

**Scope of Work for TSS Maintenance and Upgrades**  
**November 2006 through December 2007**  
**July 26, 2006**

*Operations, Maintenance and TSS Development*

**Task 1: Hardware Maintenance**

Upon its launch in October 2006 the TSS will potentially require four server machines for its operation: a web server, a database server, a GIS server, and a backup/file/failover server. Communication between these servers will be facilitated by a Gigabit (1000 mbps) Ethernet network. The continuing operation of the server machines and the network will require a certain minimum level of maintenance and attention. Hardware problems and network communication issues that arise will need to be resolved and routine backups will need to be performed in order to safeguard the data and software resources on the server machines. As the TSS becomes more heavily visited and used, load balancing and performance optimization will need to be performed, and bandwidth limitations may need to be identified and resolved. These operations may necessitate the purchase of new or replacement hardware and may necessitate occasional system outages in order to address. In summary, maintenance will be required on the following hardware components:

- Web server, database server, GIS server, file server
- Intranet and Internet infrastructure (Cat5 cabling, switches, routers, NICs, etc.)
- Back up and failover systems (external hard drives, tape drives, mirror servers, etc.)

CIRA will be solely responsible for this task.

**Task 2: Commercial Software Maintenance**

The TSS will also require a variety of commercial third-party software for its functioning and operation. This software will need to be installed, configured, and operated on an ongoing basis throughout the lifecycle of the TSS, and issues and problems with the software will need to be identified and resolved. In general, the necessary commercial software will fall into the following categories:

- Server software (IIS, FTP, etc.)
- Server operating system software (Window Server 2003 and components)
- Database software and services (MS SQL Server, Red Gate SQL Bundle, etc.)
- GIS software (ESRI Arc/GIS, /SDE, /IMS, /View, etc.)
- Development tools (MS Visual Studio, SQL Server Reporting Services, etc.)

CIRA will be primarily responsible for this task. Minor support may be supplied by ENVIRON or Image Matters as necessary.

### **Task 3: Custom Software Maintenance**

A large body of custom software is being developed for the TSS, and this software infrastructure will also require a certain level of maintenance and attention. Bugs and issues will need to be identified and resolved, refinements and improvements will need to be made, and help and documentation will need to be written. The software being developed for the TSS falls into the following general categories:

- User interface (navigation, readability, behavior, usability)
- Data access tools (query, transformation, calculation, and presentation)
- Custom analytical tools (charting, graphing, and plotting tools)
- GIS support tools (composite web tools using GIS components)
- Integrated Map Analysis Tool (IMAT)
- Static product browsing tools (documents, images, presentations, etc.)
- Base web site operation tools (login and security, feedback mechanisms, saving work, etc.)

CIRA will be primarily responsible for this task except for IMAT maintenance. IMAT maintenance will be performed primarily by Image Matters, with involvement from CIRA for integration issues.

### **Task 4: TSS Version Releases**

The data, tools, and analyses obtained from the TSS will need to be carefully version-controlled. As new data and tools are added or refined, work done with previous versions of the data and tools will still need to be supported and users will need to be able to recreate previous analyses done with earlier versions of TSS resources. This version control will be achieved by adhering to the following general protocol:

- Periodically, a complete “snapshot” of the TSS will be taken and archived. The “snapshot” will include:
  - Current monitoring, modeling, emissions data and associated documentation
  - Tools as they currently exist (versions may have different-looking tools)
  - Relevant in-house GIS layers and URLs to relevant outside GIS layers
  - External analyses uploaded to the TSS
- Each version of the TSS will remain untouched under a unique URL, fully accessible by users. At any time several versions of the TSS will be available on-line. Anticipation versions include:
  - Current (contains most up-to-date data/tools, but may change without notice)
  - Version 1 (estimated archive date: October/November 2006)
  - Version 2 (estimated archive date: Spring 2007, after anticipated final updates to emissions and modeling)
  - Version 3 (estimated archive date: December 2007, after SIP process is complete)
  - Additional Versions (estimated archive date: annually starting in 2008 to accommodate new data and additional analyses)

This protocol will need to be further refined and elaborated during the 2007 project year, and CIRA will be primarily responsible for this task in conjunction with guidance from the WRAP and other TSS partners.

### **Task 5: User Technical Support**

TSS users will require a certain level of technical support and guidance during the lifecycle of the system. User questions and feedback will need to be fielded and addressed in a sufficient and timely manner, and the TSS development team will need to assist users in finding, understanding, and using the various tools and resources on the website. Any hardware or software issues that users experience will also need to be addressed and various compatibility issues will need to be resolved. Anticipated technical support issues fall into the following general categories:

- Questions, comments, and general feedback
- General technical difficulties (browser, OS, and configuration issues)
- Usability and accessibility issues
- Suggestions, requests, and inquiries

These technical support issues will be handled primarily through the user Feedback feature or through direct email to the TSS development team, though some problems will require direct telephone support from TSS staff. CIRA will be solely responsible for this task.

### ***User Support for Regional Haze Planning and Ongoing TSS Development***

#### **Task 6: Analytical Tool Enhancement**

The October 2006 release of the TSS will include information, data, and functionality sufficient to meet SIP writers' core needs. However, web site and analytical tool enhancements are expected to occur throughout 2007. This work will be based on already scheduled enhancements and early user feedback. An example of a scheduled enhancement is development of a method for users to upload data and analyses to the TSS. This effort will be scoped prior to the October 2006 release of the web site, but actual development will occur after that time.

CIRA and ARS will be primarily responsible for this task. Support may be supplied by ENVIRON and Image Matters.

#### **Task 7: Integrated Mapping and Analysis Tool Enhancement**

The October 2006 release of the TSS will include a fully functioning Integrated Mapping and Analysis Tool (IMAT). However, several features which will significantly enhance the IMAT in terms of user functionality and direct connections between the TSS and other programs will continue to be developed through 2007. These enhancements include:

- **Data Presentation.** Enhance IMAT map view GUI and capabilities e.g., add legend service.

- **Data Analysis Tools.** Analytical tool enhancements (Task 6), as supported by IMAT deployment. This would include cases for which IMAT components would automate a task in a dynamic manner, for example:
  - Cases in which geospatial analysis and/or map display was required for the task associated with an item on the Weight of Evidence (WOE) Checklist.
  - Linking geospatial features (e.g., CIA with states or specific land areas) from data products such as the Phase I Attribution Matrix, or Weighted Emission Potential to enable more dynamic and interactive products.
- **Data and Metadata Exchange.**
  - The capability for user export of monitoring, emissions, modeling, and GIS layer data and metadata in format(s) defined by user requirements.
  - The capability for user to import monitoring, emissions, modeling, and GIS layer data and metadata into the system.
  - Fuller implementation of metadata and/or supporting data processing documentation.
  - Provision of metadata creation and validation tools for users wishing to upload data to the system.
- **Data Integration.**
  - Continued development of the web feature service (WFS) to allow analyses of underlying data on map products, and to host certain layers that would otherwise not be available for integration at feature level (e.g., Mexico county boundaries) via WFS.
  - Capability to integrate other databases on the TSS (as part of Task 9)
- **Catalog/Registry.** Identify and register key WRAP-relevant layers that are external to the TSS but available as web services. Make these available as “suggested layers” through IMAT GUI.
- **Spatial Data Infrastructure** (as part of Task 2 and Task 3)
  - Install and configure ArcSDE and ArcIMS at CIRA; load data; re-establish scaling service.
  - Deploy IMAT components in TSS pages.

Image Matters will be primarily responsible for this task. Support will be supplied by CIRA.

### **Task 8: User Training**

It is critical that the SIP writers and state analysts be fully trained on the TSS, and that they are offered ample opportunities to ask questions of TSS team members. The following tools will be used to facilitate TSS training:

- **Monthly IWG Calls.** TSS members will participate in monthly teleconference calls of the Implementation Work Group. On these calls TSS members will update the IWG on the status of the TSS and answer questions that have come up since the previous call.
- **Training Sessions.** The TSS team will hold up to 3 training sessions via teleconference and Webcast beginning in October/November 2006. Additional training sessions will be scheduled in cooperation with IWG, and are expected to

occur through Spring 2007. Each session will focus on a small number of analysis tools or analysis results, allowing the training to be done at a fairly in-depth level. The training sessions will span all major pieces of the TSS that support the preparation of SIPs. This is an economical and efficient way to train users, and it is believed that after several dedicated training sessions most general and technical questions will have been addressed. Remaining, highly specific questions will be addressed as described below. No travel by WRAP members or TSS members will be required.

- **Additional User Support.** TSS members will continue to support TSS users with technical and analytical questions once formal training sessions have ended. The amount of additional support that will be available is limited by budget constraints. Questions requiring minor support effort will almost always be answered. Questions requiring significant support effort will be evaluated, and those which have regional impacts will be given highest priority.

Training will be supported by all members of the TSS team.

### **Task 9: Additional Analyses**

Development of the TSS is expected to continue through the end of 2007. Existing analytical tools will be enhanced and new analytical tools will be developed during this period. States may desire to add their own analyses to the TSS. The following options will be supported to accommodate these changes and support TSS users:

- **Integrate Additional Monitoring, Emissions and Modeling Data.** TSS members will integrate monitoring data provided by IMPROVE, and emissions and modeling data that is delivered by the RMC or other agency (as feasible) into the TSS database and analytical tools. It is anticipated that the RMC will deliver emissions and modeling data based on one or more control scenarios between October 2006 and Spring 2007.
- **Perform Requested Analyses.** TSS members will be available to perform specific analyses requested by individual states or WRAP staff. The number and complexity of additional analyses that can be performed is limited by budget and time constraints. All additional analyses will be scoped and approved by WRAP staff. Analyses that deal with regional impacts will be given highest priority.

Additional analyses will be supported primarily by ARS, CIRA, and ENVIRON.

### ***Cost Estimates for TSS Work, November 2006 through December 2007***

Table 1 contains cost estimates for TSS work to be completed between November 2006 and December 2007.

Table 1  
TSS Cost Estimates by Task  
November 2006 through December 2007

| Task No. | Task Name   | Cost (\$) |            |
|----------|---|-----------|------------|
|          |   | CIRA      | ARS/ENV/IM |
| 1        | Hardware Maintenance                                      | 15,000    |            |
| 2        | Commercial Software Maintenance                           | 15,000    | 5,000      |
| 3        | Custom Software Maintenance                               | 20,000    | 10,000     |
| 4        | TSS Version Releases                                      | 30,000    | 5,000      |
| 5        | User Technical Support                                    | 10,000    |            |
| 6        | Analytical Tool Enhancement                               | 30,000    | 25,000     |
| 7        | Integrated Mapping and Analytical Tool (IMAT) Enhancement | 5,000     | 15,000     |
| 8        | User Training   | 10,000    | 15,000     |
| 9        | Additional Analyses                                       | 15,000    | 25,000     |
| TOTAL    |   | 150,000   | 100,000    |