Solution for the CMPD Problem Solving System

A Proposal from Lyon Technologies, Inc.

May 26, 2004

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Request for Proposals
Attention: Marcy Mars, Procurement Services Division
CMPD Problem Solving System
RFP # 2004-099

Dear Ms. Mars:

Lyon Technologies, Inc. is pleased to present our response to Request for Proposal # 2004-099, CMPD Problem Solving System. This proposal was prepared according to the requirements specified in the RFP from the City of Charlotte.

For contractural obligations, negotiations, and any other questions regarding this proposal, please use the following contact information:

Name:	Stephanie Lyon
Title:	President, Lyon Technologies, Inc.
Telephone:	919-784-0440
Facsimile:	919-784-0451
E-mail:	Lyon@LyonTechnologies.com

The contact information above is to be used to reach the Service Provider and the executive that has the authority to contract with the City—they are one and the same. Lyon Technologies, Inc. is a Raleigh, North Carolina based woman veteran owned provider of information technology services to major organizations throughout the region, including Progress Energy, Blue Cross/Blue Shield of North Carolina, and Data Direct Technologies, Inc. (formerly Intersolv).

It is our understanding that the CMPD has developed a technology-based system to support community oriented policing and problem solving. An initial interim prototype solution was developed last year and is currently in production use. It is the desire of the CMPD that this prototype be rewritten and enhanced to fully meet CMPD operational needs, as well as provide a facility for the community to engage in problem reporting and resolutions.

Lyon Technologies will develop and deliver the revised application with the highest quality of customer support, project management and software engineering practices. Unlike other technology consulting companies, we strive to develop solutions that our clients can use and maintain independently, rather than foster a dependent relationship for monetary gain.

Regarding the overall costs of our development for this project, we have provided several different options for CMPD. These options are detailed in full in the *Supplemental Information* subsection of the *Proposed Solution* section of this document. The general timeframe for completing this project is approximately 4-6 months, with an average cost of [redacted].

We are eager to assist you with the CMPD Problem Solving System upgrade, and we're looking forward to forging a strong business partnership between our firm and the CMPD.

The information contained in this Proposal or any part thereof, including its Exhibits, Schedules, and other documents and instruments delivered or to be delivered to the City, is true, accurate, and complete. This Proposal includes all information necessary to ensure that the statements therein do not in whole or in part mislead the City as to any material facts.

Sincerely,

Stephanie Lyon
President, Lyon Technologies, Inc.

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Executive Summary

Summary of Proposed Services

Overview

In keeping with the requirements that the CMPD has outlined for this project, Lyon Technologies will deliver the following services:

- Rework the existing CMPD application using the .NET framework
- Enhance current application functionality, as requested
- Deliver the application on time to the CMPD's exact specifications
- Manage the transition, conversion and deployment of the revised application
- Support the CMPD personnel and application as long as necessary until your organization is self sufficient

Highlights about Lyon Technologies, Inc.

Lyon Technologies, Inc. is a local North Carolina technology firm with previous .NET application development experience. We keep our core base of employees small and contract other professionals as needed in order to maintain a high-quality, customer-focused operation with a commitment to customer service.

Our owner, Project Manager and Programmer, Stephanie Lyon, has delivered presentations at several international conferences. Our Programmer, Don Strong, has received numerous commendations from his previous clients. Our Technical Writer and User Interface Specialist, Ceil Hall, has received six awards for her online design and documentation and has presented her work at an international conference of the Society for Technical Communication. All three of these professionals have more than 15 years of experience, and they have worked together previously on behalf of Lyon Technologies' other clients.

The professionals at Lyon Technologies have analyzed the RFP for the CMPD Problem Solving System very carefully. In addition to responding directly to the requirements in the RFP, we have identified a small number of additional requirements that we believe will significantly enhance the CMPD's ability to achieve their goals. These additions are explained in the *Supplemental Information* subsection of the *Proposed Solution* section of this document.

Project Team Responsibilities

For the CMPD Problem Solving System project, the project team members from Lyon Technologies will be composed of one Project Manager/Programmer, two Programmers, one QA Resource, and one Technical Writer/User Interface Specialist. Their responsibilities will be as follows:

Ms. Stephanie Lyon, who has served as an accomplished project manager, programmer, and trainer for a wide variety of technological systems for 15 years, will provide assistance as Project Manager and Programmer. She will be responsible for ensuring that the project is completed successfully, on time and within budget. Her tasks will include (but are not limited to) the following:

- Work with CMPD personnel to develop a detailed project plan
- Assign resources and deliverable timeframes to the various tasks
- Conduct regular reviews of the project status and report the status to CMPD personnel
- Guide the development process and keep it moving forward, ensuring that every team member has what he needs to complete his tasks as scheduled
- Provide technical programming expertise to support the other programmers on the team

Mr. Donald Strong, a programmer with nearly 20 years of solid, diverse experience in programming and application support, will do the following:

- Develop and design application code per specifications
- Analyze technical specifications to build database objects such as stored procedures and triggers as needed
- Define methods and properties for application COM objects
- Build validation rules
- Implement the user interface
- Perform initial unit testing
- Collaborate with the QA Resource to extensively test screen and application functionality
- Investigate and resolve software defects

Lyon Technologies is currently in the process of hiring another programmer. This employee will have the same responsibilities on the CMPD project as Mr. Donald Strong. The professional we hire will have, at the minimum, the following qualifications:

- Experience with .NET Framework
- HTML, Javascript and ASP

- 3-5 years programming experience
- Fluency in Oracle database functionality, ODBC, and PL/SQL
- Knowledge of object oriented design principles, including COM
- Ability to understand requirement specifications, data models, and use cases
- Expertise in analyzing technical specifications to design and build database objects such as stored procedures, triggers, and database scripts

The QA Analyst that Lyon Technologies will contract for this project will be responsible for the following tasks:

- Develop, implement and maintain quality assurance procedures, projects and test plans
- Integrate QA tasks into the overall product development life cycle
- Collaborate with CMPD personnel to prepare detailed design specifications
- Develop and execute use cases and test plans for the project
- Coordinate with other team members to ensure that the developed software meets design specifications and that LTI customer satisfaction objectives are met

The professional that we contract will have at the minimum the following qualifications:

- Knowledge of SQL, relational databases, and automated testing tools
- 3 years of related experience
- Ability to develop test plans
- Ability to meet deadlines.

Ms. Ceil Hall, an award-winning 15-year veteran of the technical writing profession, will create all the application documents requested in the RFP, working closely with the team programmers and designated CMPD users to impart all necessary details for the installation, setup, maintenance, and use of the new system. Ms. Hall will also consult with the developers on the project regarding usable interface design elements such as navigational signposts, tool tips, tab order, and so forth.

General Management Philosophy

At Lyon Technologies, we believe in delivering products of exceptional quality, designed and implemented to our clients' precise specifications.

To achieve this level of performance, we are extremely selective in our choice of employees. We only hire employees that strive for excellence, keep their skills up to date, and put our clients first.

We are also extremely selective about the projects on which we choose to bid. We turn down projects that are too large for our pool of resources or that do not match our skill sets. We also do not bid on projects if the prospective client has not provided specifications or allocated sufficient resources to the project, such as equipment, human resources, or time.

Our reason for this is that we would rather not attempt a project at all if the chance exists that the client will be unhappy with the results. We only pick projects that we know we can complete successfully and that will bring satisfaction to our clients.

As a result, we receive unsolicited expressions of gratitude for our work from our clients on a regular basis. In an age that places diminishing emphasis on customer service, we pride ourselves on delivering top quality products and impeccable customer service to all our clients.

At Lyon Technologies, our general philosophy regarding the management of our employees, projects, and relationships with clients can be summed up in one phrase: Our clients' success is our success. That is our top priority, and that is what guides and drives everything we do at our firm.

Background and Experience

Official Name

Company Name and Address

Lyon Technologies, Inc.
3405 Savan Court
Raleigh, NC 27613
919-784-0440
State of Incorporation: NC
Type of Corporation: C

Joint Venture Partners

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Raleigh, NC 27601
Bill Dunn, President
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847-673-0900

Subcontractors

Zig Custom Software
P.O. Box 99586
Raleigh, NC 27624-9586
Jeff Turner, Partner
Jturner@zig.com
919-345-5298

Company Description and Background

Lyon Technologies, Inc., is a provider of information technology services, based in Raleigh, North Carolina. Although this is our first opportunity to serve a government organization, we have ongoing relationships with Progress Energy, Blue Cross Blue Shield, and other major organizations throughout the region.

We specialize in the development of business intelligence solutions, from web-based application development to dashboards, scorecards, and reports.

Our primary focus is to improve decision-making, productivity, and cost-effectiveness by combining technology and business processes to retrieve, use, and share information. Our solutions have been instrumental in supporting

competitive organizational initiatives, such as corporate time management, customer relationship management, and the identification of areas where businesses can effectively reduce costs.

In summary, we provide a competitive advantage to our clients by generating a more solid basis for making decisions that affect business performance.

Lyon Technologies is committed to delivering quality. We pride ourselves on collaborating with our clients to help them make sense of the thousands of lines of data that have accumulated in their databases.

Lyon Technologies, Inc., was founded in 2000 by Stephanie Lyon. While working for several other information technology firms, Ms. Lyon was repeatedly exposed to customer dissatisfaction and frustration with the majority of available consulting firms. Knowing that this was not necessary, she set out to prove that a technology firm could exist whose first priority was its customer's success. For a concise statement of our customer service philosophy, see the *Business Partners/Customer Service Philosophy* section below.

We offer a wide range of expertise while providing the highest level of service and commitment. Most important, we give you the close attention you deserve. Our personnel members have many years of experience in application development, deployment and support. Database expertise, technology training, report development, web site /portal construction, training, documentation, help desk services, domestic/international services—we've done it all.

As shown in the *Organization and Ownership* section below, our company chooses to retain only a few core employees. However, the enthusiastic testimonials and letters of appreciation sent to us by BGF and Data Direct Technologies demonstrate the time-honored wisdom that bigger is not always better. Our size is an asset to our customers: unlike large companies, we have the flexibility and responsiveness to respond to your needs. There are no layers of management to impede communication—you have only one point of contact, one telephone number to call.

Organization and Ownership

Full Name:	Lyon Technologies, Inc.
Federal Tax Id:	56-2216125
Date Established:	July 2000
Ownership:	Private Company
Incorporation:	North Carolina, based in Raleigh

Employees: 2000: 1
2001: 2
2002: 2
2003: 3
2004: 3

Note: Employee numbers are approximate, as staff is augmented based on project and client requirements.

Experience with Similar Business Plan Development Projects

The employees of Lyon Technologies each have a minimum of 15 years in the Information Technology industry. We have all worked on many development projects, written thousands of lines of code, and formed successful partnerships with many clients. We've also designed numerous web sites, including graphics, for our clients. Our technical writer, Ceil Hall, has won several online documentation awards and has completed projects for two government organizations: the North Carolina Department of Transportation and the United States Postal Service.

Out of all the projects that Lyon Technologies has completed to date, the project for Data Direct Technologies is the most similar to the one in the CMPD Problem Solving System RFP. Therefore, we are focusing our description of previous similar experience on that particular case study. Information about this project is as follows:

Application: Maintenance Fee Renewal System
Technology: ASP.NET, Web-based, Crystal Reports
Interfaces: Peoplesoft ERP and CRM
Time Frame to Develop: 4 Months
Time in Production: 1 Year

The Maintenance Fee Renewal System is a web-based application currently in production use at Data Direct Technologies in Morrisville, NC. The application is written in ASP.NET.

Data Direct Technologies produces and sells database software. The MFR Renewal System facilitates and streamlines the process of selling technical support renewal contracts by enabling the Data Direct sales staff to display and manage upcoming renewal records. The MFR Renewal System assists the natural workflow of renewing contracts by helping the sales staff track and edit information such as customer contact data, support renewal dates, renewal statuses, and product renewal prices.

The application also generates quotes and expiration notices on demand in PDF format. The content of these documents is taken directly from the data that the sales staff manages in the application.

A reporting component of the MFR Renewal System enables the users to view and print lists of all open records by customer name or status, providing details that they can use to conduct searches for specific customers in their territory.

An administrative module of the application enables IT staff to copy renewal records within a specified date range from the Peoplesoft database to the MFR Renewal database at any time, as well as allowing IT Staff to update lookup tables.

The level of customer satisfaction on this project was and still is very high. Data Direct wrote an unsolicited letter of appreciation to Lyon Technologies for our work on this project, which stated the following:

> "…the work performed by Lyon Technologies was very professional, technically competent, and always timely. The design work was well documented, satisfied all of the business objectives, and provided a solid foundation for the project.
>
> "Development…was completed on schedule and included all of the functional requirements and controls expected. Deployment, which included testing, training, and documentation, was a complete success and was enthusiastically received by the users. Post-production support was timely and very responsive."

Confidentiality

This proposal contains no confidential proprietary information as defined by Chapter 66-152 et. seq. of the General Statutes of North Carolina.

Business Partners

Customer Service Philosophy

Since its inception, Lyon Technologies has collected an extensive list of clients that return to our company repeatedly for advice, solutions, and satisfaction. This has been a natural outcome of Lyon Technologies' approach to customer service.

Our company operates on two very simple philosophies—1) the quality of support, the friendliness and responsiveness of the representatives, the flexibility of service, the ease of communication—all this and more are part of the customer's experience; and 2) "good enough" is *not* enough.

At Lyon Technologies, we never lose sight of these simple truths. We understand that offering a quality product or service at a competitive price is just the beginning of our relationship with our clients. In the long run, it is the quality of our support and communication that creates a harmonious, enduring partnership between our business partners and our firm.

We reinforce this philosophy via our Key Performance Indicator program. For details about this program, see the *Continuous Improvement Program* section below.

Total Quality Management Approach and Plan

The paragraphs below explain Lyon Technologies' official corporate policy regarding the total quality management approach and plan for all software development projects. All employees of Lyon Technologies are *required* to comply with this policy throughout their tenure at our company.

Lyon Technologies, Inc., Software Development Policies

The following policies cover software created and acquired by or for Lyon Technologies, Inc., and also cover all commercial off-the-shelf (COTS) software included in a Lyon Technologies-developed system.

These policies shall be applied as appropriate, consistent with sound engineering and risk management practices as determined by cost, size, complexity, life span, risk, and consequences of failure. Lyon Technologies, Inc.'s policy regarding software management, engineering, and assurance is to accomplish the following:

a) Manage, engineer, and assure software in accordance with common industry standards and best practices; document the use of standards, processes, and best practices in accordance with IEEE; and tailor standards, processes, and best practices to the development or acquisition.

b) Implement and integrate software engineering processes and practices with other system development and project processes and practices. Develop a plan for life cycle management of the software as part of the project plan. This plan should be developed prior to any software development work and should address design tradeoff management, risk management, requirements management, software project tracking and oversight, subcontract management, and quality assurance.

c) Develop and maintain a total estimated software life cycle cost and, where appropriate, perform tradeoff studies that address the use of COTS software versus created software to satisfy requirements before software is created or acquired. *The client's best interest will always be of primary importance.*

d) Demonstrate that any external staff or provider of software to be developed has the proven organizational capabilities and experience to deliver quality software on time and within budget. Require acceptable evidence of the

individual's software management, engineering, and assurance standards, processes, and practices to produce quality software.

e) All project managers will be responsible for developing a detailed project plan to manage software development throughout the project life cycle once the software requirements specification is complete and *before* any software design and coding takes place. The plan shall address items required in Section b above.

f) All project managers will strive to identify, analyze, plan, track, control, and communicate risks at each stage of the project life cycle and notify the client accordingly.

Continuous Improvement Program

Overview

At Lyon Technologies we promote the conviction that, no matter how creative, proficient and responsive we are today, we can always improve. One of our primary philosophies is that "good enough never is." This belief promotes a collective attitude of innovation, ingenuity and inspiration.

In keeping with this philosophy, Lyon Technologies is committed to a formal continuous improvement program that utilizes a set of Key Performance Indicators (KPIs). We discuss the KPIs with all our employees and then measure each one a quarterly basis to determine the degree to which we have reached each target goal.

These KPIs give everyone in our organization a clear picture of our company priorities, as well as what we expect our employees to do to attain our common goals.

Specific Examples of KPIs at Lyon Technologies

1) ***Customer Return Percentage***

Concept: One of the goals of Lyon Technologies is to have such a high degree of customer satisfaction that our clients return to us for consultation and solutions over and over again. Ultimately, the greatest measure of our success is whether or not a client engages our services again.

Definition: In cases where there has been more than one opportunity to bid on projects, the total number of the opportunities known for a client divided by the number of times that Lyon Technologies was invited to bid on them. For example, if Lyon Technologies completes one project for a given client and then bids on another one for the same client, the Customer Return Percentage would be 1/2 * 100 = 50%.

Target: 80%

2) ***Employee Growth***

Concept: We operate in a world in which the pace of change accelerates continuously. This requires that we strive to increase productivity and quality at all times. To meet this requirement we must build the capacity of our team continuously in order to meet both immediate and future demands in our industry. Therefore, Lyon Technologies has identified Employee Growth as one of our most important KPIs. All our employees are required to attend a minimum of one training class each year; two classes are preferred.

Definition: The total number of training classes attended by each employee in our firm divided by the total number of employees. For example, if all personnel members attend one training class per year, the rate would be 100%.

Target: 100%

3) ***Customer Problem Resolution Time***

Concept: The amount of time that it takes Lyon Technologies to resolve our clients' problems is absolutely critical to their success; and our clients' success is our top priority. Our solutions exist to streamline our clients' operations, increase productivity, and reduce costs; and any problem that they experience must be resolved promptly in order to maintain those goals and ensure their success.

Definition: The average time between a client's notification of a problem and the resolution of the problem.

Target: High Priority Problem: 30 Minutes; Medium Priority Problem: 1 Hour; Low Priority Problem: 4 Hours

4) ***Customer Perception of Problem Resolution Time***

Concept: This indicator measures how well each client perceives us to resolve a problem in a timely manner. At Lyon Technologies our position is that each client's perception of our response time is more important than what actually occurs. Successful outcomes between our clients and our team members are dependent on a harmonious relationship; and to that end, we place our clients' perceptions of our responsiveness first.

Definition: The average time between a client's notification of a problem and the resolution of the problem from the customer's perspective.

Target: High Priority Problem: 30 Minutes; Medium Priority Problem: 1 Hour; Low Priority Problem: 4 Hours

Customer Benefits Resulting from our Continuous Improvement Program

By adhering to our KPI system of professional improvement, Lyon Technologies ensures the highest quality of deliverables, as well as maximum customer service and technical support. This has been reflected in our clients' unsolicited praise. For examples of this, see the attached letters at the end of this proposal.

Lyon Technologies has received comments from our clients that we "fixed problems that other firms said could not be fixed." We were able to do that because we "think outside the box" and go beyond the ordinary suspects. Our extensive experience in IT has enabled each one of our staff members to grasp the notion that "the location in which the ceiling collapses is not necessarily the same location as the leaky roof." In fact, water may not even be the cause.

Experiences Adapting to Changing Technologies

IT professionals can never rest on their laurels. In fact, just the opposite is true—the technology world is moving and changing faster each day, and those who do not keep abreast of the changes get left behind.

At Lyon Technologies, we pride ourselves on keeping up with the latest skills and technologies in our industry.

An excellent example of this is our experience with the new technology from Microsoft, .NET. The .NET product was in beta two years ago (specifically, September 2002), and it moved into its first release phase only last July (2003). Just after the beta version of .NET was released, Lyon Technologies had just begun drafting a specification for a web-based solution for Data Direct Technologies. The client expressed a desire to use the cutting edge of web development in their new software, and we recommended .NET.

Data Direct Technologies agreed with our recommendation, and even though the product was still in the beta phase of development, the professionals at Lyon Technologies had 80% of the knowledge base for it already because we had already learned Visual Basic and Internet technologies. We delivered their application to them on time, even before .NET went into production. In doing so, we became one of the region's first consulting firms to have completed and deployed a .NET software product, which has been in production at Data Direct Technologies for more than a year.

Our success with this and other projects that involved new emerging technologies is a result of our commitment to ongoing employee training, an integral part of our continuous improvement program, which is described in the section above.

References

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Donald Strong

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Mike Young
(919) 523-7439
michaelwyoung@hotmail.com
Relationship: Fellow Employee

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Claudette Anderson
(919) 844-0440
claudette@triangleliving.com
Relationship: Customer

New Programmer

Lyon Technologies will provide the new programmer's references as soon as we hire this professional.

QA Resource

Lyon Technologies will provide the QA Resource's references as soon as we contract this professional for the project.

Ceil Hall

Eliassen Consulting Group, Inc.
30 Audubon Road
Wakefield, MA 01880
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919-349-7987 (Raleigh phone number; local-site office in Raleigh, NC)
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Relationship: Contract Employer

Proposed Solution

Preliminary Project Plan

Modifications to the Current Screen Design

Overview

The usability of an application's design is not just a philosophical; it is essential to the success of the application. The investment in the design of an application is directly related to the user's satisfaction. Effective visual design is vital.

Lyon Technologies will redesign screens for the system using common best practices for web interfaces. Our personnel are skilled in interface design and usability. In addition to providing the functionality that CMPD requires, we will design screens that are intuitive and easy for CMPD personnel to use.

For example, one of the key success factors of any web interface design is its ability to provide navigational and organizational "signposts" for the users. They need to know where they are in the system at all times, as well as how they can get to where they want to go.

Also, usability studies have shown that users have difficulty reading and retaining information on pages that require extensive scrolling, or they may not see content that is located outside the current view. Therefore, the screen designs that Lyon Technologies will create for CMPD will require minimal scrolling by the user. We will design according to the standards set by the World Wide Web consortium for accessibility of web content.

Our technical writer, Ceil Hall, has won numerous awards in online documentation from the Society for Technical Communication for creating designs that are simple to navigate and comprehend. We will rely heavily on her expertise in usability and design as we modify CMPD's current screen design.

Methodology

After consulting the Requirements Specification document provided by CMPD, our team members will analyze the existing screen layout and navigation and make a list of suggestions for redesigning the screens. We will then collaborate with CMPD personnel to determine the optimal revisions to be made.

During this process, we will determine the following:

- Business rules that govern each screen.
- Required fields.

- Any error messages that should appear.
- Links to related pages.

After conducting this proactive review, we will begin coding the new screens. While this coding takes place, the Quality Assurance professional that we contract will work with CMPD personnel to define several test scenarios. These test scenarios will be used during the unit, system, and user acceptance tests.

Specific Recommendations

Upon first perusal of CMPD's current prototype screens, Lyon Technologies recommends a more effective use of color. We have noticed the existence of dark text on a black background, and we plan to redesign these elements so that the pages in the CMPD Problem Solving System are clearer and easier to read.

We also recommend that CMPD consider adding pagination to the search results screens, rather than placing all the search results on one long page that requires scrolling. This will make it much easier for users to navigate through search results. Fortunately, Lyon Technologies has already written a .NET application that paginates search results screens; the code to implement this solution is already available to our clients. Therefore, we can add this function to the CMPD Problem Solving System free of charge.

Specific Tasks Associated with Modifying the Current Screens

The tasks and the resources involved in redesigning the existing screens for the CMPD Problem Solving System are detailed in the table below.

TASK TO BE PERFORMED	RESOURCES REQUIRED
Identify and document business rules governing screen (control dependencies, required fields, messages to user, etc.).	LTI Project Manager, CMPD Personnel
Determine interface design changes.	LTI Interface Specialist
Determine any new fields required.	LTI Programmer
Make changes to data model as needed.	LTI Programmer
If data model changes require conversion/movement of data to a different data structure, document for use in conversion of production records.	LTI Programmer
Determine tool tips, tab order desired for data entry, and online help.	LTI Technical Writer
Code screen.	LTI Programmer
Develop test scenario, results and script.	LTI QA Resource

TASK TO BE PERFORMED	RESOURCES REQUIRED
Approve test scenario, results and script.	CMPD Personnel
Unit test screen.	LTI QA Resource
Document unit test results.	LTI QA Resource
Write User Manual.	LTI Technical Writer, CMPD Personnel
Document required information included in Interface Guide.	LTI Technical Writer

Workflow Modifications

Overview

In order to support several of the new requirements for the application, there will be some modifications made to the workflow. Specifically, the application will send e-mail to the CMPD e-mail server as certain events occur within the application.

The events that will cause this notification are as follows:

- An alert to assigned users after a new problem has been created
- An alert to assigned users when a problem has been approved
- An alert to the assigned "Lead" participant when a problem has been rejected

Specific Tasks Associated with Modifying the Workflow

The tasks and the resources involved in modifying the workflow for the CMPD Problem Solving System are detailed in the table below.

TASK TO BE PERFORMED	RESOURCES REQUIRED
Write code snippet to send e-mail to CMPD e-mail server.	LTI Programmer
Determine text and information to be sent in the e-mail for each notification event.	LTI Programmer
Edit the code in each screen where the applicable alert needs to be called.	LTI Programmer
Develop test scenario, results and script.	LTI QA Resource
Approve test scenario, results and script.	CMPD Personnel
Unit test e-mail functionality.	LTI QA Resource
Document unit test results.	LTI QA Resource

New Functionality Requirements (Excluding the Community Interface)

The subsections directly below provide an overview of the new functionality required for the Problem Solving System, as well as a brief summary of how Lyon Technologies will implement each one.

Supervisor Approval

Lyon Technologies will add support for supervisory approval to the application by creating a Supervisor Review & Comments screen. The screen will allow the Supervisor to approve or reject a problem, as well as enter comments. The screen will only be visible to users who have been defined as the Supervisor or Lead Participant on a problem, and only the individual who is identified as the Supervisor for the problem will be able to update it.

Lookup Maintenance

There are many lookup tables in the system. Lyon Technologies will develop a new Administrative screen that includes functionality for directly editing the data in each lookup table. As specified in the CMPD Problem Solving System RFP, the Lookup_Last_Update table will be updated every time a lookup table is edited.

Administrative Access Level

A security layer will be added to the application to support the desired grants and restrictions on functions within the system. Lyon Technologies will develop an additional screen that can be used to assign access privileges and security profiles to each user.

Problem Time Tracking

Users of the system will be able to record and track the amount of time spent on problem solving activities via an additional screen. The screen will allow a user or individual contributor to associate time with a particular problem. Within that problem, the time may *optionally* be associated with a task, tactic, or long-term objective that is identified with the problem.

View of Warehoused CAD Data

A screen will be developed that will allow a search on records in the CAD system. The search will return records that match a specific street address that the user enters. Up to 1 year's worth of data from the current date will be returned. The screen will enable the user to separate the search results set into 3-month, 6-month and 1-year groupings.

Audit Tracking

As specified in the CMPD Problem Solving System RFP, the Lookup_Last_Update table will be updated every time a lookup table is edited.

A database log function will be created to track all administrator edits on problems

A database log function will be created to track each change of a problem status.

New Fields and Forms Needed to Support New Functionality

The following additional screens are required in the new CMPD Problem Solving System:

Admin Screen

The admin screen will address the following new functionality items:

- User Access Level (also known as Security Setup)
- Lookup Maintenance Function
- The ability to call the CAD Interface Load Function

The Supervisor Approval and Administrative level access functions will be implemented via a security module that will define specific user types and their access levels. The following three user type security levels will be created:

- Administrator
- Supervisor
- Officer

Any user defined as an **Officer** will have the following access privileges:

- Ability to enter new problems
- Ability to edit any problems for which they are the Lead, the Supervisor, or a Participant
- Ability to view only problems for which they are not the Lead, the Supervisor, or a Participant

Any user defined as a **Supervisor** will have the following access privileges:

- All the access privileges that have been assigned to the Officer user type
- Ability to “approve” a problem

Any user defined as an **Administrator** will have the following access privileges:

- Ability to view/edit any problem with a status of open/pending/rejected/approved/deleted
- Ability to delete any problems with a status of open/pending/rejected/approved
- Ability to perform maintenance on lookup tables through the Lookup Maintenance Screen
- Ability to perform report management privileges, including the following: designing and publishing reports; deleting existing reports; modifying existing reports; creating custom reports

Lookup Maintenance: For each lookup table, there will be a corresponding administrative function that allows a CMPD staff member to edit the contents of the lookup (Add, Edit, Delete). This function will be accessed from the Administrative screen, as well.

CAD Interface Load: The Administrative screen will also contain the "kickoff" for the procedure to execute the load process from the Computer Aided Dispatch system to this system. The data retrieved can be accessed through the CAD Data View screen (described in the section directly below).

CAD Data View Screen

This screen will provide a summary view of prior service calls at a given location. The data will come from the tables that are loaded periodically from the CAD system.

Time Tracking Screen

This screen will allow users and individual contributors to record and track the amount of time spent on problem solving activities.

The following additional fields are required in the new CMPD Problem Solving System to support the time tracking functionality desired by CMPD:

- Begin DateTime
- End DateTime
- Task/Tactic/Long Term Objective for which the work was done
- Notes field to describe any notes about the time spent on the task
- Additional fields may be added as requested.

Specific Recommendations

According to the RFP, the CMPD Problem Solving System will include the following specification:

When an Officer initially logs on to the application, he or she will see the following items:

- The current user's name
- A list of open problems
- A list of problems that are closed pending a supervisor's approval
- A list of closed problems

Lyon Technologies recommends the following additional enhancements to this specification:

- **User Preference Screen:** Ability for a user to select what items should appear on their Home Page start up screen. For example, an Officer may want to see the list of Open Problems; a Supervisor may want to see a list of all Problems pending approval.
- **Video Storage:** This screen would allow the Officer to assign links to video files stored on the CMPD network to the Problem and then view selected video files through the interface.

Specific Tasks Associated with Designing New Fields and Forms

The tasks and the resources involved in designing new fields and forms for the CMPD Problem Solving System are detailed in the table below.

TASK TO BE PERFORMED	RESOURCES REQUIRED
Identify where screen is called from within application.	LTI Project Manager, CMPD Personnel
Identify and document business rules governing screen (control dependencies, required fields, messages to user, etc.).	LTI Project Manager, CMPD Personnel
Determine interface design.	LTI Interface Specialist
Determine desired data fields.	LTI Programmer
Make changes to data model as needed.	LTI Programmer
Determine tool tips, tab order desired for data entry, and online help.	LTI Technical Writer
Code screen.	LTI Programmer
Develop test scenario, results and script.	LTI QA Resource
Approve test scenario, results and script.	CMPD Personnel

TASK TO BE PERFORMED	RESOURCES REQUIRED
Unit test screen.	LTI QA Resource
Document unit test results.	LTI QA Resource
Write User Manual.	LTI Technical Writer, CMPD Personnel
Document required information included in Interface Guide.	LTI Technical Writer

Design of the Community Interface

Overview

The goal of the community awareness and involvement aspect of the CMPD Problem Solving System is to improve communication between the community and CMPD and to empower the community to help solve community problems. Lyon Technologies will assist CMPD in achieving this goal by leveraging our experience in user interface design. By designing a simple, attractive web interface that is easy to navigate and use, Lyon Technologies will maximize community participation in the system.

Although the Community Interface will, for the most part, reference the same data tables as the internal CMPD forms, Lyon Technologies can give the Community Interface a more "public face" than the interface that is used internally, if desired. It is essential that sufficient attention be focused on the design and usability of the public component because the extent to which the community participates in the CMPD Problem Solving System will be directly related to the Community Interface's aesthetic quality and ease of use. Our staff members have years of experience and have won numerous awards for online design and usability; we have the expertise necessary to create an easy and rewarding online experience for the members of your community.

New Forms Required To Support Desired Functionality

Lyon Technologies has identified the following forms that must be developed in order to support CMPD's community initiative:

- Home/Introductory page for the Community Interface
- Form that enables the public to identify a problem and enter it into the system
- Form that enables the public to search problems in the database, based on specific criteria
- Form that displays the results of a search
- Form that displays the Problem Detail information

Note: All forms will only display information that has been approved for public view.

Specific Recommendations

In the specifications set forth in RFP # 2004-099, the database portion of the Community Interface would be implemented as follows:

A distinct set of tables will be used for the Community Interface than the tables that are used internally. A script will be built and called from the Administrative screen that will periodically load data that has been approved for public release into the Community Interface tables.

Although this approach gives the appearance of providing additional security for the internal database, this is not necessarily the case. Also, this approach has the following disadvantages: 1) the data in the Community Interface tables will not always be up-to-date; and 2) additional storage space will be required in the database to hold both sets of tables.

Lyon Technologies can implement this solution for CMPD, if desired. However, we recommend the following alternate approach to the Community Interface database:

The internal interface and the Community Interface will use the same set of tables. The forms within the interface will contain security that controls what information the public can view and what they cannot view. Additional fields can be added to the data model to determine whether or not information is appropriate for public release. The value of these fields will be checked accordingly within the web site code so that only the data that has been approved for public viewing will be displayed.

The advantages to this approach are that 1) the data accessed by the public will always be up-to-date—it will always be identical to the data used internally; and 2) there is no need for duplication of data; therefore no additional storage space is necessary. There is also a disadvantage to this approach, in that the field containing the indicator for public vs. private viewing of data is a crucial part of the system. Although this field can be set when a problem is being edited, an additional workflow step will probably be necessary to enable a Supervisor or similar personnel member at CMPD to review the data that has been flagged for release to the public.

Specific Tasks Associated with Developing the Community Interface

Regardless of which approach to the Community Interface database is chosen, the forms identified in the previous section, *New Forms Required To Support Desired Functionality*, remain the same. The tasks and resources involved in designing the Community Interface are detailed in the table below.

For each form in the system, the following must be done:

TASK TO BE PERFORMED	RESOURCES REQUIRED
Identify where screen is called from within application.	LTI Project Manager, CMPD Personnel
Identify and document business rules governing screen (control dependencies, required fields, messages to user, etc.).	LTI Project Manager, CMPD Personnel
Determine interface design.	LTI Interface Specialist
Determine desired data fields.	LTI Programmer
Make changes to data model as needed.	LTI Programmer
Determine tool tips, tab order desired for data entry, and online help.	LTI Technical Writer
Code screen.	LTI Programmer
Develop test scenario, results and script.	LTI QA Resource
Approve test scenario, results and script.	CMPD Personnel
Unit test screen.	LTI QA Resource
Document unit test results.	LTI QA Resource
Write User Manual.	LTI Technical Writer, CMPD Personnel
Document required information included in Interface Guide.	LTI Technical Writer

If CMPD chooses the dual database approach to the Community Interface, the following must also be done:

TASK TO BE PERFORMED	RESOURCES REQUIRED
Set up the additional tables to contain the public access data.	CMPD Database Administrator
Write PL/SQL script to copy appropriate data from the intranet version of the tables to the extranet version.	LTI Programmer
Add ability to call PL/SQL script to the Administrative form in the intranet section.	LTI Programmer

If CMPD chooses the single database approach to the Community Interface, the following must also be done:

TASK TO BE PERFORMED	RESOURCES REQUIRED
Add fields to data model to support restricted view flag.	LTI Programmer
Update the database tables with the data model changes.	CMPD Database Administrator
Determine workflow changes to allow approval of restrictive data.	LTI Project Manager, CMPD Personnel
Make changes to other application forms as required to support workflow changes.	LTI Programmer

Enhanced Reporting Capabilities

A review of the current application reveals the absence of a true reporting function. The current CMPD Problem Solving System contains searches and lists of problems that meet specific criteria; however, it contains no statistical reporting or measurement analytics.

Although the search results can currently be printed directly from the screen inside the browser, this information is not displayed in a format that is sufficient for usable reporting. Therefore, Lyon Technologies believes it would be beneficial to create a report with Crystal Reports® and then call this report when the search function is executed, in addition to the current routine. In this way, a Printable View of the report would be available, including a date/time stamp, headers, footers, the CMPD logo, and other formatting elements that CMPD can use to its advantage when analyzing and sharing data.

By providing this functionality, Lyon Technologies would go beyond the Custom Report specified in the CMPD Requirements document—we would provide a true report, as well as a search function that contains a parameter list with all the fields pertaining to a Problem.

A development and runtime license for Crystal Reports is bundled with the .NET environment. However, this version can only be used within the .NET development framework. If CMPD prefers to take advantage of additional reporting options, you might want to consider purchasing the standalone version of Crystal Reports. This would enable you to build your own custom reports against the CMPD problem-solving database, rather than limiting yourself only to reports in the new application. In addition, CMPD personnel could easily update the reports that Lyon Technologies created for the application.

If, in the future, you prefer to call any new reports directly from the new Problem Solving System application, it would be relatively easy to do that. Lyon Technologies can include instructions in the system Interface Guide that describe how to call reports from the new Problem Solving System so that the CMPD will not need to hire a technology professional to add this functionality.

As stated on their web site, Crystal Reports is a powerful reporting tool that enables organizations to design flexible, feature-rich reports. The query technology inherent in Crystal Reports can be used with virtually any data source, including XML, OLAP, and enterprise data sources. A wide variety of formatting options is available with this tool, giving organizations complete control over the appearance of their data. In addition, end user interactivity can be built into reports created with Crystal, and it contains features that enable organizations to maintain their reports and publish them to a web site.

Specific Recommendations

Lyon Technologies believes that if CMPD is going to invest in a new version of the current Problem Solving System, it would be wise to maximize your investment by taking advantage of the following reports, which you can access from within the new application or from a standalone version of Crystal Reports, depending on your preference:

Administrative Reports:

- User Access Rights
- Open Problems/Pending Problems Report

Problem Level Reports:

- Problem Summary Detail—lists all information known about a given problem
- Problem Overview—a report containing graphs depicting the following:
  - Number of Problems Date/Time
  - Number of Problems By Officer

Conversion of Existing Production Data

Scripts

Lyon Technologies will prepare a series of PL/SQL scripts that will make any required changes to the database structure required to support the new or enhanced functionality. Where any data conversion or movement between tables is required, the scripts will provide for that, as well.

To prevent data loss or inconsistency, we perform all database work on a transaction level basis. This is particularly critical with regard to the movement of data from one table to another. The scripts we provide will contain exception

handling and validation counts to assist in verifying the data process. For more information about this, see *Transaction-Based Programming* in the section *How Lyon Technologies Produces Maximum Quality Code* below.

Lyon Technologies, Inc. plans to use a test or development-level database to produce and test these scripts, rather than use production data for this purpose.

Specific Tasks Associated with Conversion of Existing Production Data

The tasks and the resources involved in converting the CMPD Problem Solving System's existing production data are detailed in the table below.

TASK TO BE PERFORMED	RESOURCES REQUIRED
Identify and compile changes to data model.	LTI Project Manager, LTI Programmer
Write PL/SQL scripts to implement table structure changes.	LTI Programmer
Write PL/SQL scripts to convert existing data to revised structure if required.	LTI Programmer

Quality Assurance

Overview

Two key factors that contribute to the production of high quality software are excellent programming and quality assurance. Unfortunately, the following limitations are often imposed on quality assurance activities during the software development life cycle:

- Quality assurance/testing tasks are left until end of the project. As a result, they are compressed into a reduced timeframe or even postponed indefinitely.
- The unit testing for a software project occurs, but it is confined to sporadic system level testing.
- Fixes are made to the various units, and no regression testing is performed afterwards to validate that other system components continue to function as they did previously.

Lyon Technologies takes a different approach to quality assurance and test plans than most IT firms. This approach can be summed up as follows: We design each screen, determine the business rules that govern it, and we develop the test plan and the expected results ***before*** we start coding the associated form. This enables the programmers to perform unit testing ***during*** the process of coding, rather than leaving all of the testing until the end of the software development life cycle.

Test Plan Creation

Lyon Technologies will create a complete set of Unit and System Test Plans for the CMPD project based on the *IEEE Standards on Software Development*—specifically, IEEE Std 730.1-1995, Guide for Software Quality Assurance Plans and IEEE Std 1008-1987 (Reaff 1993), Standard for Software Unit Testing.

Of course, we anticipate that, regardless of the time spent in unit testing, the new CMPD Problem Solving System will encounter some bugs from time to time. Following the detection of a reproducible bug, we will document the method or steps that caused it to occur and then add it to the unit test script for the corresponding form.

We will work with CMPD personnel to create the Acceptance Test Plan.

Specific Recommendations

In addition to unit and system level tests, Lyon Technologies recommends that the following tests be developed and executed:

Usability Test: Verifying that the system complies with ergonomic requirements, standards, and is intelligent and user friendly.

Stress Test: Checking the system behavior under extreme conditions or database loads.

Specific Tasks Associated with Quality Assurance

TASK TO BE PERFORMED	RESOURCES REQUIRED
Creation of Initial test Data set.	LTI QA Resource
Load of test data into database; preparation of script to erase data set and reload test starting point.	LTI Programmer
Design of test plans.	LTI QA Resource
Determination of expected results.	LTI QA Resource, CMPD Personnel
Log errors.	LTI QA Resource, CMPD Personnel
Clean up and reload of test data following testing process.	LTI Programmer
Create Acceptance test plan.	LTI QA Resource

How Lyon Technologies Produces Maximum Quality Code

When it comes to systems like the CMPD Problem Solving System, the database is at the heart of everything. The personnel at Lyon Technologies have been working with databases for more than 10 years; we know what it takes to make a database system work smoothly. The sections below provide details about the programming methods that we use to ensure that our software maximizes the power and functionality of the database.

Transaction-Based Programming

The programmers at Lyon Technologies write transaction-based code.

When dealing with multiple users affecting records on a database, it is important that all items be handled at a transaction level. A transaction is an inseparable list of database operations that must be executed either in its entirety or not at all.

Transactions either end with a *commit* or a *rollback* statement. If a transaction ends with a *commit* statement, then all the changes made to the database are made permanent. If the transaction fails or ends with a *rollback*, then none of the statements takes effect. If the database were to crash, rollback of all statements automatically occurs. The entire sequence of actions must be either completed or aborted.

By constructing our code in this way, Lyon Technologies maintains the data integrity of your system and guarantees that your database will always be in a consistent state.

Let's say, for example, that you have a rule that whenever a Problem is closed, the record for it is moved to a Problem Archive table. In this kind of scenario, two database actions actually take place: 1) the DELETE from the Problem table and 2) the INSERT into the Problem Archive table.

In a perfect world where databases never fail, both actions occur without any difficulty. However, if the database happens to crash or if the network fails, then only *part* of the actions required to perform the function might occur. For example, the database might fail *after* the DELETE has occurred but *before* the INSERT is carried out. In a case such as this, without the use of transactions, the database will be left incomplete because the Problem record has been DELETED.

By combining the DELETE and INSERT actions into one transaction, this kind of loss is prevented: If the database should fail after the DELETE has occurred, then the database will have a record of the partial transaction. When the system is restored, a rollback will occur, which places the Problem record back where it was when the operation was previously started.

Object and Class Development

Lyon Technologies has extensive experience in object-oriented application development. Microsoft .NET is an object-oriented development environment. As a result, objects and classes will need to be determined, coded, and then used throughout the application.

Objects are the key to understanding object-oriented technology. Software objects are modeled after real world objects in that they have state and behavior. Everything that the software object knows (state) and can do (behavior) is expressed by *variables* and *methods* within that object.

Of course, some objects share characteristics. At Lyon Technologies, we take advantage of this commonality and use a larger and more expansive blueprint for those objects. This larger software blueprint that we use to combine objects with shared characteristics is called a class.

For each object and class, Lyon Technologies defines the variables and methods, indicating the characteristics and functions of each object within the system.

Implementation of Referential Integrity

Lyon Technologies, Inc. uses the power of the database to implement referential integrity throughout the system.

Referential integrity is a database management safeguard that ensures that the references between tables in the database are valid, i.e., that every foreign key has a corresponding primary key. For example, problem numbers in the Problem table are the primary keys, and problem numbers in the Business_Problem table are the foreign keys. If a Problem record is deleted, the corresponding records in the Business_Problem table must also be deleted; otherwise they are left without a primary reference and are considered to be “orphan” records.

Referential integrity can be enforced at the application level or at the database level. If it is enforced at the application level, then the application must capture *every* instance in which a primary or foreign key could be inserted, updated, or deleted by the user. Although many applications attempt to enforce referential integrity at the application level, this is nearly impossible to do; therefore, it is better to implement it at the database level.

Within a database system such as Oracle, referential constraints can be defined. These constraints enforce the references between the database tables whenever an INSERT, UPDATE, or DELETE occurs. For example, if an administrator were to delete a value in a lookup table that was currently in use by an existing problem, this could cause an integrity problem in the database. To prevent this, Lyon Technologies would apply database constraints to enforce referential integrity in such a way that the delete action would not be allowed unless the corresponding

problem record were changed so that it no longer uses the corresponding data lookup value.

Implementation of Business Rules Via Database Stored Procedures & Triggers

> *"Business changes constantly, in small ways and large. It is rare to find an application product that can change once it is implemented. This gap is a reality leading to dissatisfaction and the application being a drag on the business. This gap, the lack of the ability to change, costs the business dearly. Software needs to be the agent of change, not the enemy of change."*—Dr. Prabir Dutt, *Infopower*

Traditionally, the logic that governed the functionality of an application was an intrinsic part of the code, itself. This meant that any other applications that used the same business rules had to have the same basic code segment within it. As long as the business rules did not change, this worked well enough. However, if a change needed to be made to the business rules, then a change to the application code had to be made, as well—not just to one set of code but to all the other sets.

A better solution is to implement business rules in database code that is created and executed directly on the database. These database code segments are called stored procedures or triggers. The application code merely calls the stored procedure. Therefore, if the business rules change, only the stored procedure code needs to be updated and the application does not need to get a change request. Code that is saved as a stored procedure can be executed anytime it is called from any screen in the application. Code that is saved as a trigger will execute only upon an INSERT, UPDATE or DELETE table operation.

When coding the CMPD Problem Solving System, Lyon Technologies, Inc. will implement the application code on the database via the use of stored procedures and triggers as much as possible. This powerful design strategy will enable CMPD to enforce business rules regardless of the origin of the SQL statement and the application that is sending it, thereby reducing the time required to locate the code, modify it, and test the changes. In short, you can maintain the CMPD Problem Solving System more easily in less time.

Use of Pre-developed Code for Generic Procedures

After years of developing software for other companies, Lyon Technologies has retained various sets of code for generic procedures that can be used again in almost any system. This saves our clients time and money because the code is already developed, and it can be added to various systems free of charge without requiring additional development time.

For example, Lyon Technologies recommended in the section *Modifications to the Current Screen Design* that the CMPD consider adding pagination to the

search results screens, rather than placing all of the search results on one long page. If the CMPD chooses to accept this recommendation, Lyon Technologies can add that functionality to the new Problem Solving System at no additional charge because we already have the set of code necessary to implement it.

Lyon Technologies has many common coding items in our universal "toolkit;" an advantage that could save the City of Charlotte time and money throughout the development life cycle of the new CMPD Problem Solving System.

Version Control

As part of our standard programming practices, Lyon Technologies uses SourceSafe®, a version control product.

The primary function of a version control system (VCS) is to allow each programmer to back up his code, preserving a complete, functional "latest version." It also enables a team of developers to periodically synchronize and merge all modules of a system together. A VCS, such as SourceSafe, is absolutely indispensable when multiple programmers are working together on a project. Team members "check out" their own copy of a project's files, make their changes, and then "check in" the new, updated code. If one programmer happened to work on the same code file as another programmer, then the VCS will merge the changes together accordingly.

One advantage of a VCS is that it does not discard the previous state of each file. In fact, keeps all the versions of every file in its database so that each programmer can retrieve them as needed. This gives the team the option to work with previous versions of their code at any time. A complete file set can be retrieved from a day ago, a week ago, or a year ago with ease.

In practice, no VCS actually stores complete versions of each file—that would take up too much storage space. Instead, it merely stores the differences between consecutive versions. This is ideal when attempting to track down a bug that appeared in a particular release.

Any type of file can be added to a VCS. Lyon Technologies uses SourceSafe for all its deliverables, from stored procedure code sets to .NET code to the user manuals that we produce.

Coding Standards

Lyon Technologies, Inc. adheres to a strict set of coding standards throughout our application development. For the .NET environment, we use the standards published and recommended by Microsoft. These standards address items from variable naming conventions to error raising guidelines.

Specific Tasks Associated with Code Development

The tasks and the resources involved in development of code for the CMPD Problem Solving System are detailed in the table below.

TASK TO BE PERFORMED	RESOURCES REQUIRED
Prepare object design specification detailing all objects necessary to support the screens and business logic.	LTI Project Manager, LTI Programmer
Review business rules and determine where they should go (stored procedure, trigger, class or object).	LTI Project Manager, LTI Programmer
Set up project in Visual SourceSafe.	LTI Programmer
Set up project in .NET, including global connection strings, etc.	LTI Programmer
Code all existing screens.	LTI Programmer
Code all new screens.	LTI Programmer
Write stored procedures as required.	LTI Programmer
Unit test code.	QA Resource
System test code.	QA Resource

CMPD Acceptance / Signoff

Lyon Technologies will develop an Acceptance Test Plan in order to provide a precise, detailed framework by which 'Acceptance' will be achieved. This test plan will be based on Unit and System test plans developed earlier and will provide a realistic and adequate exposure of the system to all reasonably expected events. Lyon Technologies will submit this test plan to a CMPD QA resource for review and approval.

If problems arise during testing, each problem will be assigned a severity level. Lyon Technologies prefers to use the same level names and criteria during testing that we use for our support/trouble ticket activities during the Warranty period. Each of these levels is listed below. Of course, CMPD is welcome to change the names and/or criteria, as desired.

1) **Show Stopper:** It is impossible to continue testing due to the severity of this error / bug.
2) **Critical Problem:** Testing can continue, but the system cannot go into production (live) while this problem exists.
3) **Major Problem:** Testing can continue, but this feature will cause disruption to business processes in live operation and must be addressed soon.

4) **Medium Problem:** Testing can continue, and the system can still go live with only minimal disruption to business processes.
5) **Minor Problem:** Both testing and live operations may progress. This problem should be corrected, but little or no changes to business processes are required.
6) **Cosmetic Problem:** Superficial changes to the user interface, such as changes to colors, fonts, and font size.

CMPD personnel, in consultation with the Lyon Technologies Project Manager, will meet and agree on the *responsibilities* of the various parties (Users, CMPD IT Staff, LTI Project Team), as well as the *required actions* and *timeframe* for each category of problems. For example, CMPD may decide that *all* Severity Level 1 problems will receive priority response and that all testing activity will cease until such problems are resolved.

Note: To avoid possible lengthy discussion regarding the severity level of problems, examples of each level will be agreed on and then distributed to project team members. If team members disagree about the severity level of a problem, the more severe level will be assumed.

Lyon Technologies and CMPD personnel will also work together to create a *Criteria for Acceptance and Signoff* document. Unfortunately, although we guarantee that we will do our utmost to prevent and eliminate errors, no system is absolutely error free. CMPD and Lyon Technologies, Inc., will collaborate and determine the maximum number of 'open items' in each problem category that will be acceptable for system signoff.

The Warranty period will begin on the day following the signature of the CMPD on the Signoff portion of the document. For more information about the Warranty, please see the *Warranties and Support/Maintenance* section below.

CMPD Resources

Support and ongoing administration of the application actually requires very few additional resources from CMPD. These resources are described below.

Required Software

The following software resources will be needed to support and administer the new CMPD Problem Solving System:

- A Test/ Development database to validate software patches and updates
- Microsoft .NET Framework
- Microsoft Visual Studio .NET

Optional Software

The following software is optional for maintaining and administering the system:

- Crystal Reports

  This software will not be necessary unless the CMPD chooses to take advantage of additional reporting options, as described in the *Enhanced Reporting Capabilities* subsection of the *Proposed Solution* section of this document.

- Software for remote access

  Remote access to the CMPD Problem Solving System is optional. However, if the CMPD provides this resource, then Lyon Technologies can resolve any problems that might arise much faster than we could without remote access.

CMPD Personnel

One CMPD personnel member would be needed for the following:

- To apply any software patches or updates as needed
- To validate bug existence, reproduce reported problems, document the steps that reproduce the reported problems, and submit that documentation to Lyon Technologies for problem resolution

Documentation

As specified in the RFP section 3.5.1, a paper copy and one electronic copy of all system documentation will be provided to CMPD upon completion and delivery of the system.

All documents will be delivered in either Microsoft Word® or PDF format or both, depending on CMPD's preference. If CMPD prefers delivery of documentation in online format, Lyon Technologies can provide documentation in online format, as well.

Installation and Setup Guide

Lyon Technologies will provide a step-by-step manual that clearly explains how the application is to be installed on CMPD's server, as well as on the client computers, if necessary.

Interface Guide (System Administrator's Guide)

Lyon Technologies will provide a complete interface guide (system administrator's manual). This manual will include the following:

- A list of each table used in the system
- A description of each column in the system and the specific information that is contained in each one
- A breakdown of each code module, along with a description of what each module does and the data tables that it references
- A data model

Lyon Technologies will communicate with CMPD's system administrator to ensure that he or she has all the information necessary to update and maintain the database system independently.

User's Manual

Lyon Technologies will provide a clear, user-friendly user's manual for the CMPD system users.

Our user's manuals are developed with usability research findings in mind; therefore, our manuals are very easy for users to read and follow. The user's manual for the CMPD Problem Solving System will include basic overview sections, explicit, simple steps, and screen shots for each part of the user interface.

Online Help

Lyon Technologies will provide online help for the user throughout the CMPD application. Online help instructions will be available from each screen. Our technical writer, Ceil Hall, has won several online documentation awards specifically for online help design and text and has completed projects for two government organizations: the North Carolina Department of Transportation and the United States Postal Service.

Warranties and Support/Maintenance

Overview

Due to complexity, all software is prone to bugs. In fact, in almost all cases one can assume that there will be some bugs and that it will be necessary to release multiple revisions of any software program. This holds true for *every* software vendor, from Microsoft® to Nintendo®.

Many variables exist that give rise to potential conflicts in an application: network speed and traffic, operating systems, hardware compatibility, conflicting drivers, power surge protection, database problems, and so forth. All these factors can lead to a variety of problems, including issues such as "hanging" the computer and so forth.

Problem resolution is generally a process of elimination; the obvious solutions are attempted first, and in a gradual, methodical manner a solution is obtained. In some cases problem resolution might be delayed while we search for alternative solutions from our extensive pool of resources. For this reason, we cannot guarantee the time it will take to fix a problem. However, we *do* guarantee that we will do our utmost to resolve whatever problem you might have as quickly as possible.

At Lyon Technologies, we strive to remain well informed of the potential problems that exist within the latest development environments (.NET), or databases (Oracle), as well as the availability of the latest fixes or patches for these problems and any compatibility issues that may exist.

For these reasons, Lyon Technologies does not warrant that the software developed shall be error free, although every effort will be made to ensure that it is so.

Lyon Technologies does not warrant that the software we deliver will operate with any hardware of software other than that specified in the RFP or in use at the client's site during Acceptance testing and at the date of Acceptance. Our position is that it is the Client's responsibility to validate that the delivered software satisfies the specified requirements.

Warranty and Support Policy

For ease of use, the details of Lyon Technologies' warranty and support/maintenance policies are explained in the following FAQs:

What is the standard warranty?

The standard warranty period is one (1) year. The warranty period begins when the software has been officially accepted by CMPD and expires 360 days later. During this time, all bug fixes are free of charge. This does not include enhancements or items that are not identified in the requirements specifications.

Is there an additional support service plan available?

Yes. After standard 1-year warranty has expired, CMPD can choose from any of the following available plans:

- An extended support plan of [redacted] (multiplied by the standard cost of living increase after the first year) is available for us to fix any additional bugs found.
- We can bill on a time & materials basis at [redacted].

When is support available?

- Technical support is provided by e-mail, fax, or telephone during standard business hours. Standard business hours are 8:30 a.m. to 5:00 p.m. Eastern Standard Time, Monday through Friday, excluding holidays.
- Lyon Technologies' response time for support calls is within four standard business hours. For more information about our response time, see the FAQ *"What response time or priorities does Lyon Technologies, Inc. employ when dealing with service calls?"* below.

When do support and maintenance begin?

Support and maintenance begin upon official Acceptance of the software.

What does official Acceptance mean?

Official Acceptance is the last milestone on the project plan.

What specific support services are provided in our standard support fee?

- E-mail, fax or telephone support.
- Remote access support, if permitted by CMPD's infrastructure and security policy.
- On-site visits are provided, with the following caveat: Any required on-site visits must be consolidated so that Lyon Technologies can maximize its travel time to Charlotte. For example, we would not want to make three separate visits to CMPD's site that require only 5 minutes of technical support time, each.

What happens if the database system crashes?

Lyon Technologies does not accept responsibility if your database system crashes.

Database crashes are a function of the Oracle database, not the software. If Oracle crashes and corrupts any data or if the database administrator doesn't properly restore the logs after such a crash, Lyon Technologies does not accept responsibility for that.

However, we will provide CMPD with transaction-level code; this means that, if the server crashes for some reason, the only loss that CMPD incurs should be the most recent transaction.

What happens if Microsoft updates. NET, Windows, or another component of the system, and suddenly the application doesn't work anymore or experiences some other technology infrastructure change?

Lyon Technologies does not accept responsibility for this. However, we will make every effort to correct the problem if CMPD has engaged our company in a support maintenance agreement, as described above in the FAQ *"Is there an additional support service plan available?"*

What happens if the IT personnel at CMPD upgrade the local PCs and that results in a problem with the application?

Lyon Technologies does not accept responsibility for this. However, we will make every effort to correct the problem if CMPD has engaged our company in a support maintenance agreement, as described above in the FAQ *"Is there an additional support service plan available?"*

What response time or priorities does Lyon Technologies, Inc. employ when dealing with service calls?

Our target response times are as follows:

- High Priority Problem: 30 Minutes
- Medium Priority Problem: 1 Hour
- Low Priority Problem: 4 Hours

Who owns the copyright to the finished software?

Unlike most vendors, which only provide "buyer" licenses to the companies that use their software, Lyon Technologies will give CMPD *all* of the rights to the software that we develop for your organization. This eliminates the need for source code escrow agreements in the unlikely event that Lyon Technologies, Inc. goes out of business.

What happens if Lyon Technologies, Inc. goes out of business?

Most vendors either have no provision at all for going out of business, or they provide for the escrow of the source code. Lyon Technologies is different in that we turn all developed source code over to the client, eliminating the need for escrow fees.

In the future, CMPD can hire nearly any programmer to update Lyon Technologies' code, if desired. Lyon Technologies prides itself on "working our way out of a job" with each client. When we finish each job, we make sure that our clients have everything they need to maintain it independently.

What happens of we want to develop another application in 10 years?

Lyon Technologies understands that no software fits the current technology forever. In the future, Lyon Technologies will gladly provide assistance to CMPD to move to a different software product, if necessary. Unlike other companies that do not provide database conversion services, Lyon Technologies is willing to help our clients get their information out of their database and convert it into a new format at any time.

Will LTI be marketing this software to other Police Departments or clients?

No. The software belongs exclusively to CMPD. Lyon Technologies will *not* market it to anyone else.

Does LTI have an ongoing program for updates and improvements?

All updates, improvements, or other future development will be specified and costs described in accordance with a separate RFP issued by CMPD. We will respond to the RFP with a Proposal document that describes the request and the necessary changes, along with the required costs, just we are providing in this document for RFP # 2004-099.

How does Lyon Technologies log trouble tickets? How do we know the status of a trouble ticket?

Trouble tickets can be logged via telephone, e-mail, or through Lyon Technologies' web site. As our client, you have a right to view the current status of any trouble ticket you log with us. You can view the status of your open trouble ticket at any time on our web site. Or, if you prefer, you can give us a call or send us an e-mail message to inquire about the status.

What distinction does Lyon Technologies make between bugs and enhancements to the application?

A bug is a reproducible problem that prevents the system from functioning correctly; a software enhancement is a change to the system that provides additional functionality or a change in the existing functionality.

What method of delivery will be used?

The initial deployment code will be installed and provided on a CD-ROM. Upgrades and other code enhancements or bug fixes will be delivered electronically and then shipped via CD-ROM, pending validation by the client.

Does Lyon Technologies guarantee specific response times within the application?

Although we make every effort to minimize database response times and maximize productivity, we do not guarantee them. The reason for this is that the database transaction might be only a small part of the user's perception of the response. For example, if the turnaround time on a database transaction is less than 3 seconds, people usually do not care that it takes 12 seconds to refresh the screen. Speed is dependent on numerous factors, including bandwidth, database load, and the number of users on the system, none of which can be guaranteed.

Key Personnel

We at Lyon Technologies, Inc. are highly selective about the individuals who join our staff, whether on a temporary or a permanent basis. Each staff member must have a high degree of technical expertise, as well as the ability to successfully relate to and communicate with non-technical end users. This is vital to our company's commitment to achieve our client's goals on a consistent basis.

Our proven track record during the past four years demonstrates our staff members' ability and commitment: other firms are downsizing; we have been growing.

The three highly trained, communicative Key Personnel identified for the CMPD Problem Solving System are as follows:

Stephanie Lyon, Project Manager and Developer

Stephanie Lyon has provided a broad spectrum of programming, administration, management, and training services to the IT industry for more than 15 years. She has served companies such as Lucent Technologies, Nortel, Inc., Data Direct Technologies (formerly Intersolv), Blue Cross Blue Shield, and Zales Jewelers.

Ms. Lyon has designed, created, and administered customized database applications for client-server systems; provided consulting assistance in data warehousing architecture and implementation; coordinated technology efforts with third-party products and vendors; managed software development projects; and provided database administration, report development, and training services. She has also assisted in the conversion of company database systems to Visual Basic/ORACLE and has led development team efforts to interface a remote AS400 database system with local database systems, establishing infrastructure architecture, development policies and procedures, as well as hiring the staff and managing the project. She has provided high-level technical support for OEM clients and designed, produced, and taught classes in SQL, ODBC and other technologies.

Ms. Lyon's work resulted in an increase of more than 600% in revenues for a local information technology consulting firm. The staff at this office grew from 3 people to 13, and she handled all the associated management responsibilities. She was selected to speak at the 2001 and 2002 International Business Objects User Conferences. She assisted in the integration of PeopleSoft ERP and Business Objects for a global data warehousing effort, including universe design, report development, and user training. Ms. Lyon has conducted user training in the United States, Singapore, Mexico, and The Netherlands.

Ms. Lyon started Lyon Technologies, Inc. four years ago to provide clients with information technology and business intelligence solutions. Her firm specializes in the development of internet applications using ASP.NET, web site construction, technology training and Business Objects deployments.

Her software experience includes ORACLE , SQL Server, mySQL, Business Objects Suite (including SDK), ASP.NET, PHP, Visual Basic, ERwin, HTML and numerous others. She is a Certified Business Objects Trainer, Certified ERWin & Data Modeling Instructor, and Certified BPWin Instructor.

Ms. Lyon has provided distinguished service to the United States Coast Guard and holds a B.S. in Mathematical Science from the United States Coast Guard Academy.

Donald Strong, Developer

For nearly 20 years, Donald Strong has developed applications for a variety of distinguished companies, including Progress Energy (formerly Carolina Power & Light) and GE Capital Mortgage Corporation. He has also owned and operated his own development company, Tropical Systems. Mr. Strong began working for Lyon Technologies in 2003, providing consulting assistance in Business Objects, ASP.NET, n-tier architecture, and software development.

At Lyon Technologies, Mr. Strong developed a web portal in ASP.NET, which uses the Business Objects SDK to generate and display reports through a web browser interface. He also developed a prototype for the Motor Fleet Management system, which uses VB.NET, SQL Server, and stored procedures to display data via a web browser, and he designed and built an automated SMTP mailer in VB.NET.

Prior to joining Lyon Technologies, his work included the development of an automated calling system, contact management databases, educational software, cross-platform desktop systems, and LAN monitoring, as well as other desktop productivity applications. He developed client/server products to replace and update legacy mainframe applications, creating a TCP/IP socket interface between the external system and internal Sybase database utilizing Unix, C++, and SQL.

Mr. Strong has received numerous employment promotions as a result of the quality and speed of his development work. He has received multiple awards for excellent customer service throughout his long-standing service in his industry. He has programming experience in numerous software technologies, including SQL Server/Sybase, Microsoft Access, SQL, Visual Basic, VB.NET, ASP.NET, ADO.NET, Business Objects Suite (including SDK), HTML, CGI scripts, ODBC, Pronexus VB Voice, and TCP/IP Sockets. He holds a degree from Wake Technical Community College and has completed classes at North Carolina State University. He has also participated in training sessions in a variety of technologies, such as Microsoft Foundation Classes and Visual C++.

New Programmer

Lyon Technologies will provide the new programmer’s biography and resume as soon as we hire this professional.

QA Resource

Lyon Technologies will provide the QA Resource’s biography and resume as soon as we contract this professional for this project.

Ceil Hall, Technical Writer

With more than 15 years of experience in technical writing, Ceil Hall specializes in helping organizations make positive, effective transitions to new processes and procedures, guiding both management and staff with clear, communicative documentation.

Ms. Hall writes both process documentation and software user manuals in a wide variety of hard copy and online formats, including policy documentation; standard operating procedures; online help for client-server applications; and Web-based instructions for Internet, intranet, or extranet environments. She is proficient in the current authoring tools, including Microsoft Word® for hard copy documentation, RoboHELP® and ForeHelp® for standalone online help, and Dreamweaver® for web-based online help and other web documentation.

Ms. Hall has helped Unifi Corporation upgrade their database and inventory management systems in every department, including their Human Resource operations in Ireland. She assisted Amdahl Corporation with a new enterprise management system installation in offices throughout the United States Postal Service. At Sertus Corporation, her documents enabled the Chief Technical Officer to communicate innovative hardware and software design concepts to the company's engineers, as well as to the IT managers of the parent company, Clear Channel Communications. Stock Building Supply, a subsidiary of Wolseley, used her documents to design and install a document imaging solution in their Accounts Payable department, dramatically streamlining their operational throughput. She has worked for Lyon Technologies since January of 2003, creating online and hard copy manuals for various software applications.

A Senior Member of the international Society for Technical Communication, Ms. Hall has received five awards, including four online documentation awards and a Pacesetter Award for providing affordable training opportunities for new technical writers. *Intercom* magazine, an international publication for technical writing, has published two of Ms. Hall's articles about technical communication. In May 2000, Ms. Hall was invited to present her work at the STC's international annual convention. She holds degrees from Northwestern University and the University of North Carolina at Chapel Hill.

Resumes of Key Personnel

Please see the attached pages directly following this page to view all Key Personnel resumes.

Supplemental Information

Costs

To best serve the interests of the CMPD and the City of Charlotte, Lyon Technologies is providing several alternatives for development time and project cost.

Fixed Bid Options

Fixed Bid Option 1

Team composed of 1 Project Manager, 2 full time developers, 1 QA Resource, and 1 Technical Writer/User Interface Specialist.

- Development Time: 4.5 months
- Cost to CMPD: [redacted]

Fixed Bid Option 2

Team composed of 1 Project Manager, 1 full time developer, 1 QA Resource, and 1 Technical Writer/User Interface Specialist.

- Development Time: 6.5 months
- Cost to CMPD: [redacted]

Notes for Fixed Bid Options

- Costs include estimated Travel and Expenses from Raleigh to Charlotte.
- The costs for both Option 1 and Option 2 can be reduced significantly if a portion of the development work can be done remotely. Of course, this does ***not*** mean that there will be no site visits. Site visits will be planned for 2-week intervals or on an "as needed" basis.

Time & Billing Options

Personnel Rates

- Project Manager: [redacted]
- Developer: [redacted]
- QA Resource: [redacted]
- Tech Writer/User Interface Specialist: [redacted]

Time & Billing Option 1

Team composed of 1 Project Manager, 2 full time developers, 1 QA Resource, and 1 Technical Writer/User Interface Specialist for the Personnel Rates listed above.

Time & Billing Option 2

Team composed of 1 Project Manager, 1 full time developer, 1 QA Resource, and 1 Technical Writer/User Interface Specialist for the Personnel Rates listed above.

Notes for Time & Billing Options

- The costs for Time & Billing Options 1 and 2 do not include Travel and Expenses from Raleigh to Charlotte. $.375/mile plus straight remuneration for hotel costs.
- The Project Manager will be billed at the lower rate for Programmers when performing development tasks.
- In order to assure CMPD that Lyon Technologies, Inc. is in the business of *delivering*, rather than in the business of billing, LTI will provide the project team members with incentives for minimizing development timeframes.

Hierarchical Problem Setup

If CMPD wishes, Lyon Technologies can add functionality to the application that allows a Problem to be composed of other Problems in a hierarchical manner. In doing so, an additional form would be added to the application that displays associated problems in a tree-type layout. CMPD personnel could then "drill-down" into different levels of problem viewing.

The additional cost to the CMPD for this optional functionality is [redacted].

Spell Check Data Entry

If CMPD wishes, Lyon Technologies can also add functionality to the application that enables any text in a free form field to be spell checked. This would make it more likely that the data in the Problem Solving System would be of professional quality, especially if the public views it through the community access screens.

The additional cost to the CMPD for this optional functionality is [redacted].

GIS Interface/Problem Mapping Functionality

In the interest of CMPD's desire to utilize GIS functionality, such as identifying problems within a particular defined area or plotting problems by location, Lyon Technologies located and analyzed a GIS product that may be of assistance.

Due to proposal deadline time constraints, Lyon Technologies, Inc. cannot provide a quote for the product or the cost to integrate it into the CMPD Problem Solving application at this time. However, for your own reference, the product name is Maptuit.

Discussions with sales staff at Maptuit indicate that the product will perform the functionality desired by CMPD and that it can be interfaced with a .NET application through an API. However, Lyon Technologies cannot verify the accuracy of these statements at this particular point in time.

Required Forms

Please see the attached pages directly following this page to view all required forms for RFP # 2004-099.

Exceptions to the RFP

Reference: Requirement # R033. Supplementary Narratives. The cost of this functionality is not included in this quotation. If it is desired, we will gladly prepare a cost proposal to include it.

Reference: Requirement # R094. Calls for Service Data screen. The cost of this functionality is not included in this quotation. If it is desired, we will gladly prepare a cost proposal to include it.

Reference: Requirement #141. Lyon Technologies, Inc., will not provide any ad-hoc reporting capability within the application for this quote. We know of several third-party products, such as BusinessObjects® and Microsoft Reporting Services®, that provide this capability. We will be happy to consult with the CMPD to help you decide which product would be best for providing this functionality. **Note:** This exception is *not* to be confused with the creation of *new custom reports*—that provision is part of the RFP, and we *will* provide it.