacation and holiday leave (total hours)
62.58	Average sick leave (total hours)
30.72	Average personal leave (total hours)
2.07	Average training leave (total hours)
19.00	Average military, FMLA leave, etc. (total hours)
162.22	Average lunch and break (total hours)
13.57	Average other (meetings, light duty, special assignments, etc.)
500.81	Total unavailable time = Total B through H
1,445.86	Net Available Work Hours (NAWH) = A – I
1,445.86	Net Available Work Hours per employee (NAWH from J above)

This table shows that the Communicators, in 2007, were available 1,446 hours out of the 1,947 hours they were scheduled to work (this does not include overtime). This is equivalent to a net availability of 75% - or conversely, that personnel are not

available to work 25% of the time. This is a critical figure that goes directly to the number of total fulltime equivalents required to staff a given 24-hour position:

Factor	Impact
Hours / Year for One Post	8,760.0
Net Availability	1,445.9
Positions Required to Cover	6.1

This shows that it takes approximately 6.1 personnel (FTE's) to cover each 24 hour post in the PSCC – with a minimum of overtime expended. This figure also does not account for the impact of turnover and training of new personnel (which in dispatch operations can have a major impact on staffing and overtime utilization). The use of overtime for the past several years in the PSCC is shown in the following exhibit – note that the CY2008 figure has been annualized for illustrative purposes:

<u>Use of Overtime</u>	<u>CY2006</u>	<u>CY2007</u>	<u>CY2008</u>	<u>CY08 Annualized</u>
Floor Coverage				
Comp.	12.00	20.00	8.00	12.00
FMLA	1,108.00	714.50	296.83	445.25
Shift Short	3,977.21	6,191.96	5,513.69	8,270.54
Sick Leave	3,124.75	2,967.48	1,663.08	2,494.62
Special Events	320.50	271.73	339.34	509.01
Special Projects	69.25	33.25	18.00	27.00
Training CTO	212.50	113.50	74.00	111.00
Training EMD	33.25	120.25	5.00	7.50
Training Other	548.00	922.50	41.50	62.25
Union Time Off	48.00	24.00	4.00	6.00
Vacation	2,677.92	2,760.83	1,046.50	1,569.75
Wellness Day Off	8.00	4.00	2.00	3.00
Subtotal	12,139.38	14,144.00	9,011.94	13,517.91
Other Uses				
Meeting CTO	22.00	16.00	10.00	15.00
Meeting EMD	0.00	0.00	0.00	0.00
Meeting Other	4.00	17.75	35.25	52.88
Special Event	21.75	36.50	36.00	54.00
Special Project	0.00	43.75	0.00	0.00
Training CTO	0.00	30.75	15.75	23.63
Training EMD	0.00	2.50	15.00	22.50
Training Other	159.75	0.00	596.25	894.38
Subtotal	207.50	147.25	708.25	1,062.38
Grand Total	12,346.88	14,291.25	9,720.19	14,580.29

Notes: Excludes supervisors. CY2008 does not include full year

This shows that the PSCC is on track to use more than 14,580 hours of overtime during the coming year – equivalent to the net available time of almost 10.1 positions. Indeed, almost 57% of the total overtime projected for CY2008 will be the result of a shift staffing shortage – above and beyond vacation and sick leave issues. This indicates that insufficient staffing may be available to the center given the level of leave and turnover in the PSCC.

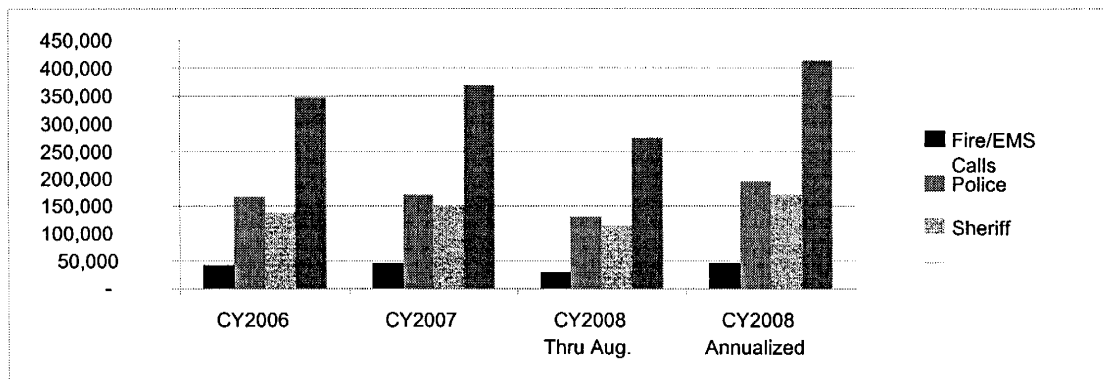
3. THE WORKLOAD HANDLED BY THE PSCC.

This section of the Profile of the PSCC provides the workload of the PSCC. These data were developed from the computer aided dispatch (CAD) system as well as telephone and radio computer systems maintained by the PSCC. Where possible, the Matrix Consulting Group relied on raw data taken directly from these sources. The first exhibit provides a summary of the total incidents handled by the PSCC over the past several years: Although some what time consuming, I believe that the Fire and EMS calls should be separated to show disciplines' actual call for service usage.

Calls for Service	CY2006	CY2007	CY2008 Thru Aug.	CY2008 Annualized
Fire/EMS Calls	42,709	45,656	30,953	46,430
Police	167,418	171,551	130,355	195,533
Sheriff	137,225	152,070	114,178	171,267
Total CFS	347,352	369,277	275,486	413,229

Fire/EMS Calls include both types of calls handled in and outside the City of Madison. Police calls mainly include the City of Madison Police Department. Sheriff calls include those for the Sheriff's Office as well as other municipal police departments dispatched by the center. Note that the trend in the Center has been an increasing number of calls for services – rising from 347,352 in CY06 to a projected total of more than 413,000 in CY08. Some of these increases are due to procedural changes, such

as the Madison Police Department's increased logging of certain self-initiated activities as of February 4, 2008. These are significant increases in workload that will reflect on other performance measures. The exhibit, below, provides a graphical summary of this information:



The next exhibits show the distribution of calls for services across all hours of the day for the three classifications:

Agency	Dispatch Hour	2006	2007	2008 *	Grand Total
Fire/EMS	0000	2,311	2,238	1,454	6,003
	0100	1,294	1,369	880	3,543
	0200	1,400	1,428	824	3,652
	0300	1,082	1,030	700	2,812
	0400	836	852	603	2,291
	0500	826	915	576	2,317
	0600	1,081	1,118	758	2,957
	0700	1,478	1,695	1,161	4,334
	0800	1,848	1,992	1,400	5,240
	0900	1,937	2,112	1,460	5,509
	1000	2,154	2,244	1,599	5,997
	1100	2,177	2,345	1,660	6,182
	1200	2,164	2,464	1,633	6,261
	1300	2,098	2,332	1,582	6,012
	1400	2,236	2,325	1,545	6,106
	1500	2,189	2,419	1,629	6,237
	1600	2,229	2,405	1,684	6,318
	1700	2,255	2,487	1,762	6,504
	1800	2,225	2,315	1,609	6,149
	1900	2,115	2,226	1,506	5,847
	2000	1,943	2,164	1,443	5,550
	2100	1,795	1,982	1,375	5,152
	2200	1,682	1,730	1,186	4,598
	2300	1,354	1,469	924	3,747

COUNTY OF DANE, WISCONSIN**Phase I Report – Comprehensive Study of the Public Safety Communications Center**

Agency	Dispatch Hour	2006	2007	2008 *	Grand Total
Fire Total		42,709	45,656	30,953	119,318
Police	0000	29,571	31,154	21,280	82,005
	0100	4,670	4,801	4,003	13,474
	0200	4,704	4,493	3,579	12,776
	0300	3,335	3,073	2,409	8,817
	0400	2,039	2,023	1,706	5,768
	0500	1,528	1,555	1,233	4,316
	0600	2,341	2,256	1,930	6,527
	0700	4,495	4,722	3,471	12,688
	0800	6,370	6,428	4,993	17,791
	0900	6,657	6,785	5,191	18,633
	1000	6,831	7,061	5,311	19,203
	1100	7,101	7,170	5,407	19,678
	1200	7,187	7,355	5,491	20,033
	1300	6,304	6,348	4,638	17,290
	1400	6,953	7,329	5,492	19,774
	1500	9,894	10,097	7,816	27,807
	1600	8,681	8,885	6,988	24,554
	1700	8,342	8,740	6,612	23,694
	1800	7,524	7,869	5,991	21,384
	1900	7,142	7,342	5,801	20,285
	2000	7,157	7,241	5,813	20,211
	2100	6,157	6,244	4,741	17,142
	2200	5,651	5,832	4,878	16,361
	2300	6,784	6,748	5,580	19,112
Police Total		167,418	171,551	130,354	469,323
Sheriff	0000	26,371	30,666	27,355	84,392
	0100	3,764	4,858	3,582	12,204
	0200	3,487	4,346	3,059	10,892
	0300	2,259	3,164	2,306	7,729
	0400	1,733	2,585	2,133	6,451
	0500	1,727	2,244	1,775	5,746
	0600	2,214	2,343	1,731	6,288
	0700	3,926	4,629	3,118	11,673
	0800	5,018	5,375	3,892	14,285
	0900	5,088	5,392	3,820	14,300
	1000	5,254	5,540	3,912	14,706
	1100	5,280	5,704	3,968	14,952
	1200	5,531	5,731	4,095	15,357
	1300	5,222	5,538	4,119	14,879
	1400	5,338	5,817	4,185	15,340
	1500	6,911	7,227	5,000	19,138
	1600	7,157	7,469	5,364	19,990
	1700	7,277	7,434	5,418	20,129
	1800	6,320	6,437	4,589	17,346
	1900	5,877	6,321	4,308	16,506
	2000	6,150	6,386	4,473	17,009
	2100	5,781	6,441	4,356	16,578

Agency	Dispatch Hour	2006	2007	2008 *	Grand Total
	2200	5,089	5,344	3,828	14,261
	2300	4,451	5,083	3,792	13,326
Sheriff Total		137,225	152,074	114,178	403,477
Grand Total		347,352	369,281	275,485	992,118

* Not annualized for 2008.

The calls for service for all three classification (fire, police, sheriff) indicate a general pattern of peak activity during normal business and family hours (from 0600 – 0000). A similar review of the data on a day of week basis (not provided) shows that there is little variation in the with a range of 12% (Sunday) to 16% (Friday) of workload with the weekdays and Saturday ranging between 14% and 15%.

The next series of exhibits indicates the performance of the Center in terms of call processing time (this is the elapsed from the answering the phone until the call is initially sent to the appropriate dispatcher(s) for unit assignment). These are provided on the following page:

2006 Average Call Process Times				
Priority		Police	Sheriff	Fire/EMS
High	2	1.05	1.30	1.04
High	3	1.05	1.21	1.68
Medium	4	1.31	1.24	1.22
Medium	5	1.13	0.91	0.86
Medium	6	1.06	0.51	1.15
Low	7	0.96	0.44	1.73
Low	8	0.83	0.84	0.80
Low	9	0.65	0.88	0.86

2007 Average Call Process Times				
Priority		Police	Sheriff	Fire/EMS
High	2	1.17	1.47	1.31
High	3	1.13	1.24	1.69
Medium	4	1.33	1.30	1.66
Medium	5	1.16	0.86	1.72
Medium	6	1.10	0.56	1.84
Low	7	0.99	0.43	1.50
Low	8	0.76	0.79	0.80
Low	9	0.94	1.04	0.91

2008 Average Call Process Times				
Priority		Police	Sheriff	Fire/EMS
High	2	1.24	1.60	1.52
High	3	1.17	1.27	1.74
Medium	4	1.36	1.35	1.76
Medium	5	1.16	0.99	2.02
Medium	6	1.09	0.67	1.93
Low	7	0.66	0.41	1.97
Low	8	0.79	0.96	0.73
Low	9	0.93	1.06	0.93

A review of these data show several key issues:

- The Communicators are processing the highest priority calls very quickly – in fact in less than one minute.
- Other calls are taking longer than a minute until they reach the very lowest of priorities.
- Fire / EMS calls take longer to process and initially send to the dispatcher – likely due to the use of Priority Medical and Fire Medical protocols which require the Communicators to ask a longer series of questions before the call can be properly classified and sent to the dispatcher for assignment. These systems are

intended to reduce errors in processing and to assign an appropriate level of priority to the responders based on the best available information.

- A clear upward trend in call processing time for fire / EMS calls can be seen in comparing 2007 with 2008 data. It is not clear whether there has been a similar trend in law enforcement call processing.
- It is not practical given current CAD software to break out fire and EMS calls. These data are included in text fields along with other comments, making data analysis impractical.

This is a key measure upon which management decisions should be made regarding the implementation of new technologies, call processing approaches, etc. Another measure of performance is to examine the amount of time which elapses prior to an incoming 9-1-1 call being answered. The following exhibit shows a sample of 21 days across the past year:

<u>9-1-1 Talk Time</u>	<u>2/20/2008</u>	<u>2/21/2008</u>	<u>2/22/2008</u>	<u>2/23/2008</u>	<u>2/24/2008</u>	<u>2/25/2008</u>	<u>2/26/2008</u>	<u>Weekly Total</u>
Daily Call #	561	470	613	502	452	429	506	3533
Daily Time Total (Seconds)	55,539	48,410	39,232	53,212	50,172	45,474	51,612	343,651
Average Talk Time	99	103	64	106	111	106	102	98.71
	<u>6/20/2008</u>	<u>6/21/2008</u>	<u>6/22/2008</u>	<u>6/23/2008</u>	<u>6/24/2008</u>	<u>6/25/2008</u>	<u>6/26/2008</u>	<u>Weekly Total</u>
Daily Call #	495	464	482	487	498	472	639	3537
Daily Time Total (Seconds)	56,925	56,608	53,020	52,109	51,294	51,920	65,817	387,693
Average Answer Time	115	122	110	107	103	110	103	110.00
	<u>9/20/2008</u>	<u>9/21/2008</u>	<u>9/22/2008</u>	<u>9/23/2008</u>	<u>9/24/2008</u>	<u>9/25/2008</u>	<u>9/26/2008</u>	<u>Weekly Total</u>
Daily Call #	664	545	429	434	425	505	530	3532
Daily Time Total (Seconds)	69,720	66,490	50,622	56,854	52,275	58,075	62,010	416,046
Average Talk Time	105	122	118	131	123	115	117	118.71

A review of these data shows that the average wait time for a 9-1-1 caller is less than eight (8) seconds with some variability which is only partially dependent on total volume of incoming calls (many factors can impact call answer time). This shows that the typical 9-1-1 call takes approximately 1.83 minutes (longer than the call processing time shown on the preceding pages).

It is also interesting to note the amount of time being spent on incoming phone calls by the Communicators (this is different than call processing time which is measured by the CAD system). These sample data are shown, below:

<u>Non-9-1-1 Talk Time</u>	<u>2/20/2008</u>	<u>2/21/2008</u>	<u>2/22/2008</u>	<u>2/23/2008</u>	<u>2/24/2008</u>	<u>2/25/2008</u>	<u>2/26/2008</u>	<u>Weekly Total</u>
Daily Call #	1,383	1,292	1,422	1,241	984	1,269	1,241	8,832
Daily Time Total (Seconds)	91,278	80,104	91,008	76,942	65,928	76,140	73,219	554,619
Average Talk Time	66	62	64	62	67	60	59	62.86
	<u>6/20/2008</u>	<u>6/21/2008</u>	<u>6/22/2008</u>	<u>6/23/2008</u>	<u>6/24/2008</u>	<u>6/25/2008</u>	<u>6/26/2008</u>	<u>Weekly Total</u>
Daily Call #	1,492	1,288	1,103	1,448	1,404	1,351	1,472	9,558
Daily Time Total (Seconds)	110,408	88,872	73,901	91,224	96,876	94,570	94,208	650,059
Average Talk Time	74	69	67	63	69	70	64	68.00
	<u>9/20/2008</u>	<u>9/21/2008</u>	<u>9/22/2008</u>	<u>9/23/2008</u>	<u>9/24/2008</u>	<u>9/25/2008</u>	<u>9/26/2008</u>	<u>Weekly Total</u>
Daily Call #	1,375	1,083	1,300	1,223	1,243	1,325	1,364	8,913
Daily Time Total (Seconds)	93,500	71,478	87,100	81,941	85,767	80,825	91,388	591,999
Average Talk Time	68	66	67	67	69	61	67	66.43

This shows that the PSCC has been spending an increasing amount of time on the phone handling 9-1-1 calls, on average. This may be a result of several changes in policy regarding the handling of incoming calls as well as some software changes. At the same time, the project team examined the non-9-1-1 call talk time for the Communicators who are answering the phones. This is shown, below:

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<u>Non-9-1-1 Talk</u> <u>Time</u>	<u>2/20/2008</u>	<u>2/21/2008</u>	<u>2/22/2008</u>	<u>2/23/2008</u>	<u>2/24/2008</u>	<u>2/25/2008</u>	<u>2/26/2008</u>	<u>Weekly</u> <u>Total</u>
Daily Call #	1,383	1,292	1,422	1,241	984	1,269	1,241	8,832
Daily Time								
Total								
(Seconds)	91,278	80,104	91,008	76,942	65,928	76,140	73,219	554,619
Average Talk								
Time	66	62	64	62	67	60	59	62.86
-	<u>6/20/2008</u>	<u>6/21/2008</u>	<u>6/22/2008</u>	<u>6/23/2008</u>	<u>6/24/2008</u>	<u>6/25/2008</u>	<u>6/26/2008</u>	<u>Weekly</u> <u>Total</u>
Daily Call #	1,492	1,288	1,103	1,448	1,404	1,351	1,472	9,558
Daily Time								
Total								
(Seconds)	110,408	88,872	73,901	91,224	96,876	94,570	94,208	650,059
Average Talk								
Time	74	69	67	63	69	70	64	68.00
-	<u>9/20/2008</u>	<u>9/21/2008</u>	<u>9/22/2008</u>	<u>9/23/2008</u>	<u>9/24/2008</u>	<u>9/25/2008</u>	<u>9/26/2008</u>	<u>Weekly</u> <u>Total</u>
Daily Call #	1,375	1,083	1,300	1,223	1,243	1,325	1,364	8,913
Daily Time								
Total								
(Seconds)	93,500	71,478	87,100	81,941	85,767	80,825	91,388	591,999
Average Talk								
Time	68	66	67	67	69	61	67	66.43

3. ANALYSIS OF STAFFING AND SPACE REQUIREMENTS

The Matrix Consulting Group takes the general approach that staffing, wherever possible, should be related to two key factors: the workload to be handled by the staff in question and the public policy decisions made with regard to service levels for each facet of the operations.

1. METHODS FOR ANALYZING STAFFING

Assessing the number of personnel required to provide call-taking and dispatching services in a large center such as the PSCC requires analysis of several factors as well as several public policy decisions.

(1) How Long a Dispatcher Should Be Occupied with Workload Is a Function of Several Factors.

The calculation for net availability note previously essentially results in the amount of time each dispatcher is available to perform work. In any profession, however, no position is occupied 100% of the time. By example, many labor intensive professions, such as fleet mechanics, are ideally occupied 80% of the time performing direct work on vehicles. This helps ensure productivity and, in the private sector, profitability. More relevant to the public safety field, law enforcement agencies would typically strive for patrol staff to have from 45%-50% un-committed patrol time thereby allowing them to selectively work, in this “free time,” particular community-oriented problems. This proportion of un-obligated time also allows for patrol units to generally be available for relatively rapid response to community generated calls for service.

How much time is dedicated to actual work in the public safety dispatch field is a function of several inter-related variables. An allowance needs to be made regarding the proportion of time desirable to have a dispatcher actually involved in call handling, radio transmissions, keyboard entry, records research, etc. There are several reasons why direct task allocation should not be nearly 100%, including the following:

- Dispatch centers which have excessively high utilization levels tend to "burn-out" staff and consequently have high levels of employee turnover.
- Professions which require extreme concentration during work activities, such as dispatch, air traffic control, or other professions in which failure brings unacceptable risk, should have lower work utilization rates.
- Dispatch centers which have high utilization levels experience "queuing" problems in which responses to incoming telephone calls and radio transmissions are delayed because the dispatcher is pre-occupied with other concurrent workload.
- In dispatch centers with high utilization quality begins to suffer because dispatchers must cut calls and radio exchanges short, thereby impacting dispatcher effectiveness, perceived customer service, and potentially safety in the field for law enforcement, fire, and emergency medical response professionals.

Based on these variables the project team typically uses a utilization rate of **25-30%** for dispatchers. This implies that dispatchers will be busy performing work an average of 20 minutes per hour or one second every two seconds of net available time. It should be noted that this utilization or "occupancy rate" is one of the primary drivers in staffing requirements, particularly for larger dispatch centers. Modifying this variable by relatively small increments can have an important impact on staffing requirements. This will be noted throughout this chapter.

2. ANALYSIS OF STAFFING USING CURRENT DEPLOYMENT

The first approach that the project team utilizes is to assess the staffing required to meet the current deployment by the PSCC. In effect, we are asking the question: what level of staffing is required to efficiently staff operations in the Center? The questions that need to be addressed are the following:

- What is the availability of Communicators to meet staffing needs?
- What level of staffing is the PSCC deploying to meet expectations for service delivery?

The following exhibit shows the current level of net availability in the PSCC. Net availability is, simply explained, the total time left over after all leaves and other absences are subtracted from the hours that each Communicator is scheduled to work in a given year:

Based on 2007 Personnel Data

Communicator	Notes / Description
1,946.67	Total hours for one full time employee
210.64	Average vacation and holiday leave (total hours)
62.58	Average sick leave (total hours)
30.72	Average personal leave (total hours)
2.07	Average training leave (total hours)
19.00	Average military, FMLA leave, etc. (total hours)
162.22	Average lunch and break (total hours)
13.57	Average other (meetings, light duty, special assignments, etc.)
500.81	Total unavailable time = Total B through H
1,445.86	Net Available Work Hours (NAWH) = A – I
1,445.86	Net Available Work Hours per employee (NAWH from J above)

This table shows that the Communicators, in 2007, were available 1,446 hours out of the 1,947 hours they were scheduled to work (this does not include overtime). This is equivalent to a net availability of 75% - or conversely, that personnel are not available to work 25% of the time. This is a critical figure that goes directly to the

number of total fulltime equivalents required to staff a given 24-hour position in the PSCC, as shown, below:

Factor	Impact
Hours / Year for One Post	8,760.0
Net Availability	1,445.9
Positions Required to Cover	6.1

The next consideration is the level of deployment targeted in the Center itself. In this analysis the project team has not challenged the level of staffing – this only indicates how many personnel would be required to staff the various positions targeting minimal levels of overtime utilization:

**Dane County Emergency Communications Center
Staffing Required Using Current Positions**

Time	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
645	11	11	11	11	11	10	10
1045	13	13	13	13	13	11	11
1445	13	13	13	13	13	13	13
1845	13	13	13	13	13	13	13
2245	11	11	11	11	11	11	11
245	9	9	9	9	9	9	9

Time	Mon	Tue	Wed	Thurs	Fri	Sat	Sun	Total
645	44	44	44	44	44	40	40	300
1045	52	52	52	52	52	44	44	348
1445	52	52	52	52	52	52	52	364
1845	52	52	52	52	52	52	52	364
2245	44	44	44	44	44	44	44	308
245	36	36	36	36	36	36	36	252
Total	280	280	280	280	280	268	268	1,936
Total Year	14,610	14,610	14,610	14,610	14,610	13,984	13,984	101,018
Net Availability for Communicators								1,445.9
Comm's Required								69.9
Current Staffing								60
Variance								(9.86)

This analysis shows several key points, each of which are summarized, below:

- The staffing levels in the PSCC vary between nine (9) and 13 Communicators. A supervisor is also scheduled to work during all shifts.
- The staffing target varies by time of day and day of week to match various workload demands that occur in the Center.

- The project team then converted the staffing targets into hours of staffing required – each block representing four (4) hours.
- The total hours required under this approach exceeded 101,000 in the coming year (these targets are recently adopted and updated staffing targets for the Center that went into effect this fall).
- Converting these hours into the number of personnel required (dividing total hours by net availability) indicates that the Center requires 70 Communicators assigned to the dispatch floor (several others are assigned to support functions).

Recommendation: Under current conditions and given public policy decisions, the PSCC does not have sufficient personnel to staff without reliance on overtime. If the current deployment of personnel is maintained, the PSCC should be authorized 9 additional positions. This will not eliminate overtime but will significantly reduce it.

3. SEVERAL MODELS EXIST FOR ASSESSING STAFFING REQUIREMENTS IN THE PSCC.

The Matrix Consulting Group continually researches various methods for determining staffing requirements for functions such as emergency communications. There are several models currently worth consideration.

(1) APCO Project RETAINS Combines Workload and “Post” Positions in Determining Total Staffing Required.

In the last few years APCO has published a staffing model as part of their Project RETAINS efforts, developed by the University of Denver Research Institute. In effect, the APCO project RETAINS model requires several discreet data elements based on actual workloads to be effective. These include:

- Net annual staffing availability as discussed earlier in this chapter.
- Average telephone busy time (call duration in seconds), from phone records. This should ideally distinguish between law and fire E-9-1-1 calls and administrative calls for service.
- Average call completion time (in minutes, this includes time for keyboard data entry, radio transmission, address verification, etc.). Average call completion

time is often not accurately available. While some agencies are capable of collecting accurate radio transmission time, other dispatcher-related workload, such as records checks or keyboard data entry by staff, is most often not available.

- Average Processing Time, or APT— which is the sum of the two above bullets. What the APCO model fails to account for is the workload directly related to other activities unrelated to telephone call's workload; that is, by example, officer initiated activities and the variety of tasks associated thereto.
- Agent Occupancy Rate (AO) which reflects the proportion of time that the agency desires a dispatcher to be occupied with workload. This is, in effect the opposite of the prior model's Utilization Rate which calculates the proportion of time a dispatcher should be free of workload as opposed to busy with workload. Nevertheless, the concept is the same although the mathematics differs.
- The model also provides for positions which are staffed based on workload and positions staffed as "coverage" – i.e., positions that are staffed for public policy reasons other than workload.

In brief, the APCO project RETAINS staffing model is a generally good methodology with a few notable exceptions, but it is data intensive to the extent that many agencies do not possess the level of detail required to properly complete the model. The Matrix Consulting Group, using the APCO model as a baseline, has made some slight revisions using major work activities captured as well as some assumptions regarding other types of work.

(2) Erlang C Models Were Developed for Telephone Queuing Applications and Have Some Utility When Examining Dispatch Operations.

Another model that can be used to estimate staffing needs is based on the work of Danish engineer Agner Erlang. Unlike the prior two models which estimates staffing based upon community generated calls for service workload standards or actual work outputs for major tasks, the Erlang model uses workload variables but the primary driver is related to developing staffing levels based on desired performance or "response time." In effect, the Erlang Model is a predicted performance model that calculates the

probability of a certain average wait time that a caller would experience. One of the primary criticisms of the Erlang model is that it assumes an acceptable “on-hold” time for the caller. While initially this may seem to make the Erlang model impractical for use in an E-9-1-1 PSAP environment, using national or local policy-driven standards for call answering times eliminates the shortcoming of an assumed hold time. The Erlang model uses calculations to find the amount of time it takes to answer a call based on a certain level of staffing; these times can then be compared to standards to assure performance minimums are achieved. Although the Erlang model has been traditionally used to estimate staffing needs and performance predictions for non-emergency call center operations, the input values can be manipulated such that the model is well adaptable to a PSAP.

As it relates to standards, according to the National Emergency Number Association (NENA), PSAPs should meet or exceed the minimum standard of 90% of E9-1-1 calls answered within ten (10) seconds and 95% of E9-1-1 calls answered within twenty (20) seconds. Local and state standards may be different but these standards should be considered reasonable operating protocols. The Erlang model uses sophisticated formulae based on probability theory which will not be replicated in this report. The Matrix Consulting Group uses the Erlang model to determine the number of call takers required in the Center.

4. ANALYSIS OF STAFFING USING WORKLOAD AS THE SOLE DETERMINING FACTOR

The second analysis conducted by the project team focuses on determining the number of personnel required to handle call-taking and dispatching functions in the PSCC – based entirely on workload. In other words, this model does not protect current

assumptions about staffing fire and law enforcement with essentially equivalent staffing for a major part of each day. Nor does the model make any other assumptions about how personnel would be specifically deployed across the day or into which functions – other than broadly for call-taking and dispatching. The results of this model are provided, below:

Element	Value
CALL TAKING	
911 Call On-Phone Time ¹	3.60
Other Calls On-Phone Time ²	2.20
911 Calls (2008 Projected)	195,000.00
Non-911 Calls (2008 Projected)	495,000.00
Sub-Total: 911 Call Processing Time (Minutes)	702,000.00
Sub-Total Non-911 Call Processing Time (Minutes)	1,089,000.00
Total Phone Time (Minutes)	1,791,000.00
Utilization (Erlang-C)	50%
Total Time for Call Takers (Minutes)	3,582,000.00
Total Time for Call Takers (Hours)	59,700.00
Net Availability	1,445.90
Call Taking Staff Required	41.29
DISPATCHING	
Fire / EMS Radio Time (est.)	2.50
Police / Sheriff Radio Time (est.)	3.00
Fire / EMS Incidents (2008 projected)	30,953.00
Police / Sheriff Incidents (2008 projected)	244,532.00
Sub-Total: Fire / EMS Radio Time	77,382.50
Sub-Total: Police / Sheriff Radio Time	733,596.00
Total Radio Time	810,978.50
Utilization Target	50%
Total Time Required for Radio (Minutes)	1,621,957.00
Total Time Required for Radio (Hours)	27,032.62
Net Availability	1,445.90
Dispatcher Staff Required	18.70
SUMMARY	
Call Taking Staff Required	41.29
Dispatcher Staff Required	18.70
Total Staff Required (Volume)	59.99
Current Line Staffing	60.00
Variance	0.01

¹ Includes time for processing the call and for associated administrative tasks.

² See preceding note.

Note that this analysis suggests a similar level of additional personnel compared to the current staffing in the center. This model, based entirely on workload suggests that the Center would require a total 60 personnel – or the number that are currently authorized for the PSCC operations floor. However, a closer examination also shows the following:

- The number of dispatcher positions calls for 19 staff – this is equivalent to three (3) Communicators around the clock (remember that it takes approximately 6 positions to cover a 24-hour / 7-day position in the PSCC).
- The total number of call taker position required is 41 – this is equivalent to 8.5 call-taker Communicator positions on average. This is one more than is on-duty under average conditions at the present time.

The most significant impact of this would be that the model suggests that the Center could operate with one fewer dispatch console position staffed than is currently the case (there are two law enforcement and two fire / EMS consoles staffed at minimum at all times – plus the data channel / call-taker consoles). Reducing the number of dispatch positions from the current levels (four or five plus at least one data channel) to increase the number of call takers would be challenging – particularly for the fire / EMS providers. The next analysis takes into consideration the impact of maintaining the two fire / EMS consoles regardless of workload.

5. ANALYSIS OF STAFFING USING A BLEND OF WORKLOAD AND FIXED POSTS FOR CERTAIN POSITIONS SHOWS THAT EVEN WITH 10 ADDITIONAL PERSONNEL, OVERTIME WOULD STILL BE REQUIRED.

The APCO model and our adaptation of it allows for the use of both workload-derived staffing and for determining staff based on fixed posts – or coverage positions – to satisfy operational, political or other necessities. The model, that follows, provides the staffing assessment for the center under the following key assumptions:

- Call-taking positions will be determined in the model using volume-based (workload) approaches.
- Law enforcement dispatch positions will also be calculated based on the workload in the Center.
- Fire / EMS console positions will be determined in this model assuming that there must be two positions staffed regardless of the workload.

The following exhibit depicts the results of this model:

Element	Value
CALL TAKING	
911 Call On-Phone Time	3.60
Other Calls On-Phone Time	2.19
911 Calls (2008 Projected)	195,000.00
Non-911 Calls (2008 Projected)	495,000.00
Sub-Total: 911 Call Processing Time (Minutes)	702,000.00
Sub-Total Non-911 Call Processing Time (Minutes)	1,085,700.00
Total Phone Time (Minutes)	1,787,700.00
Utilization (Erlang-C)	50%
Total Time for Call Takers (Minutes)	3,575,400.00
Total Time for Call Takers (Hours)	59,590.00
Net Availability	1,445.90
Call Taking Staff Required	41.21
DISPATCHING	
Fire / EMS Radio Time (est.)	0
Police / Sheriff Radio Time (est.)	3
Fire / EMS Incidents (2008 projected)	30,953.00
Police / Sheriff Incidents (2008 projected)	244,532.00
Sub-Total: Fire / EMS Radio Time	0.00
Sub-Total: Police / Sheriff Radio Time	733,596.00
Total Radio Time	733,596.00
Utilization Target	50%
Total Time Required for Radio (Minutes)	1,467,192.00
Total Time Required for Radio (Hours)	24,453.20
Net Availability	1,445.90
Dispatcher Staff Required	16.91209627
SUMMARY	
Call Taking Staff Required	41.21
Fire / EMS Dispatcher Staff Required - POST	12.12
Police Dispatcher Staff Required - WORKLOAD	16.91
Total Staff Required (Volume)	70.24
Current Line Staffing	60
Variance	(10.24)

This model shows several interesting results:

- Fire / EMS dispatch console would require 12 positions (intuitive since the system was forced to staff two positions and current net availability levels mean that each 24-hour position requires six staff positions).
- Law enforcement dispatch requires 17 positions – almost enough to staff three positions around the clock. This is an interesting finding in that it matches quite well with the staffing approach currently used in the Center:
 - The Center staffs either two or three law enforcement consoles depending on the time of day and day of week.
 - The Center staffs two data channels consoles – however, these positions also function as call-taker overflow positions. This appears to result in their being least available when the Center is busiest (due to incoming phone volume).

Recommendation: The County of Dane should authorize a total of 10 new Communicator positions. These positions should be funded and authorized for hire as soon as practicable. The key public policy decision that must be made by the Center Board and the County (with input from its participating agencies) is whether these positions should be used to provide for maintaining the second fire / EMS console or whether the additional positions should be used to provide for an additional call-taker console in the near future.

6. THE SPACE NEEDS ASSESSMENT DEVELOPED FOR THE CENTER SHOWS THAT THE CURRENT FACILITY IS LARGE ENOUGH TO ACCOMMODATE A MODERN AND EXPANDED CENTER.

The Matrix Consulting Group was also asked, as part of Phase I, to examine the space needs of the Center both currently and in the foreseeable future. This Task was to be performed within the context of an on-going space needs assessment and renovation project for the existing Center space. The project team took the approach of comparing current space utilization with proposed space utilization. A key driver in dispatch center space requirements is the number of square feet required for each call-taker / dispatcher console. The space required for these units has significantly declined in recent years due to several factors:

- Computer monitors are now flat screens rather than cathode-ray style – they require significantly less physical space and correspondingly less space for cooling.
- Likewise, computers have become much smaller and require much less space on the floor and in the console furniture.
- These changes allow modules to be placed into configurations that were impractical in the recent past – including X shaped designs where four (4) Communicator consoles can be placed facing one another. No longer to the consoles require access to rear panels due to the size and configuration of computer and network equipment.

The resulting space needs assessment is provided, below:

Position	Current Sq. Ft	Recommended Space Standard	Office / Room	Modular	Console
Director	260	225	x		
Operations Manager	216	180	x		
Support Service Manager	120	180	x		
Clerk 3 / Lobby	250	180		x	
Clerk 4	200	140	x		
Data Base Coordinator	117	140		x	
Communications Supervisor - Support	180	140		x	
Supervisors Office - Ops	216	140	x		
Communicator – Support Serv. QA	180	120		x	
Communicator – Support Serv. Schedule	117	120			
LTE	180	70			
Operations Room - Supervisor - Call Taker - Communicator	3000** 13 Positions	3000** 21 Positions			x
Conference / Training Room	340	340	x		
Hallway 1 st Flr	518	518			
Hallway 2 nd Flr	45	45			
Break room	352	350	x		
Women's Locker/Restroom	200	250	x		
Men's Locker/Restroom	200	250	x		
Gallery (Office in Ops Room)	192	200	x		
Janitor Closet	60	60	x		
Telephone room	210	250	x		
Computer room	413	425	x		
Office Supply / Records Storage	252	250	x		

Position	Current Sq. Ft	Recommended Space Standard	Office / Room	Modular	Console
Central Electronics Bank	288	300	x		
Mechanical Room	420	420	x		
Electrical/Storage/City Fiber Room	150	150	x		
Future FTE	0	160	X		
Future FTE	0	160	X		
Future FTE	0	160	X		
USED SQ FOOTAGE	8,676	8,923			
UN-USEABLE	413	-413	8,150		
TOTAL SQ FOOTAGE	9,089	9,336			

*Includes circulation **Fixed

The following provide the project team's key findings and recommendations:

- The project team has provided for several support / administrative functions that are not currently located in or authorized for the Center for future growth capacity. These include the Database Coordinator and others.
- Office sizes are based on current utilization (where there are hard walls) or on space standards from the several public safety architectural studies.
- Circulation space is built into all standards.
- Existing restrooms where maintained.
- The proposed allocation of space can fit into the existing allotment provided to the PSCC. It should be recalled that the current space is divided as follows:
 - 8,150 square feet of existing space is on the 1st floor of the City / County building in the existing PSCC area.
 - An additional 939 square feet is available for support functions and is located on the third floor of the City / County building. While the separation presents some challenges for the Center and its personnel these challenges are not overly problematic.

The project team reviewed the recommendations from the County's architect / engineers for the space and find that they concur in principal that the existing space can be well utilized for an improved PSCC facility without requiring additional space.

Further, the current space can accommodate an increase to 21 consoles – up from the current 13 positions found on the dispatch floor.

Recommendation: The renovation project for the PSCC should continue to move forward using the existing footprint of the Center. The floor space available on the 1st and 3rd floors of the City / County Building is adequate for current and expanded operations.