



## **LEGAL NOTICE**

### **REQUEST FOR PROPOSAL**

**RFP 19-089**

**For**

**CONSULTANT SERVICES –  
REGIONAL ITS DATA SHARING INITIATIVE – PHASE 1**

**CMAQ-7302(680)**

**ST. CHARLES COUNTY GOVERNMENT  
ST. CHARLES, MISSOURI**

St. Charles County is seeking Statement of Proposal from Professional Service Firms to provide **Consultant Services for Regional ITS Data Sharing Initiative** for the County in coordination with MoDOT. The County reserves the right to terminate the contract for reasons of violations by the successful proposer of any term or condition of the contract by giving thirty (30) days written notice stating the reasons therefore and giving the party ample time to remedy the deficiencies.

**REQUEST FOR PROPOSALS FOR  
CONSULTANT SERVICES –  
REGIONAL ITS DATA SHARING INITIATIVE – PHASE 1**

**RFP # 19-089**

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## INSTRUCTIONS

One [1] signed original and four [4] signed copies of the Statement of Proposal must be received in a sealed envelope plainly marked “**19-089 Consultant Services - Regional ITS Data Sharing Initiative, CMAQ-7302(680)**” with the due date and time in the lower left corner of the envelope.

An authorized representative of the company/person submitting the statement of qualification must sign it in blue ink.

Statements of Proposals must be submitted to the St. Charles County Finance Department, 201 North Second Street, Room 541, St. Charles, MO 63301 prior to **08/09/2019 at 2:00 PM**.

St. Charles County reserves the right to accept and/or reject any and all proposals.

## INQUIRIES

Any questions or clarifications concerning this RFP must be submitted in writing to:

Kurt Mandernach, Purchasing Manager  
St. Charles County Government  
Finance Department  
201 North Second St  
St. Charles, Missouri 63301  
[kmandernach@sccmo.org](mailto:kmandernach@sccmo.org)

**For questions or inquiries concerning the specifications please contact:**

Amanda Brauer, Manager  
St. Charles County Government  
Roads and Traffic Department  
201 North Second St  
St. Charles, Missouri 63301  
Fax: (636)949-3074  
[abrauer@sccmo.org](mailto:abrauer@sccmo.org)

- The RFP number and title shall be referenced on all correspondence.
- All questions must be received no later than **5:00 PM** on **07/30/2019**.
- Any question received after this deadline may not be answered.

### **Prohibited Communication**

***Contact with any representative, other than through the procedure outlined in the section titled “Inquiries”, concerning this request is prohibited PRIOR TO PROPOSAL DUE DATE. Representative shall include, but not be limited to, all elected and appointed officials, and employees of St. Charles County and their Agents within St. Charles County. Any Offeror engaging in such prohibited communications prior to proposal due date may be disqualified at the sole discretion of St. Charles County.***

## CERTIFICATIONS BY OFFEROR

- The undersigned signatory certifies that he/she has read and understands all of the terms and conditions of this RFP and of doing business with the County in response to this RFP, that in doing so he is acting on behalf of the Offeror, and that his/her signature placed hereon is binding on the Offeror to the full extent allowed by law.
- The Offeror shall provide a Proposal to the County in response to, and in accordance with, the terms of this RFP.
- The Offeror agrees to provide the services under the terms of this RFP and the Proposal as accepted by the County.
- By submitting the Proposal in response to this RFP, the Offeror and each person signing on behalf of the Offeror, under penalty of perjury, certifies to the best of its knowledge and belief:
  - ✓ The Offeror has established the price terms in this Proposal independently without collusion, consultation, communication or agreement with any other Offeror as to any matter relating to such price terms; and
  - ✓ The Offeror has made no attempt, and will not in the future make any attempt, to induce any other person, partnership or corporation to submit or not to submit a proposal for the purpose of restricting competition.
  - ✓ The Offeror certifies that this proposal is in all respects fair and without collusion or fraud, and that no elected official or other member, officer or employee or person whose salary is payable in whole or in part by the County is directly or indirectly interested therein, or in any portion of the profits thereof.

Company Name: \_\_\_\_\_  
Authorized Signature of Offeror: \_\_\_\_\_  
Date of Proposal: \_\_\_\_\_  
Printed or Typed Name: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Telephone: \_\_\_\_\_  
Fax: \_\_\_\_\_  
Electronic Mail: \_\_\_\_\_

## TERMS AND CONDITIONS

- St. Charles County reserves the right to reject any and all Proposals.
- No additions, deletions, corrections, or adjustments will be accepted after submissions are opened.
- The electronic version of this proposal/RFP is available upon request. The document was entered into WORD for Microsoft Windows. The Purchasing Office does not guarantee the completeness and accuracy of any information provided on the electronic version. Therefore, respondents are cautioned that the hard copy of this proposal/RFP on file in the Purchasing Office governs in the event of a discrepancy between the information contained in or on the electronic version and that which is on the hard copy.
- An authorized officer of the company submitting the response must sign all copies, in blue ink.
- Vendors must submit five [5] signed copies of their Statement of Proposal; one is to be an original and so marked.
- Interested firms are requested to submit a Statement of Proposal of no more than thirty (30) pages.
- St. Charles County will not award any proposal to an individual or business having any outstanding amounts due from a prior Contract or business relationship with the County or who owes any amount(s) for delinquent Federal, State or Local taxes, fees and licenses.
- Sealed submissions received after the designated time of the receipt of the sealed statements will not be opened.
- The successful firm is specifically denied the right of using in any form or medium the names of St. Charles County or any other public agency of St. Charles County Government for public advertising unless express written permission is granted.
- All firms must possess the necessary and appropriate business and/or professional licenses in their field.
- No 2nd tier subcontracting will be allowed on this project.
- The successful firm shall be registered to do business in Missouri and shall provide a Certificate of Good Standing from the Missouri Secretary of State's Office prior to executing a contract with St. Charles County.
- St. Charles County hereby notifies all interested parties that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, businesses owned and controlled by socially and economically disadvantaged individuals will be afforded full opportunity to submit proposals in response to this invitation and will not be discriminated against on the grounds of race, color, religion, creed, sex, age, ancestry, or national origin in consideration for an award.

- Award will be made to the firm best qualified and capable of performing the desired work, subject to successful contract negotiations.
- **INSURANCE:**  
**Errors and Omissions (Professional Liability):** With limits of not less than \$1.0 million per claim/\$2.0 million aggregate covering all services provided by the Contract. Coverage to be written on a claims-made basis.

**Commercial General Liability (CGL):** \$1,000,000/\$3,000,000 including Products/Completed Operations. CGL coverage shall cover all liability arising from premises, operations, independent contractor and personal injury and liability assumed under an insured contract.

**Automobile Liability:** covering liability arising out of the use of any owned, hired, leased or non-owned vehicle in an amount of no less than \$1,000,000 per occurrence.

**Workers Compensation/Employer's Liability:** Statutory WC limits as required by the Statutes of the State of Missouri, (or a qualified self-insurer) and Employers Liability in an amount of no less than \$1.0 million.

**Excess Umbrella:** liability with a limit of no less than \$1,000,000 in excess of the above policies.

- All insurance to be written through a company duly authorized to do business in the State of Missouri with an A.M. Best Rating of A-IX or higher.
- The Professional Liability, CGL, Automobile and Umbrella policies shall be endorsed to include the County as an additional insured and provide for 30 days advance written notice of any material change.
- A Waiver of Subrogation in favor of the County shall be endorsed on each of the policies.
- The required insurance provided by the "Firm" shall be primary insurance with respect to any other insurance or self-insurance programs maintained by the County.
- A Certificate of Insurance evidencing the above coverage(s) together with a copy of the required endorsements shall be provided to the County prior to the commencement of any work.

### **Certification**

The Firm understands and agrees that by signing the statement of Qualification document, the Firm certifies the following:

The Firm shall only utilize licensed professional personnel who have had their qualifications submitted as part of the Firm's Qualifications document (or subsequent updates). All personnel utilized must be authorized to work in the United States in accordance with applicable federal

and state laws. This includes but is not limited to the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) and INA Section 274A.

If the Firm is found to be in violation of this requirement or applicable federal, state and /or local laws and/or regulations, and if the County of St. Charles has reasonable cause to believe that the Firm has knowingly employed individuals who are not eligible to work in the United States, the County shall have the right to cancel the contract immediately without penalty or recourse and suspend or debar the Firm from doing business with the County.

The Firm agrees to fully cooperate with any audit from federal, state, or local auditor or investigation by federal, state, or local law enforcement agencies.

The Firm agrees to Certifications for Federal-Aid Projects as follows:

### **Certifications for Federal-Aid Projects**

(Note: These certifications are from MoDOT Standard Specifications Section 102.18.)

**102.18 Certifications.** The bidder makes the following certifications by signing and submitting the bid.

**102.18.1 Certification Regarding Affirmative Action and Equal Opportunity.** If the bidder does not meet all requirements set forth in sub-paragraphs (a), (b) and (c) of this section, then the bidder shall submit a statement indicating which elements the bidder has complied with and those elements that are not in fact true and correct. The statement shall be on company letterhead, signed by the bidder and inserted inside the submitted bid. The bidder shall provide the following elements:

- (a) The bidder has developed and has on file at each of the bidder's establishments affirmative action programs pursuant to 41 CFR Part 60-2.
- (b) The bidder has participated in a previous contract or subcontract subject to the equal opportunity clause set forth in 41 CFR 60-1.4 and Executive Order No. 11246.
- (c) The bidder has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance Programs or the Director's designate or the EEO Commission, all reports due under the applicable filing requirements contained in 41 CFR, Part 60-1.

This certification applies to and shall be executed by each bidder or proposed subcontractor if the proposed contract or subcontract on this project will equal or exceed \$10,000.00. This certification will also apply to any contractor or subcontractor that has contracts or subcontracts on federally assisted projects in any 12-month period that have or can reasonably be expected to have an aggregate total value exceeding \$10,000.00, 41 CFR 60-1.5(a)(1). The prime contractor shall assure that each of the subcontractors that meet the criteria will also execute and submit this certification to the Commission.

**102.18.2 Certification Regarding Disbarment, Eligibility, Indictments, Convictions or Civil Judgments.** The president or authorized official of the bidder, under penalty of perjury under the laws of the USA, shall certify that, except as noted in the exceptions, the company or any person

associated therewith in the capacity of owner, partner, director, officer, principal investor, project director, manager, auditor or any position involving the administration of federal funds:

- (a) Is not currently under suspension, debarment, voluntary exclusion or determination of ineligibility by any federal agency.
- (b) Has not been suspended, debarred, voluntarily excluded or determined ineligible by any federal agency within the past three years.
- (c) Does not have a proposed debarment or suspension pending.
- (d) Has not been indicted, convicted or had a civil judgment rendered against any of the listed parties by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three years.

**102.18.2.1** If there are any exceptions, the bidder shall submit the exceptions on company letterhead, signed by the bidder and inserted inside the bid submitted.

**102.18.2.2** Exceptions will not necessarily result in denial of award but will be considered in determining bidder responsibility.

**102.18.2.3** For any exception noted, the bidder shall indicate to whom it applies, the initiating agency, and dates of action.

**102.18.2.4** Providing false information may result in criminal prosecution or administrative sanctions.

**102.18.3 Certification Regarding Anti-Collusion.** In accordance with 23 USC 112, the bidder shall certify, under penalty of perjury, that the bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this contract.

**102.18.4 Certification Regarding Lobbying Activities.** In accordance with 31 USC 1352, the bidder shall certify that:

(a) No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any federal agency, a member of Congress, an officer or employee of Congress or an employee of a member of Congress in connection with the awarding of any federal contract, the making of any federal grant, the making of any federal loan, the entering into of any cooperative agreement and the extension, continuation, renewal, amendment or modification of any federal contract, grant, loan or cooperative agreement.

(b) If any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any federal agency, a member of Congress, an officer or employee of Congress or an employee of a member of Congress in connection with this federal contract, grant, loan or cooperative agreement, the bidder shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with the instructions.



**102.18.4.1** This certification shall be a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification shall be a prerequisite for making or entering into this transaction imposed by 31 USC 1352. Any person who fails to file the required certification will be subject to a civil penalty of no less than \$10,000 and no more than \$100,000 for each such failure.

**102.18.4.2** The bidder also agrees by submitting a bid that the bidder shall require that the language of this certification be included in all subcontracts that exceed \$100,000, and that all such subrecipients shall certify and disclose any lobbying activities accordingly.

**Employment of Unauthorized Aliens Prohibited (Missouri Revised Statutes Section 285.530)**

As a condition for the award of any contract or grant in excess of five thousand dollars by St. Charles County to a business entity (Firm), the business entity shall, by sworn affidavit and provision of documentation\*\*, affirm its enrollment and participation in a federal work authorization program (**E-Verify**) with respect to the employees working in connection with the contracted services. Every such business entity shall sign an affidavit affirming that it does not knowingly employ any person who is an unauthorized alien in connection with the contracted services. [RSMO 285.530 (2)]

An employer may enroll and participate in a federal work authorization program (**E-Verify**) and shall verify the employment eligibility of every employee in the employer's hire whose employment commences after the employer enrolls in a federal work authorization program. The employer shall retain a copy of the dated verification report received from the federal government. Any business entity that participates in such program shall have an affirmative defense that such business entity has not violated subsection 1 of this section. [RSMO 285.530 (4)]

Any entity contracting with St. Charles County shall only be required to provide the referenced affidavit on an annual basis. A copy of the affidavit is included in this Qualification request. Firms may choose to send the required documentation using one of the following options:

- Send the notarized affidavit and E-Verify MOU signature page to: St. Charles County, Attn: Purchasing Manager, 201 N Second Street, Room 541, St. Charles, MO 63301 prior to responding to any solicitations; **OR**
- Send the notarized affidavit and E-Verify MOU signature page along with a Qualification solicitation response.

These documents will be kept on file. The notarized affidavit and E-Verify MOU signature page will remain current for **one year** from the date of the notarized affidavit.

**\*\* PLEASE NOTE:**

***Acceptable enrollment and participation documentation consist of a valid copy of the signature page of the E-Verify Memorandum of Understanding, completed and signed by the Firm, and the Department of Homeland Security - Verification Division***

***The online address to enroll in the E-verify program is:***

**<https://e-verify.uscis.gov/enroll/StartPage.aspx?JS=YES>**

### **Veteran Friendly Employment Policy**

"Indicate whether you have developed a veteran friendly employment policy and, if so, attach a copy of such policy to your response as a point of information.

\_\_\_\_\_ "YES" our company has a veteran friendly employment policy.

\_\_\_\_\_ "NO" our company does not have a veteran friendly employment policy.

Please include a copy of your veteran friendly employment policy with your submission.

### **Open Records**

Any and all information contained in or submitted with the proposal becomes a public record subject to the Missouri Sunshine Law when a contract is executed, or all proposals are rejected. If Proposer believes that any information contained in or submitted with the proposal is protected by the Missouri Sunshine Law, Proposer must clearly identify what information Proposer believes is so protected and must also clearly identify the legal basis therefor.

**RFP 19-089  
REGIONAL ITS DATA SHARING INITIATIVE – PHASE 1  
CMAQ-7302(680)**

St. Charles County (referred to hereafter as County) seeks a qualified consultant to assist the County, Missouri Department of Transportation, and East West Gateway in creation of a regional ITS data sharing platform.

Proposals are due on **Friday, 08/09/2019 at 2:00 p.m.** local time to the following address:

Kurt Mandernach  
Purchasing Manager  
St. Charles County Government  
201 North Second St, Room 541  
St. Charles, MO 63301

Late proposals will be returned unopened. Five (5) copies of the proposal are required, one (1) is to be an original and so marked. Please also provide one digital copy of the proposal in Acrobat Portable Document Format (PDF) on CD or USB. **Faxed or emailed proposals will not be accepted.**

## 1. OVERVIEW

The COUNTY is requesting qualified vendors and interested PROPOSERS to provide a data warehouse solution as part of the design and initial deployment of the Regional ITS Data Sharing Initiative (RIDSi). St. Charles County in partnership with the Missouri Department of Transportation (MoDOT) and with support from East West Gateway (EWG), the St. Louis Metropolitan Planning Organization, will administer and manage the project.

In accordance with the St Louis regional ITS architecture, the RIDSi will serve as a central source and delivery point for historical and active event / transportation related information. The RIDSi will deploy a data warehouse that collects raw information from critical transportation partners; normalizes the information into a consistent format; and supports archive and delivery of the information back to the contributing partners and other approved agencies. From this central source an agency, firm, or regional partner can review, download, or develop their own analysis. The project's focus is to have regional transportation data and information be more widely available and used as a resource supporting planning, decision making, operations management, and incident response.

Initial project deployment, referred to as Phase 1, is envisioned to have a limited number of agencies both contribute and utilize archived information. However, the system is expected to expand in the future, with more partners agencies both contributing and using the available information.

### 1.1 Project Components

Three areas are part of the Phase 1 efforts. They include tasks related to the identification and standardization of communication sources and networks used to support data exchanges between regional agencies in a protected manner; the development of the data exchange used to centralize, normalize and support information sharing; and the services necessary to support traffic data collection and storage. These areas are broken down into the following efforts:

#### 1.11 Communications Platform

Identify network platform and standards to use for data and video exchange, leveraging off alternative platforms such as STARRS, regional fiber, new wireless components, or other available resources. This effort will define how transportation information is exchanged and coordinated between parties. The regional communications platform will enable deployment of a securely protected interagency data warehouse cloud.

#### 1.12 Incident Data Exchange

Implement real-time incident data feeds for sharing with regional partners. The exchange will standardize data on incidents from Illinois State Patrol, Missouri State Highway Patrol, county and local police and first responders and provide exchange capability using the network communications platform. It will incorporate transportation data from MoDOT, IDOT, mass transit, county, and municipality events.

This component will also identify functional and technology requirements for deploying and standardizing incident data exchange methods and interfaces, deploy the incident data exchange standards across the region, and (for future phases) identify how to automate data exchange.

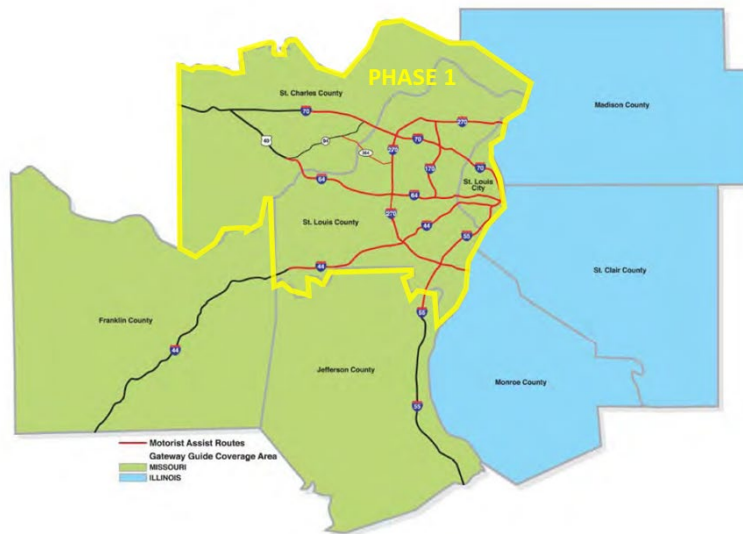
### 1.13 Archiving and Performance Assessment

Provide regional archiving of traffic data (including, as available, probe data) for review, performance assessment and visualization. This component will identify requirements on how to support and implement regional transportation archive function active operations and planning activities. It also includes storage of incident data, ability of correlating incident data with traffic data for the same time period, and archiving of performance and traffic volume information for use by any partner for planning activities.

## 1.2 Operational Region

The RIDSI project is envisioned to support the area covered by the St. Louis Transportation Management Center (Gateway Guide) in Missouri and adjacent counties in Illinois. However, Phase 1 will be limited to focus primarily on information and data sharing between St. Charles County and the Missouri Department of Transportation.

**Figure 1: RIDSI Phase 1 Project Area**



Future phases of the project undertaken by other entities will add information from other agencies and sources. The expected long-range vision will be for a system that serves the transportation and event data sharing needs of organizations throughout the greater St. Louis region.

## 2. INTRODUCTION

### 2.1 Purpose

The purpose of this Request for Proposal (RFP) is to solicit responses from qualified PROPOSERS to provide products and services necessary to successfully deploy a cloud based, data warehouse solution. The RFP process will evaluate the PROPOSERS qualifications, products, services, and make a selection recommendation. Recommendation acceptance by the COUNTY will allow a formal award to be extended to the successful PROPOSER.

### 2.2 Definitions

Common terms used in the RFP sections are defined herein and are intended to be consistent with best practices and those used in similar fields.

“PROPOSER” means individual, company or entity submitting a response in response to the RFP.

“CONSULTANT” shall be in reference to the successful proposer, once contracted.

“COUNTY” means St. Charles County, Missouri.

“RFP” means Request for Proposal and includes any attachments, exhibits; schedules or addenda considered to be a proposal and referred herein as response or submission.

## 2.3 Acronyms

The following acronyms are used in the RFP.

ATIS	Advanced Traveler Information System
ATMS	Advanced Traffic/Transportation Management System
ATP	Acceptance Test Procedure
C2C	Center-to-Center
CCTV	Closed Circuit Television
ConOps	Concept of Operations
COTS	Commercial off the Shelf
CPM	Critical Path Method
DMS	Dynamic Message Sign
DOT	Department of Transportation
FHWA	Federal Highway Administration
IEEE	Institute of Electrical and Electronics Engineers
IP	Internet Protocol
ISO	International Organization of Standards
ISP	Information Service Provider
ITS	Intelligent Transportation Systems
OSHA	Occupational Safety and Health Administration
RFP	Request for Proposal
RWIS	Road Weather Information System
TMC	Transportation Management Center
TMDD	Traffic Management Data Dictionary
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus
VCS	Video Control System
VPN	Virtual Private Network
XML	Extensible Markup Language

## 3. ADMINISTRATION INFORMATION

### 3.1 Pre-Proposal Meeting

In order to allow for an orderly discussion on the project and to assist PROPOSERS in their efforts to prepare their proposals and identify qualified DBE firms, A Pre-Proposal Video Conference will be held at **10:00 AM on Thursday July 11<sup>th</sup>**. Firms intending to submit Proposals as a prime consultant are strongly encouraged to attend the Video Conference. However, representatives of all firms interested in providing services for the project are encouraged to attend. Qualified DBE firms capable of providing project related services are encouraged to attend to become familiar with potential prime consultants.

Pre-registration for the Video Conference is required to provide all participants with instructions on how to log-in and participate in the conference. Pre-registration can be done at <https://www.sccmo.org/210/Gateway-Green-Light/RIDSI>. Participants may elect to attend the Video Conference in-person at MoDOT's St. Louis District Office, 1590 Woodlake Drive, Chesterfield, MO, 63017.

Following the Video Conference, a list of participants will be made available to all interested firms to facilitate networking between prime consultants and potential subconsultants, DBE firms, and suppliers.

Questions can be asked during the pre-proposal meeting; however, formal answers to those questions will be released in a subsequent addendum, which will serve as an official response.

### **3.2 Questions**

PROPOSERS are expected to raise any questions, exceptions, or additions they anticipate concerning the RFP. If there are any significant errors, omissions, or deficiencies in the RFP, the PROPOSER should respectfully request modification or clarification by the date noted.

## **4. PROJECT REQUIREMENTS**

### **4.1 Data Warehouse Overview**

The COUNTY is soliciting qualified PROPOSERS to provide a Data Warehouse solution. Both St Charles County, and the Missouri Department of Transportation along with support from East West Gateway will be primary users of the deployed solution. The deployed solution is anticipated to be expanded beyond these agencies over time and in later phases.

The data warehouse is anticipated to support a variety of informational sources as made available with a focus on the following:

- Video Images
- Emergency Response Assists
- Probe and Detector Data
- Incident Event
- Computer Aided Dispatch
- Transit Schedules and Events
- Local Special Events

The deployed solution is anticipated to be a cloud-based solution allowing for the collection of data from sources with the distribution and access of that information by third parties over the Internet and through popular web browsers including Chrome, Internet Explorer, and Safari.

The successful PROPOSER will provide design, procurement of technical resources/equipment, data normalization/cleansing, documentation, testing, training, and maintenance/warranty services for the data warehouse components.

A concept of operations was developed to provide further guidance on how the data warehouse may be used in the region. A copy of the ConOps can be found in **Exhibit A**.

## 4.2 Proposer Qualifications

### Minimum Qualifications

- Five (5) years in business supplying, deploying, and integrating, data warehouse related projects
- Three (3) similar successfully completed projects within the past 48 months
- Staff experience with product, software, or systems proposed has been greater than 24 months.

The PROPOSER will employ staff that is knowledgeable in performing activities to support all appropriate parts and phases of design, integration, deployment, testing, and training of the provided solution.

The PROPOSER shall list at least three (3) relevant projects with descriptions, dates when work was performed, services / products provided, and contact information for the client. Contact information may be used to verify project relevance and PROPOSER Qualifications.

### Disadvantaged Business Enterprise (DBE) Program

This project involves U.S. Department of Transportation (USDOT) federal financial participation and Missouri Department of Transportation (MoDOT) financial participation. It is the policy of USDOT and MoDOT that businesses owned by socially and economically disadvantaged individuals have an opportunity to participate in the performance of contracts utilizing federal funds. Consequently, the requirements of Title 49 CFR Part 26 (as amended) and MoDOT's implementing state regulations in Title 7 CSR Division 10, Chapter 8, "Disadvantaged Business Enterprise Program", will apply to this project.

Each contractor, subcontractor, and supplier working on this project shall take all necessary and reasonable steps to ensure that DBEs have an opportunity to compete for and participate in performance of the project. Any contractor, subcontractor, supplier, and DBE firm involved in the performance of this federal-aid project shall be aware of and fully understand the terms and conditions of the USDOT DBE Program.

MoDOT and other certifying agencies within Missouri have partnered to form the Missouri Regional Certification Committee (MRCC) and developed a Unified Certification Program (UCP) pursuant to 49 CFR 26 and 7 CSR 10. Only DBE firms certified by the MRCC are eligible to perform work on a federal-aid contract within Missouri for DBE contract goal credit. It is the contractor's responsibility to ensure firms identified for participation are approved certified DBE firms. The MRCC DBE Directory can be found at the following link: <https://www.modot.org/dbe-program>

The DBE participation goal for this project is **14%** of the total value of the contract.

The submitted Proposal should indicate how your firm will utilize a DBE firm or firms as part of your project team to achieve the DBE participation goal.

### Workforce Diversity

St. Charles County and its project partners are committed to reflecting the diversity of the community where this project is being implemented and it is expected that the selected firm is similarly committed to promoting and developing a diverse workforce.



The submitted Proposal should discuss your firm's approach to promoting, developing, and utilizing a diverse workforce. The Proposal should also indicate how your firm will assemble a well-rounded diverse project team to work on this project.

This project will require the selected firm to provide monthly reporting on the makeup of the project team performing the work.

#### On-The-Job Training (OJT)

This project will require the selected firm to provide on-the-job training (OJT) aimed at developing minority, women, and economically disadvantage individuals to effectively perform the various professional/technical Information Technology (IT) occupations required for the work. Incentives may be available to the selected firm to assist with OJT expenses.

The submitted Proposal should discuss your firm's approach to developing an OJT training curriculum and how your firm would utilize professional/technical IT trainees. The Proposal should also discuss how your firm would recruit professional/technical IT trainee candidates to participate on the project team.

## **5. SCOPE OF WORK**

The COUNTY plans to contract with a qualified PROPOSER to provide services and products necessary to create a data warehouse, from a variety of data sources, and make this data available to stakeholder groups.

The successful PROPOSER will provide the COUNTY a formal work plan detailing actions taken to bring about the proposed solution. The following services are anticipated to include but not limited to the following tasks, as part of the phase 1 activities.

### **5.1 Project Management**

The following outlines the required project management responsibilities the PROPOSER will provide during the course of the work.

**5.1.1 Project Manager** PROPOSER shall designate a single point of contact to act as the Project Manager. This individual will exhibit good management and communications skills. This individual will also be well educated regarding both general and working knowledge of the proposed solution and technologies to be used. They will be responsible for coordination between the COUNTY, MoDOT, local staff, and other parties involved with the deployment. The Project Manager will maintain project records and documentation. They should be able to supply the TMC with project related information within thirty-six (36) hours of it being requested.

**5.1.2 Schedule** PROPOSER shall submit a deployment schedule. The schedule shall show the anticipated critical path starting from the point of award through final acceptance testing.

**5.1.3 Project Kick-Off Meeting** The successful PROPOSER shall attend a project kick-off meeting to be held at a location predetermined by the COUNTY. The COUNTY

or its representative will coordinate the meeting location and agenda with the Project Manager. The PROPOSER is expected to document and provide a summary of the discussion to attendees within thirty-six (36) hours of the meeting conclusion.

- 5.1.4 Progress Meetings** Progress meetings will be requested or scheduled at regular intervals as designated during the kick off meeting. The meetings will be used to inform the COUNTY and MoDOT on progress made as well as coordinate upcoming project activities. Updates to the project schedule will be provided during these meetings. The PROPOSER is expected to document and provide a summary of the discussion to attendees within thirty-six (36) hours of the meeting conclusion.

## **5.2 System Design**

The following design tasks will be required of the successful PROPOSER and help refine the solution before deployment.

- 5.2.1 Data Source Review** The PROPOSER shall review samples of the data sources to be incorporated into the warehouse. Currently these will include transportation related data sources from St. Charles County and the Missouri Department of Transportation. Data expected to be in the initial warehouse includes but is not limited to the following: detector data from roadside and probe data from third parties, current construction / maintenance, incident, camera images (live/still), sign messaging, and emergency response assists. From the data source review the PROPOSER is expected to gain insight into how the data can be collected, normalized, stored, and distributed.

- 5.2.2 Data Normalization Procedure** PROPOSER shall provide the COUNTY with a plan on how they intend to cleanse and normalize the different data sources into a single central warehouse. The plan will provide guidance on how data attributes will be translated from their raw sources into the central accessible location. The TMDD will be used as a standard for data representation. The normalization procedures must be approved before work can be performed on agency data sources.

- 5.2.3 System Architecture** A system architecture showing a high-level layout of planned database table / structure to be created to support the collection, normalization, storage, and distribution of the information will be provide to the COUNTY for review.

- 5.2.4 User Interface / Experience Report** Examples of the interface and user experience that agencies will see as when accessing the data warehouse will be provided to the COUNTY for review. The user interface can be done in mock ups and will show how the proposed solution plans to meet the user system requirements outline in the RFP.

- 5.2.5 System Design Document** PROPOSER shall deliver a design document to be reviewed by the COUNTY and used to show how system requirements (**Exhibit B**) identified in the RFP, will be met as part of the formal deployment.

## **5.3 Storage and Archive Setup**

- 5.3.1 Establish Platform / System Setup** PROPOSER will establish the platform for the data warehouse, securing software, database licenses, hardware or any other

related elements necessary to establish the storage and information processing preparation necessary to deploy the approved solution.

- 5.3.2** Archived data will be stored for a period to be at least 5 years, although if not restricted by limitation on storage, or processing, longer durations would be desired.

## **5.4 Historical Processing**

The COUNTY will work with PROPOSER to provide historical data to help populate the initial data warehouse.

- 5.4.1** Historical Data Collection The bulk historical data will be provided to the PROPOSER on a storage device provided by the PROPOSER for this purpose.
- 5.4.2** Normalize Data The bulk historical data will be normalized, and quality checked as it is processed. Any significant error, omissions, or data gaps experienced during this process will be brought to the attention of the COUNTY to determine impact and how to proceed.
- 5.4.3** The PROPOSER is not to transfer, sell, or share bulk data with parties not associated with the project. Failure to comply with this requirement may result in immediate termination and potential legal action.

## **5.5 Current Data Processing**

Once the solution has been established and is ready to begin receiving live data from source agencies, the PROPOSER will begin processing current information and incorporating it into the centralized system.

- 5.5.1** Establish / Verify Source Connections PROPOSER will work with the partner agencies to verify that current source data can be accessed by the central system and verify that there is no communication or data loss present.
- 5.5.2** Quality Control Checking It is anticipated that the collection and normalization of the data will happen in an automated fashion; the PROPOSER will perform quality control checks at the time of processing / storage of live data to ensure consistency, with alerts when gaps or errors are encountered.

## **5.6 System Interface Deployment**

The PROPOSER will establish the user interface / experience as committed to during the design phase. Any changes to the proposed interface will be submitted to the COUNTY for approval before being installed. The following tasks are anticipated during the point in the deployment.

- 5.6.1** User Interface Deployment PROPOSER will deploy the user interface / experience as detailed during the design phase. As the interface is deployed the PROPOSER is encouraged to request initial system testers from the partner agencies to gain feedback on design and performance; prior to formal system testing.

**5.6.2** Privilege Service PROPOSER will deploy a user access and privilege services that prevents unauthorized access to the data and information offered through the warehouse. The PROPOSER will provide a document that shows how the privilege service works, and the different functions available to each service user level.

**5.6.3** Administrative Services Deployment The PROPOSER will deploy administrative tools and services that allow users with appropriate rights to add or remove users and review user/usage logs at a minimum.

## **5.7 Testing**

Once the data warehouse has been established and is ready for testing, the following tasks are anticipated.

**5.7.1** System Acceptance Testing Procedures Will be submitted by the PROPOSER detailing how each of the requirements in the "System Design Document" are to be tested and verified. It is anticipated that this document will be submitted two weeks before testing and incorporate any feedback and approval from the COUNTY before it can be executed.

**5.7.2** Perform System Acceptance Test PROPOSER will perform the testing over a period that is limited to three days in total. The PROPOSER shall be responsible for conducting and documenting the test results; testing will be done with at least one COUNTY representative present to verify outcome. Any steps that did not pass, or failed to verify the requirements, will be noted and reviewed by the COUNTY. The COUNTY may choose to waive a requirement for testing or request a different approach to testing that requirement.

**5.7.3** System Performance Review "Burn-In" Period The solution will run for a period of 45 days, with users encouraged to run reports and data retrieval as desired. Any issues or questions brought up by users will be shared with the PROPOSER and the COUNTY to determine if an issue exists, or if there are service changes needed. Ultimately this step is to stress the system to gauge its response to initial usage and user interaction. The PROPOSER shall be responsible for the maintenance of all equipment furnished and installed until final acceptance.

**5.7.4** Data Quality Check At the end of the Burn-In, a sample of data from each of the contributing agencies will be reviewed to verify that no gaps or issues in data quality occurred. If any significant gaps in information are noted, the COUNTY may require additional data reviews every two weeks until the quality and data consistency have been corrected.

## **5.8 Training**

Training shall be provided by the PROPOSER using qualified staff that has knowledge of the system components, software, and configuration deployed during the effort. The effort shall be conducted within two weeks of the system acceptance testing and be done under the following requirements:

**5.8.1 Training Session** PROPOSER shall prepare a training course for users and administrators of the system. The training course outline and materials shall be approved by the COUNTY before the session(s) are held. Training sessions shall be completed over two days. The first session will be for operators and focus on daily system use. The second session will be for administrators that will have to work with system configuration, maintenance, and troubleshooting. Each session will have no more than fifteen (15) participants. The PROPOSER shall provide all materials and instructors for the training.

**5.8.2** The COUNTY will provide a training location. The PROPOSER will provide all equipment, including but not limited to laptop, projector (may be available and should be requested), and or system hardware and software to be used during the session.

## **5.9 System Maintenance**

Ongoing support will be needed to ensure continued use of the PROPOSER provided solution. The following actions will be required.

**5.9.1 Regular Maintenance** PROPOSER shall be responsible for providing all software updates and/or upgrades for the products procured under this contract as part of the maintenance package. Responsibilities for storage, bandwidth, server software, or hardware needed to deliver system functionality are also considered covered by regular maintenance.

**5.9.2 Release / Maintenance Schedules** PROPOSER will provide the COUNTY and partner agencies written notice of pending new releases or planned maintenance dates and schedule to allow enough time for users to prepare for anticipated downtime. Maintenance should not impact data collection; there should be no gaps in data records do to scheduled efforts.

**5.9.3 Urgent Maintenance** Requests made by the COUNTY will be acknowledged and a response by the PROPOSER is expected within 24 hours. After identification or diagnosis of a problem, the PROPOSER shall provide the COUNTY the timeframe to complete any troubleshooting or corrections to address the request.

## **6. SYSTEM LICENSE**

The deployed solution will meet the following software licensing requirements:

- 6.1** The PROPOSER shall provide all software licenses necessary to operate the final deployment. The cost of the software and licenses include any COTS, or seats or other fees shall be included in the cost proposal.
- 6.2** The PROPOSER will provide a breakdown in how the license fee was calculated, will be supplied as part of the Cost Proposal
- 6.3** The PROPOSER shall provide the cost for adding additional licenses. For example, if licensing is based on a per user basis or capacity used; than the cost to add each

additional user or expand system volume shall be provided. This per unit price will be consider locked in over the course of the deployment and maintenance periods.

## **7. DOCUMENTATION**

The successful PROPOSER shall submit final documentation for the data warehouse elements necessary to properly document configuration, operation, and maintenance of the deployed system. Three (3) copies of each document will be provided as well as a digital file that can be distributed on the local shared network storage. The following is a list of documents are required for this project.

- 7.1** Logical Database Schema Documents how the data is being stored in the central database(s). Provides the logical view of the deployed solution, providing enough detail to help users understand how tables and views have been defined.
- 7.2** User Manual Shall describe how the system is operated; can also be provided as an online help document if preferred.
- 7.3** System Acceptance Testing Results The final results of the system acceptance testing shall be provided to the COUNTY as part of the project record.

## **8. PROPOSAL EVALUATION CRITERIA AND SELECTION**

The COUNTY intends to use an evaluation committee to conduct an evaluation of the Proposals received in response to this RFP. The evaluation committee will consist of members who have been selected because of their knowledge and special expertise of the services and/or products that are subject to this RFP. The PROPOSER may not contact members of the evaluation committee except at the COUNTY's request.

The Proposals will be initially reviewed to determine if they are in compliance with the guidelines and required proposal format as outlined within the Proposal Requirements section of this RFP. All Proposals will then be evaluated to determine if they comply with the minimum qualifications of the RFP. Failure to meet these prerequisites could result in the Proposal being rejected.

All Proposals that satisfy the RFP prerequisites will then be reviewed and scored against the evaluation criteria noted below. The evaluation committee reserves the right to review references, request interview presentations, and/or conduct demonstrations for short-listed Respondents as part of the evaluation process. The evaluation committee may also make adjustments to its initial scoring based on the additional or supplemental information obtained as part of any reference checks, the interview presentation, and/or product demonstrations requested.

All of this information will be used to tabulate a numerical final score using a point-rating and total score ranking system on the Proposals for consideration of potential selection and award. The COUNTY reserves the right to continue the evaluation of, and potentially select, any Proposal that most closely satisfies the prerequisites of this RFP.

<b>Proposed Solution, Evaluation Criteria</b>		
<b>No.</b>	<b>Description</b>	<b>Percentage</b>
1	Qualifications & Certifications as outlined in RFP	Pass/Fail
2	Capabilities and Staff Experience	10%
3	Project Approach (Quality of Hardware Systems and Displays and Quality of Software Solution)	45%
4	Work Plan/Schedule	20%
5	Security, Maintenance, & Support	15%
6	Workforce Diversity and On the Job Training	10%

## **9. PRESENTATION / DEMONSTRATION**

The COUNTY may request a presentation or demonstration of the highest scoring candidates. If requested, PROPOSERS shall be asked to discuss their solution, highlighting key areas of interest to the COUNTY. PROPOSERS can choose to run the proposed solution locally or to connect into a remote system and highlight desired functionality.

The COUNTY reserves the right to review initial proposal scoring and to make final adjustments based on the information provided during the demonstrations.

All costs associated with the demonstration will be incurred by the PROPOSER, the COUNTY will not reimburse these expenses.

## **10. COST PROPOSAL**

The COUNTY would request PROPOSERS provide pricing on the form provided in Exhibit C. Cost proposals will be submitted in an envelope, clearly labeled, and separate from the proposal documents. Projects scoring in the top tier of proposals based on qualifications will be further evaluated based on cost proposals. As part of the cost proposal, a separate document or sheet should be included that indicates how the licensing costs were calculated, and further indicates that pricing to purchase additional licenses if applicable. These prices will be firm over the term of the contract.

### **10.1 Basis of Payment**

Payment for the project will be based on successful completion of measurable objectives as identified in the cost proposal and with approval by the COUNTY. Payments for services will not be made in advance of work performed. A brief summary of the cost proposal items is below.

### **10.2 Project Management / Mobilization**

The basis for payment shall be lump sum and paid in two (2) installments. The first payment will be 50% for the bid item billable thirty days after the formal kick off meeting. The remaining 50% will be billable at the successful completion of the project, with acceptance of the system by the COUNTY and with the COUNTY's notification of the formal start to the maintenance period.

### **10.3 System Design**

The basis for the payment shall be lump sum and paid upon successful completion and approval by the COUNTY of the tasks necessary to properly review and perform the tasks under "system

design” in the scope of work. Submission and approval of the Data Normalization Procedure, System Architecture, User Interface, and System Design Document will form the basis for successful completion.

#### **10.4 Storage and Setup / Historical Processing**

The basis of payment shall be lump sum paid in two (2) installments and with approval by the COUNTY for completion of each task. The first installment will be 25% of the bid paid upon the successfully procuring the platform, services, and establishing the solution storage and initial system. The remaining 75% is paid after historical processing has been processed and migrated to the central database.

#### **10.5 Data Processing / System Interface Deployment**

The basis of payment shall be lump sum and paid upon the successful completion and approval by the COUNTY of the installation and configuration of the system interfaces needed to support current data processing from partner agencies. This will also include any configuration cost to develop initial interfaces and configure information user users access.

The basis of payment shall be lump sum and paid upon successful approval by the COUNTY of the system interface and initial data processing of current data form partner agencies.

#### **10.6 Testing**

The basis of payment shall be lump sum and paid upon the successful completion and approval by the COUNTY of all testing as detailed in the RFP. The item shall include all costs for developing and administering a system test procedure, system testing, 45-day test, and data quality check.

#### **10.7 Training**

The basis of payment shall be lump sum and paid upon the successful completion and approval by the COUNTY of all training as detailed in the RFP.

#### **10.8 Documentation**

The basis of payment shall be lump sum and paid upon the successful completion and approval by the COUNTY of all documentation as detailed in the RFP.

#### **10.9 Software License**

The basis of the payment shall be per license and paid upon the successful completion of the full system testing and approval by the COUNTY. The software licensing includes all cost for the software associated with the data warehouse functions as well as any licensing necessary for user access. Currently it is anticipated that there will be no more than fifty (50) users who simultaneously access the system.

#### **10.10 Maintenance and Support Year-1, Year-2, Year-3**

The basis of payment shall be lump sum and paid upon final acceptance of the solution in the first month of the start of the maintenance period with approval by the COUNTY. The COUNTY reserves the right to ask for a summary detailing the actions and activities taken by the PROPOSER over the previous maintenance period for tracking and record keeping purposes.



## 11. PROPOSAL REQUIREMENTS

A PROPOSER shall provide four (4) paper copies and one (1) proposal marked as "ORIGINAL". Along with these documents the PROPOSER shall also provide one digital copy of the proposal in Acrobat Portable Document Format (PDF) on CD or USB. Any proposal package or envelope submitted after the due date and time will not be considered. The guidelines of this RFP submittal and required proposal format are listed below. The Proposals shall be no more than 30 pages submitted on 8 ½" x 11" paper using a font no less than size 10 (excluding charts, graphs, tables, and other visual exhibits) and standard margins with identifiers or tabs separating the major sections of the Proposal.

Proposal tabs should be as follows:

- Cover Letter
- Introduction
- Project Approach
- Work Plan
- Security
- Maintenance and Support
- DBE, Workforce Diversity, and OJT Plan
- Appendix A: Resumes/Certifications
- Appendix B: Product / Solution Materials (optional)
- Appendix C: Sample Maintenance Plan (optional)

### 11.1 Cover Letter

Letter on the firm's letterhead transmitting the proposal to the COUNTY, and signed by an authorized person, include the firm's contact and information on how to reach this person should questions by the COUNTY be necessary.

### 11.2 Introduction

The section will provide an overview of the PROPOSER and their qualifications. As part of this section provide the following:

- Description of the PROPOSER; history, company size, experience, etc
- Project Manager name, contact information, summary of qualifications
- Project team structure and organizational chart; include any sub-consultants or vendors that may support the project
- List of key staff to work on the proposal with brief descriptions; attach formal resumes and product certifications for staff members listed in the proposal's appendix
- Brief description of three similar deployments in the last 48 months; include contacts, dollar values, location, technology/systems deployed, and installation dates

### 11.3 Project Approach

The Section will provide an overview of the technology and solutions to be deployed to support the requirements of the RFP; include the following in the proposal:

- Describe the proposed solution its advantages, and how it meets the requirements of the RFP; its capabilities and possibilities for future expansion

- Provide a description of any hardware and equipment to be procured as part of the solution, include a basic description of each and include product cut sheets in the proposal's appendix
- Describe any commercial off the shelf software that will be used to support the deployment (eg Java, SQL Server, etc)

#### **11.4 Work Plan**

Under this Section, the PROPOSER will provide a summary of how they will design, deploy, configure, test, train, and maintain the proposed solution.

- Provide a work plan that will describe how the PROPOSER will successful approach meeting the requirements of the RFP
- Provide a preliminary project schedule
- Identify any critical actions that will be required of the COUNTY to ensure a successful deployment
- Identify any challenges or anticipated issues that the COUNTY should be aware of that might impact the PROPOSERS ability to complete the work as specified
- Identify any assumptions that were made in preparing the work plan

#### **11.5 Security**

Under this Section, the PROPOSER will provide a summary of how they will account for securing data and information.

- Provide a brief overview of how data will be secured from unauthorized outside access
- Describe how data access and user actions are to be logged; and retrieved
- Identify any challenges or anticipated issues that the COUNTY should be aware of that might impact the PROPOSERS ability to securely handle the data and information to be used as part of the effort

#### **11.6 Maintenance and Support**

The Section will cover how the PROPOSER handles maintenance and service for the provided solution and related hardware; include the following in the proposal:

- Describe how support calls are received, tracked, and any reports that are provided to the client to show how the issues have been resolved
- Describe the recommend regular maintenance that will be needed for the deployed solution
- Describe how software will be maintained through the maintenance period; detail how a typical maintenance update would be performed

#### **11.7 DBE, Workforce Diversity, and OJT Plan**

The Section will cover how the PROPOSER will address DBE program requirements, Workforce Diversity, and OJT Training; include the following in the proposal:

- Describe how your firm will utilize a DBE firm or firms as part of your project team to achieve the DBE participation goal.
- Describe your firm's approach to promoting, developing, and utilizing a diverse workforce. Also describe how your firm will assemble a well-rounded diverse project team to work on this project.
- Describe your firm's approach to developing an OJT training curriculum and how your firm would utilize professional/technical IT trainees. Also describe how your

firm would recruit professional/technical IT trainee candidates to participate on the project team.

### **11.8 Appendix A: Resumes / Certificates**

Place full resumes of critical staff that will be assigned to the work under this section. Resumes should be kept to no more than two (2) pages per individual. Also include, if applicable any software or product certifications, training credentials, or other materials that demonstrates competence of the staff to provide installation, configuration, and support of proposed solution.

### **11.9 Appendix B: Product / Solution Materials (optional)**

Screen shots, technical overviews, or other visual representations of the products, software, or services should be placed in this section. This is not a required section; a PROPOSER may choose not to provide this information. If provided should be no more than five (5) pages in length.

### **11.10 Appendix C: Sample Maintenance Plan (optional)**

Provide a sample maintenance plan that details how support will be initialized, tracked, and executed. This is not a required section; a PROPOSER may choose not to provide this information. If provided should be no more than five (5) pages in length.

## **12. DISCLAIMER**

This RFP is for information and planning purposes only. The COUNTY will not be liable for any costs incurred by PROPOSERS to prepare a submission, or any related follow-up (e.g., interview, demonstration, etc.). The COUNTY reserves the right to reject and/or accept any and all proposals in whole or in part. Furthermore, the COUNTY reserves the right, at any time and for any reason, to cancel this RFP or any portion thereof, or to accept an alternate proposal.

In addition, the COUNTY reserves the right to waive any immaterial defect in any proposal or to seek clarification from a PROPOSER at any time; a PROPOSERS failure to respond promptly is cause for rejection. Furthermore, the COUNTY, reserves the right to negotiate supplemental terms and conditions, as necessary or appropriate, to accomplish the intent of this RFP.

Proposal materials submitted will become the property of the COUNTY and cannot be returned. Proposal shall remain valid and in effect for a period of one hundred and twenty (120) days after the due date. The COUNTY may also require submission of best and final offers at its discretion.

### **Exhibit A: Concept of Operations (attached)**

### **Exhibit B: System Requirements (attached)**

The requirements specified herein, represent a basis for desired solution functionality. The requirements do not support any vendor solution or product; they provide guidance on what functions the system is anticipated to perform. These requirements shall be fulfilled by the selected PROPOSER as part of their deployed solution.

## Exhibit C: Cost Proposal

**Project Management / Mobilization**

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**System Design**

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**Storage and Setup / Historical Processing**

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**Data Processing / System Interface Deployment**

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**Testing**

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**Training**

---

**Documentation**

---

**Software License**

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**Maintenance – Year 1**

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**Maintenance – Year 2**

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**Maintenance – Year 3**

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**TOTAL PROJECT COST**

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### **Exception Sheet**

If the item(s) and/or services proposed in the response to this Request for Proposals is in any way different from that contained in this Request for Proposals, the Firm is responsible to clearly identify all such differences in the space provided below. Otherwise, it will be assumed that the Firm's offer is in total compliance with all aspects of the proposal or Qualification.

Below are the exceptions or differences to the stated specifications (attach additional sheets as needed):

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

**THIS FORM MUST BE COMPLETED AND ENCLOSED WITH THE QUALIFICATION**

**Audit Clause for Contracts**

**Examination of Records**

The Firm's records must include, but not be limited to, accounting records (hard copy, as well as computer readable data), written policies and procedures, sub-consultant files, indirect cost records, overhead allocation records, correspondence, instructions, drawings, receipts, vouchers, memoranda, and any other data relating to this contract shall be open to inspection and subject to audit and/or reproduction by the County Auditor, or a duly authorized representative from the County, at the County's expense. The Firm must preserve all such records for a period of three years, unless permission to destroy them is granted by the County, or for such longer period as may be required by law, after the final payment. Since the Firm is not subject to the Missouri Sunshine Law (Chapter 610, RSMo), information regarding the Firm's operations, obtained during audits, will be kept confidential.

The Firm will require all sub-consultants under this contract to comply with the provisions of this article by including the requirements listed above in written contracts with the sub-consultants.

**Firm Information**

Company Name: \_\_\_\_\_

Business Address: \_\_\_\_\_

Business Hours: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Email address: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Authorized Signature: \_\_\_\_\_  
(Indicates acceptance of all Qualification terms and conditions)

Date: \_\_\_\_\_

## **AFFIDAVIT OF WORK AUTHORIZATION**

The Firm who meets the section 285.525, RSMo definition of a business entity must complete and return the following Affidavit of Work Authorization.

Comes now \_\_\_\_\_ (**Name of Business Entity Authorized Representative**) as \_\_\_\_\_ (**Position/Title**) first being duly sworn on my oath, affirm \_\_\_\_\_

(**Business Entity Name**) is enrolled and will continue to participate in the E-Verify federal work authorization program with respect to employees hired after enrollment in the program who are proposed to work in connection with the services related to contract(s) with the County for the duration of the contract(s), if awarded in accordance with subsection 2 of section 285.530, RSMo. I also affirm that \_\_\_\_\_

\_\_\_\_\_ (**Business Entity Name**) does not and will not knowingly employ a person who is an unauthorized alien in connection with the contracted services provided to the contract(s) for the duration of the contract(s), if awarded.

In Affirmation thereof, the facts stated above are true and correct. (The undersigned understands that false statements made in this filing are subject to the penalties provided under section 575.040, RSMo.)

\_\_\_\_\_  
**Authorized Representative's Signature**

\_\_\_\_\_  
**Printed Name**

\_\_\_\_\_  
**Title**

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**E-Mail Address**

Subscribed and sworn to before me this \_\_\_\_\_ of \_\_\_\_\_. I am  
(DAY) (MONTH, YEAR)

commissioned as a notary public within the County of \_\_\_\_\_, State of  
(NAME OF COUNTY)

\_\_\_\_\_, and my commission expires on \_\_\_\_\_.  
(NAME OF STATE) (DATE)

\_\_\_\_\_  
**Signature of Notary**

\_\_\_\_\_  
**Date**

# EXHIBIT A

## Missouri Department of Transportation Regional ITS Data Sharing Initiative

### Concept of Operations

Prepared for:



Missouri Department of Transportation - St Louis District  
14301 South Outer Forty  
Chesterfield, MO 63017

Prepared by:



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Suite 1200  
Nashville, TN 37219

**February 10, 2019**  
**Version 1.2 (v1g)**



### Document Revision History

Revision #	Date	Purpose
1.0	Nov-7-18	Initial draft outline
1.1	Jan-24-19	Client comments and feedback
1.2	Feb-10-19	Incorporate comments

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## Introduction

The Missouri Department of Transportation and Saint Charles County, with support from East West Gateway, are moving forward with the preliminary design and initial deployment of a Regional ITS Data Sharing Initiative (RIDSi). In accordance with the St Louis Regional ITS architecture, the RIDSi is a Data Warehouse that will serve as a centralized source and delivery point for historical and active event and traffic information.

The RIDSi is acting as a data warehouse will collect raw information from critical transportation partners, then normalize the information into a consistent format; standardized to allow the information to be more easily accessed and analyzed. The information becomes available as a resource to support planning, decision making, operations management, and incident response by agencies in the region.

The initial phase of the project involves efforts to identify technology, standards, and system architecture to be used in collecting regional traffic and incident information from source agencies into a single central data source (warehouse). From this central source an agency, firm, or regional partner can review, download, or build applications using the centralized information.

## 1 Service Overview

### 1.1 Project Components

Three areas have been identified as part of the Phase 1 efforts. They include tasks related to the identification and standardization of communication sources and networks used to support data exchanges between regional agencies in a protected manner; the development of the data exchange used to centralize, normalize, and support information sharing; and the services necessary to support traffic data collection and storage. Each is explained in further detail herein.

#### **Regional Transportation Communications Standardization Platform (RTCSP)**

Provide a network platform for standardization of data and video exchange, leveraging off alternative platforms such as STARRS, regional fiber, new wireless components, or any available source. RTCSP will define a regional transportation information exchange and coordination coalition and a regional communications platform enabling development of a securely protected interagency data cloud.

#### **Regional Incident Data Exchange (RIDEX)**

Implement real-time incident data feeds for sharing with regional partners. RIDEX will standardize data on incidents from ILSP, MSHP, county and local police and first responders and provide exchange capability using the above RTCSP infrastructure. It will incorporate MoDOT, IDOT, mass transit, county, and municipality event entry and information access.

This component will also identify functional and technology requirements for deploying and standardizing incident data exchange methods and interfaces through RTCSP, deploy the incident data exchange standards across the region, and (for future phases) identify interface modules to allow for automated data exchange between agencies.

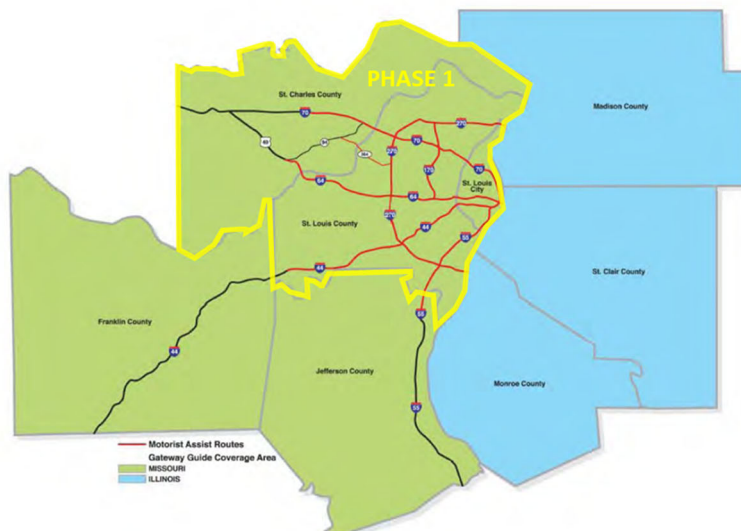
### Transportation Archiving and Performance Assessment System (TAPAS)

Provide regional archiving of traffic data (including, as available, probe data) for review, performance assessment and visualization. This component will identify requirements and prepare procurement documents for TAPAS and implement regional transportation archive function to be used for CMP and other planning activities. TAPAS will also include storage of incident data, ability of correlating incident data with traffic data for the same time period, and archiving of performance and traffic volume information for use by any partner for planning activities.

## 1.2 Operational Region

The RIDSI project is envisioned to support the area covered by the St Louis Transportation Management Center (Gateway Guide) in Missouri and adjacent counties in Illinois. However, Phase 1 will be limited to focus primarily on information and data sharing between St Charles County and the Missouri Department of Transportation.

Figure 1-1: RIDSI Phase 1 Project Area



Future phases of the project will add information from other agencies and sources. The expected long-range vision will be for a system that serves the transportation and event data sharing needs of organizations throughout the greater St Louis region.

## 1.3 Informational Sources

The data and information to be made available through the project impacts how the system is utilized. The following are preliminary data and information sources being reviewed as part of the phase 1 project deployment.

### Video Images

Standard and High Definition video image data available as “live” or “current” condition; with appropriate user privileges. Image snapshots available as alternative. No recording for historical analysis is planned; storing of snapshot views may be considered in the future.

### Emergency Response Assists

Emergency Response assists will be achieved to store information on each stop including but not limited to locations, event type, event characteristics, responder, lane impacts, and total time.

### Probe and Detector Data

Data generated through roadside detection and collection hardware reporting transportation volume, speed, and occupancy will be available. Probe data or traffic subscription services will need to be evaluated to determine contractual limitations and future availability, if available speed and travel time data is planned.

### Incident Event

Extensive information on location, type, lane impact, severity, clearance time, hazard, number and type of vehicles involved, and current responders on scene will be available. Potentially adding in weather and roadway conditions as additional variables will be reviewed in the future.

### Computer Aided Dispatch

Support for regional dispatching information will be reviewed with the potential to add in events that have transportation related impacts collected in future project deployments. Sources of this data may be generated by local, regional, and state law and safety agencies and require standardizing data collection and reporting requirements.

### Transit Schedules and Events

Metro events will be reviewed for potential inclusion; special event support, and planning for emergency contingency / alternate route identification being identified and stored. Daily ridership, route schedule and support will also be discussed with potential partners.

### Local Special Events

Identification of major trip generators including large capacity sports stadiums, college arenas, entertainment venues, and recreational centers with attendance over 10,000 will be incorporated as information on event dates can be secured. Major festival and celebrations will also be identified for potential inclusion as reliable and consistent sources of information are identified or made available.

Figure 1-2: PIDSI Sources



## 1.4 Stakeholders

Initial project deployment is envisioned to have a limited number of agencies both contribute and utilize archived information. However, the system is expected to expand with more partners agencies both contributing and using the available information. Potential participating agency stakeholders are defined as Critical Partners (supported by initial project); Near-Term Partners (supported in the next 1-3 years), and Future Partners (supported in the next 3+ years).

### *Critical Agencies*

The primary users and data sources for the initial data warehouse effort, these agencies have already been part of some core collaborations in recent years, most notably with the Gateway Green Light project. Camera images, incident events, and detection data are already being shared at a basic level; but not available except to those directly connected to existing shared software platforms such as the Advanced Transportation Management Software (ATMS) and Traffic Control System (TCS). These software packages operate freeway and local arterial field assets. The following agencies are the critical partners for the initial data warehouse effort; along with a list of potential departments within these organizations recognized as utilizing available information:

#### **Missouri Department of Transportation**

- TMC Operations
- Traffic Operations
- Planning

#### **St Charles County Transportation Department**

- Transportation Department
- Planning

#### **East-West Gateway Council of Governments**

- STARRS
- Transportation Planning

### *Near-Term*

Although not seen as critical partners for the first stage of deployment, these agencies may indirectly benefit from initial project efforts. They may become potential data sources for expanded system functions and capabilities.

#### **Gateway Green Light Partners**

- City of Cottleville
- City of Dardenne Prairie
- City of Lake Saint Louis
- City of O'Fallon
- City of St. Charles
- City of St. Peters
- City of Weldon Spring
- City of Wentzville

#### **Regional Transportation Partners**

- City of St Louis

- St Louis County
- Illinois Department of Transportation

#### Public Safety Organizations

- St. Louis Metropolitan Police Department
- St Louis County Police Department
- Missouri State Highway Patrol

#### University / Research Organizations

- St Louis University
- University of Missouri - Columbia

#### Future Partners

As the RIDSI data warehouse project evolves past its initial phase, additional agencies are likely to desire access and become contributing members. These agencies are seen as future partners.

#### Transportation Agencies

- Lambert International Airport
- Metro

#### Additional Public Agencies

- Other local Fire, Law, and Safety Organizations

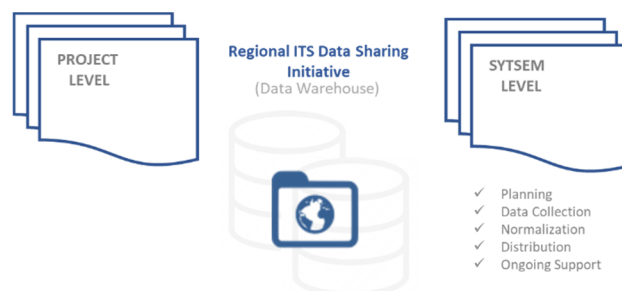
#### Third Party / Private

- Local Media
- Social Media Providers
- Internet Service Provider / Mobile Media providers
- In Vehicle Media providers
- Traveling Public
- Consulting Firms

## 2 Service Objectives

Phase 1 goals and objectives are centered around establishing the initial data warehouse deployment. Goals for the project initial deployment and future stages are categorized as “project” and “system” level.

Figure 2-1: RIDSI Goals / Objective Categories



## 2.1 Project Level

Project based objectives focus on desired benefits of the system to users and regional partners. These objectives include organizational and performance improvements, as well as better communications and data utilization. The following are a list of project level goals and objectives for the RIDSI:

### **Goal A: Foundation for Improved Decision Making**

The data warehouse will support better decision making by allowing users to identify historical trends, current impacts, or better reporting and visualization of existing data sets to determine patterns that support more cost-effective resource management.

### **Goal B: Stored Information More Accessible**

Make sources of information currently stored by users more accessible by outside users, with tools and reports that are easy to use. Results to queries are generated with very low to no wait time by users.

### **Goal C: Improving Integration**

Make data in varied systems that is formatted differently and in ways that are not readily usable more searchable and reachable. Integration of these various sources into a single location will allow agencies in the region to better integrate and support operational efforts such as reduce impacts of incidents and congestion.

### **Goal D: Speeding Up Response Times**

Have tools to help analyze current system and operational performance leading to reduced response times. Information is provided in a single location rather than over multiple varied sources.

### **Goal E: Faster and Flexible Reporting**

Data stored in the warehouse will allow users to perform interactive tasks generating reports quickly or provide a means to download data for more user centric data analysis. The tool will be useable for a range of users, from the casual daily operator to the data focused researcher.

### **Goal F: Improved Data Quality**

The quality of available data shall improve as users become more reliant on its availability, leading to better quality control during the time the information is generated.

### **Goal G: Reduce Burden on IT Resources**

With storage and reporting now being handled by a single vendor, the demand on individual IT department staff should decrease.

### **Goal H: Improve Regional Cooperation**

The desire for data and the need to collaborate to ensure sources of information are accessible will encourage an increase in regional cooperation that moves beyond the initial Phase 1 participants, to include a wide range of public safety and private agencies in the future.



## 2.2 System Level

System level goals and objectives are mapped to the various project deployment stages, which include planning, collection, normalization, distribution and support. Each area has a set of desired goals and priorities to assist in focusing project requirements.

### *System Planning*

System planning is the process of formalizing a design and implementation strategy for the regional data warehouse. Goals and objectives during this stage of the project include but are not limited to the following:

#### **Goal 1.A: Agency Involvement**

The initial system design, will have participation and take guidance from critical stakeholders, identified at this time as Missouri Department of Transportation, St Charles County, and East West Gateway. These agencies will work with the selected data warehouse vendor to provide guidance on final design and system characteristics throughout phase 1 and future phases.

#### **Goal 1.B: System Governance**

A formalized governance document will be drafted to help provide guidance to agencies that participate in the initial and future system deployment. The document forms an agreement that helps detail out data ownership, data accuracy, and how the project is administered as more agencies seek future access.

#### **Goal 1.C: Open Standards**

The project will identify and utilize open standards and open source solutions, as feasible; to prevent dependence on proprietary products. For situations where this is not feasible the partner agencies will provide guidance on acceptable standards and / or products to be used.

#### **Goal 1.D: System Architecture**

The system architecture is intended to be structured to allow for flexibility in the types of data sources that can be used, have a path for future expansion (quantity and distribution of data), and allow for user accessibility. Vendors will be providing a preliminary vision of the proposed system architecture during the selection process that will be used as a point of discussion on how these objectives will be met in the initial and future phases.

#### **Goal 1.E: Data Mapping**

The selected vendor will be provided data sources to be incorporated into the phase 1 deployment; as part of their planning activities, the vendor will provide how each data source will be mapped and normalized for final distribution; these plans will be signed off by critical partners before work begins.

### *Data Collection*

Raw data sources that contain information on incident, images, or other variables will be available to the data warehouse vendor. The goals and objectives during this stage of the process focus on determining how best to assemble and gather the available information, while ensuring the sources of data are not negatively impacted by the collection process.

**Goal 2.A: Data Quality Analysis**

Data collected and normalized for the project will be evaluated for gaps, inconsistencies, or errors that may impact its utility by users. If data errors occur, both in the initial database population and later data integration, there will be a way for the system to identify and alert the source of the errors so that they can be corrected in a timely manner.

**Goal 2.B: Collection Frequency**

The system will provide a way for ongoing data collection to be done on a continuous basis or at intervals that are acceptable to the agency providing the data. Collection frequency will be done in way to avoid excessive expense or negative impacts to partner facilities or networks.

**Goal 2.C: Source Security**

Access to partner source data, will be done in a way to protect agencies from outside incursions by unauthorized parties, or the corruption of stored data. Data backup and recovery will also be part of the vendor's security efforts.

*Normalization*

Taking raw data variables and information and translating it into consistent elements that are more easily made viable for searching and reporting purposes are the focus of normalization efforts. Under these efforts, goals and objectives look at how to ensure accuracy and documentation of the effort.

**Goal 3.A: Data Accuracy**

Initial data collected from agency sources will be checked throughout the normalization process at a frequency agreed to by the partner agencies to ensure issues can be identified and resolved, before each round of additional data sources are integrated into the warehouse.

**Goal 3.B: Schema documentation**

The normalized data schema will be documented so that third party agencies will know what information is available and to build third party applications to take advantage of the stored data. The documentation would also allow for a different vendor to continue supporting the project should the initially selected vendor no longer become viable during a later time of the project.

**Goal 3.C: Agency Ownership**

Ownership of the data, both raw and normalized, remains with the source agency. Information and data collected remains the property of the individual agencies. Data and information are not to be transferred or shared with third parties without an expressed written agreement, and/or acceptance of agreed to terms and conditions by the original owning agency.

### *Distribution*

End users are focused on processing timely requests and have access to data in a timely fashion. Goal and objectives for the project distribution stage focus include these areas:

#### **Goal 4.A: Viable Single Source Environment**

Become a single source data environment for transportation related information; providing query, analysis, and reporting tools that provide cost saving and ongoing regional benefits to initial and future project partners.

#### **Goal 4.B: Frequency**

Data should be updated for users in a timely manner. A timestamp indicating last information update should be used to help identify when data was generated.

#### **Goal 4.C: Availability**

Information in the data warehouse environment will be accessible through a single “point-of-entry, over the internet. The storage location of the physical data will be transparent to an end user, who should see the data from public networks, and not require tunneling into a private intranet.

#### **Goal 4.C: Usability**

Data will be consistently formatted; data visuals and representations should be easily discerned by the user. Tools and queries should be performed in less than 30 seconds and if an action takes longer, the user should be notified of both the expected amount of time to perform the task, as well as any current progress on the task.

#### **Goal 5.D: Visualization**

Data should be presented in a dashboard or visual view as much as reasonable. Critical events, information, or important system notifications such as downtime for maintenance should be shown in a visual manner to ensure users are properly notified.

#### **Goal 4.E: Access and Privileges**

All data collected from source agencies will not be shared to third parties not approved by the partner agencies. Data should also be available to download in a CSV, XLS, or PDF depending if the user has an appropriate level of access.

#### **Goal 4.F: Administration**

The system will allow for partner agencies to have administration over users and data; level and features of that administration will be part of the solution proposed by the vendor.

#### **Goal 4.G: Data Security**

Data backup and recovery are a central part of this goal. A vendor will have a way to recover from a partial or large data, communication, or hardware impact in a way that is seamless to end users.

### Ongoing Support

To ensure investments in the warehouse are realized by partners and regional users the following ongoing support goals and objectives have been identified.

#### Goal 5.A: Training

System Administration and User Training shall be provided in online step by step procedures for common tasks that can be used by an individual to learn and review as needed.

#### Goal 5.B: Documentation

Online help system will allow for users to access instructions for more detailed tasks; digital manuals that are easy to access and distribute will also be available for offline review when a user is not directly connected to the system.

#### Goal 5.C: System Maintenance

Regular maintenance will be performed, and release notes generated for users to assist them in understanding any changes or status of pending system improvements being made.

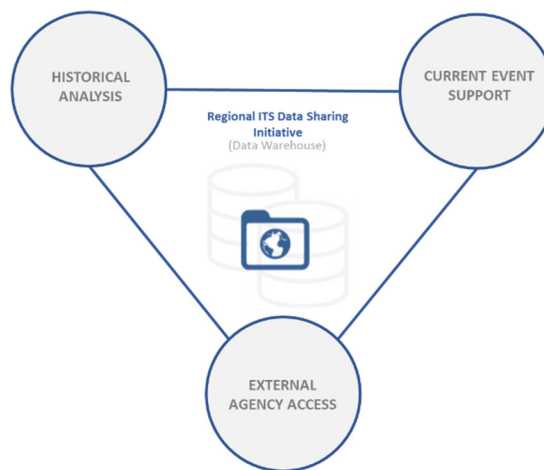
#### Goal 5.D: User Communications

User communications on current system status, critical events, or regular scheduled maintenance shall be distributed through text or email. Different groups of users will be developed with communications scope and frequency to each group adjusted to meet the needs of its users.

## 3 Operational Scenarios

The following are list of potential scenarios where the RIDSI could support critical partners or other parties through the project deployment.

Figure 3-1: RIDSI Operational Scenarios



### 3.1 Historical Analysis Scenarios

Situations under this category focus on how access to achieved data ranging from a few months to several years; can be utilized once the data warehouse is deployed.

#### *Scenario: Transportation Research and Planning*

Better understanding impacts to commercial, environmental, safety, and mobility is a desired result. Having a single source of transportation related data, including travel time, speed, and incident information would allow a department, major university, or a transportation research center to request, receive, and analyze data that can help better understand cause and effect relationships for both past and recent regional events. Possible examples that may be supported under this scenario include:

- A major university uses the warehouse to retrieve historical information on a corridor that has recently added lanes. Using the information, they can perform before and after analysis that determines how safety has been impacted utilizing the number and severity of crashes before and since the new lanes were added as one of the metrics.
- Historical data is used to determine how a recent 3-day flooding event impacted travel and potential economic loss for the region impacted. Historical traffic volume data was pulled over the same period which flooding recently occurred, then used in an economic model to determine lost revenue for the impacted region.

#### *Scenario: Roadway Network Performance*

Managing the performance of the regional transportation network is a priority of the Transportation Management Center and other regional partner agencies. Emergency situations can arise quickly and unexpectedly.

Agencies have tools in place to support decision making during critical situations including procedures based on best practices and formal policies. These guide staff on steps and type of responses to initiate for given events. The data warehouse adds another tool that allows for a historical basis to support decision making during these events. Possible examples that may be supported under this scenario include:

- An event closes two lanes of traffic near a major intersection, using the data warehouse operations center, staff retrieve events of a similar type, for the current event location. Information allows staff to determine potential impacts to be expected, before they occur. Having historical information on potential queue length, reported secondary events, and typical amount of time to clear past events, allows them to be more proactive in both the event assessment and response stages.
- To reduce winter weather travel impacts, the operations center retrieves incident data on the previous season's worst snow events and identifies locations on the roadway network that saw the more frequent occurrence of incidents during snowfall. Using this information, the management center works to create an information campaign meant to alert the traveling public of the most highly impacted locations during winter conditions, to encourage alternate route planning or trip scheduling to avoid these areas during the upcoming winter season.

### *Scenario: Data Visualization*

Information presented in ways that allow for easier recognition of trends and analysis is vital to quicker response. Visualization of data also supports better communications as it assists in distilling more complicated information into a format more easily understood. The warehouse project can support easier data visualization by normalizing the data from various agencies into a format that can readily be converted into charts, graphs, or tables for hourly, weekly, monthly, or yearly reports. Possible examples that may be supported under this scenario include:

- Management for the Motorist Assist program uses the warehouse to pull quarterly information on number of assists done over the period; providing a report to senior management that shows graphs on type of assists and total time spent on scene as part of an ongoing performance evaluation of the program's success.
- A traffic engineer is tasked with determining how DMS messaging is being utilized on a specific freeway corridor; management wants to know what percentage of the messaging is "high impact" (incident related) verses informational (all other messages) for the past 12 months. The engineer using the warehouse pulls data on all events for the specific corridor and generates a chart for the DMS locations showing the amount of time each has been used for "high-impact" messaging over the requested period.

## 3.2 Current Event Support Scenarios

Events under this category showcase how access to current "live" data through the warehouse could be utilized to better support cooperation and information exchange between partners and interested parties.

### *Scenario: Live Event Information*

Having access to real time or "nearly" live data is helpful in the coordination of resources, responses, or information dissemination, to keep agencies engaged and informed on progress being made for an ongoing event. Possible examples that may be supported under this scenario include:

- A weather event is moving through the region; however, it is happening after the PM peak period. As the weather event unfolds, information pushed to the data warehouse is disseminated to partner agencies who see that the weather is not having any increased negative impacts to travel times or crashes; thus, anticipated impacts to their operations will be minimal.
- Local sports venue attendees are leaving a game early; travel time detection and camera images seem to point to an increase of traffic along a major freeway at the same time commuter traffic is also expected to begin. Through the warehouse traffic images are shared with local partner agencies who use the information to start taking actions to mitigate impacts to local streets and help flush the additional that is expected due to expected increased delays on the freeway.
- A major traffic incident has occurred that will impact freeway and / or local traffic for a measurable period. Through the warehouse, incident information is actively sent to appropriate law and safety agencies to alert them of a developing event that may impact them based on proximity to their jurisdiction, or location of previously stated interest. In this manner the

warehouse does not have to be actively used, but instead is a means to help agencies sign up and receive notification of events of interest.

#### *Scenario: Existing Operations Visualization*

Taking access to current event data and converting this information into a visual form by the agency or the warehouse interface further focuses attention on critical aspects of events that can improve response time and coordination. Possible examples of how this scenario may be supported by the project include:

- Using data from the warehouse an agency creates an internal ESRI map that highlights current regional crashes, number of lanes impacted, and response status. On that same map, the agency overlays work zone and local event venues information also pulled from the data warehouse. The information is used to provide an operational assessment of regional events near the agency's jurisdiction; highlight those events that might have impacts to their local street network.
- Travel time data provided by the warehouse is used by a local transit authority to generate an internal dashboard that highlights their current bus routes in green, yellow, and red, depending if a corridor is operating at free flow, or starting to experience slowing traffic conditions. The near real time information provides them a tool to help determine if buses on-time performance are being impacted by outside factors or internal issues they can control.

#### *Scenario: Work Zone / Maintenance Impact*

Having access to information on emergency maintenance activities or ongoing work zones may provide partner staff a better understanding or how current events are impacting their networks; leading to quicker response and adjustments to their operational strategies. Possible examples under this scenario might include:

- A local traffic engineer is getting complaints on a signal not have enough green time with complaints of much longer than usual wait times. The engineer can see that local detectors are reporting higher than usual volume but doesn't know the cause. Using the data warehouse, they identify that an emergency maintenance effect in a nearby jurisdiction is causing traffic to take an alternate route that is impacting their signal's performance. They make changes to the signal and continue to monitor the intersection through the duration of the maintenance event.
- A law enforcement agency uses the data warehouse to identify status of a nearby local work zone. When active the work zone restricts the number of lanes open to traffic leading to motorist diverting to local streets. Using the information, provided by the warehouse they can see when the work zone is active, and an increase of local traffic is most likely to occur.

### 3.3 External Agency Access Scenarios

Although the primary function of the project is to support critical partner agencies, other firms and contractors may benefit from restricted or select access rights. The information provided to them may serve to create new services for the public or to better operate and manage private resources.

#### *Scenario: Third Party Services*

Data available through the project may support efforts by local firms or agencies to improve their own operations or to provide new services to the public. Examples of this scenario may include:

- A major trucking company is looking for ways to improve routing its commercial vehicle fleet through the greater region, during peak AM periods. They request and receive traffic data for the past 12 months that allows them to plot more effective routes between distribution centers and local clients for its morning deliveries.
- A small startup company is working to develop an app that can predict travel impacts 24 hours in advance. They request and receive data on incident and travel times for the past two years; through the warehouse, using the information to identify key variables that when matched with current events, may lead to a greater chance for incidents to occur at certain locations for the following day.

#### *Scenario: Media Access*

Access to the normalized data provide by the project would encourage expanded coverage for events and broader information distribution by media. An example of how this may be supported includes:

- A local TV station is looking to expand the information they provide morning viewers on their upcoming commute. Using the warehouse, they start to show an overlay of work zone, crashes, and current stalled vehicles to give viewers a more comprehensive view of what they may encounter during their morning travels.

#### *Scenario: Remote Center Sharing*

Sharing data with transportation agencies is expected as part of the project. Better information exchange, coordination, and response are supported by the project. However, non-transportation related center coordination is also possible and may benefit the project in future stages. Examples of this scenario include:

- A county transportation agency is looking for ways to better identify local impacts to their operations, by seeing events generated by the transportation management center. Through the data warehouse the county agency gets alerted to crash data and using this information to better assign staff and resources.
- To better move crew around the region; a regional power company requests access to the data warehouse; they use information on local events and crashes to alert crews which routes to avoid as they move between job sites. Later through a data sharing agreement, the power company agrees to provide outage information back to the warehouse to help partners know where impacts are being experienced in their jurisdictions.

## 4 System Architecture

The RIDSI, data warehouse architecture will be determined through design efforts with a selected vendor. The architecture will work to utilize in place communications systems between the critical



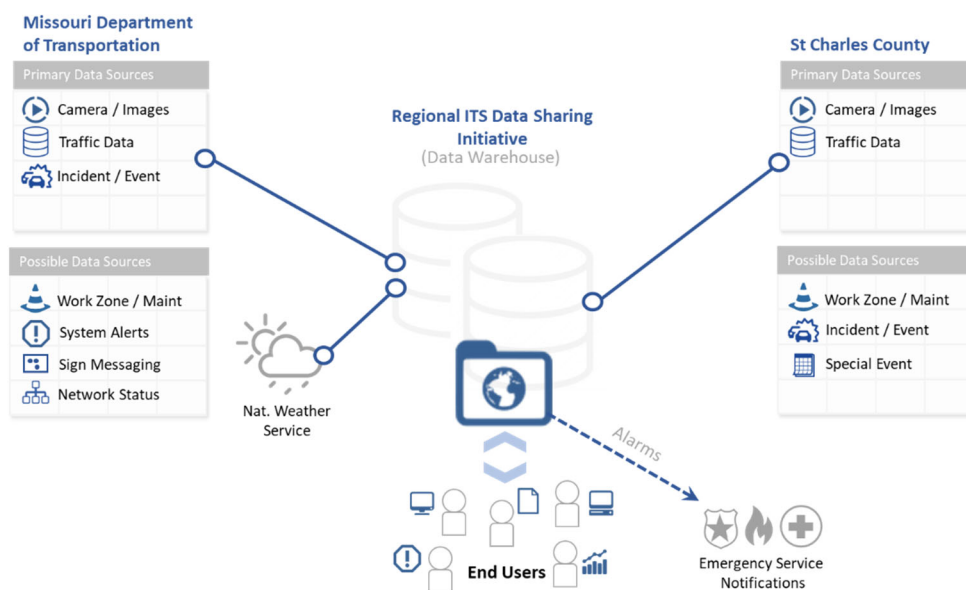
partners for data source collection back to a single data storage archive location. The partners will continue to store data locally, but for purposes of distribution the warehouse will be the primary location for future data distribution.

For distribution, the RIDSi will have a web interface, accessible through the internet. It is desired that the interface to the stored data be hosted on a web server that supports secure socket layer protocols. Users will have various privileges that allow for review, retrieval, and basic report generation on the data within the warehouse.

#### 4.1 Initial Deployment

The initial deployment of the system is anticipated to incorporate data from both the Missouri Department of Transportation and St Charles County. Data will be securely transferred to the data warehouse, and primarily include camera images, traffic data, and incident/event for the initial phase. Other possible sources of information that may be part of the phase 1 or future phase development efforts includes work zone/maintenance, field network status, freeway sign messaging, weather, and regional special events.

Figure 4-1: Phase 1 System Architecture



The end users of the system will access the data warehouse using an internet browser. Initial access will be granted through authentication. The landing page that users will see upon successfully entering their credentials will contain a status dashboard that displays when data was last refreshed as well as relevant visualizations that assist a user to better understand the current operational status of the data warehouse. The visual elements of the data dashboard will be designed with input from the partner agencies to determine relevant information to display.

The land page will also allow for selection, review, extraction, and general report generation of data and information requested by the end user. Furthermore, there will be event and alarms notifications that allow for incidents to be pushed to subscribed agencies/users.

## 4.2 Future Deployment

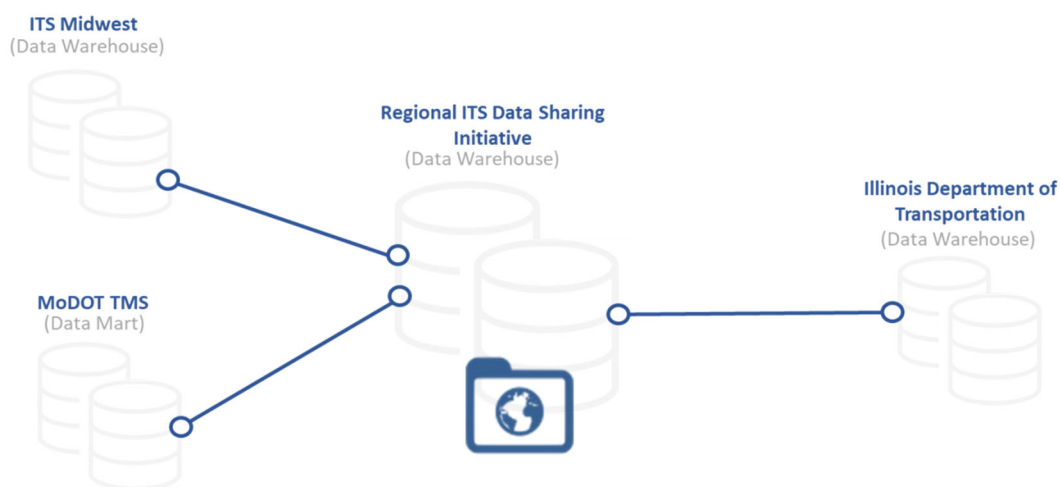
As the system evolves, lessons learned through the Phase 1 deployment will be used to generate and guide future deployment efforts. A review of the success of the deployment will help determine how to refine future goals and objectives, as well as how to incorporate new partner data as the system expands.

## 5 Other Ongoing Efforts

As the RIDSI is under development, other efforts are also in the process, or planned as part of other data collection and storage efforts. Currently there are efforts underway for ITS Midwest, which operates the collection and storage of transportation related operational data from five states, including Missouri. The MoDOT TMS is a local statewide effort that is currently in the design phases of adding additional information to continue building on their data collection/distribution platform. Illinois Department of Transportation already has an established data warehouse with participation from various states and transportation agencies. Their effort has been ongoing for more over a decade.

With each of these efforts it is envisioned that the RIDSI will share and distribute information with these systems in the future. In these cases, data transfers will be done through FTP, XML, or other web services that automates the transfer of relevant information without requiring special interaction with staff beyond the initial configuration.

Figure 5-1: Other Ongoing Efforts



## 6 Conclusion

The Regional ITS Data Sharing Initiative, is the next step in ongoing effort to take data generated at an agency level and to combine it with information from other sources to support greater understanding and improving responses to the region's economic, environmental, mobility, and safety needs.

The Missouri Department of Transportation and Saint Charles County, with support from East West Gateway, through the deployment of the RIDSI will begin the process of collecting and centralizing information sources for better historical and active event distribution, through the Phase 1 deployment.

From this initial effort, the RIDSI will continue to evolve and providing the region a primary source for historical and current data and a tool that supports planning, decision making, operations management, and incident response by agencies in the region in the years to come.

## EXHIBIT B : System Requirements

### Missouri Department of Transportation Regional Data Warehouse

**TABLE 1: Design Requirements Matrix**

Requirement Type: (S) System Function, (I) Interface, (D) Data

Req. ID	Req. Type	Requirement	Basis/Additional Notes
DATA COLLECTION			
100.1	S	Missouri Department of Transportation	
		System shall collect traffic speed, volume, and occupancy data when available for roadway segments	Data will be available in a feed out of the Central ATMS
		System shall collect travel time data for select corridors or designated destinations	
100.3	S	System shall collect operator generated incident data and active event data	
100.4	S	System shall collect operator generated or third party weather data or related condition information	Data available from central or from National Weather Service Feed
100.5	S	System shall collect roadside camera images (“snapshots”)	Data will be available in a feed out of the Central ATMS
100.6	S	System shall collect current messages displayed on dynamic message boards	
100.7	S	System shall collect operator generated road work, maintenance, and construction activities	
100.8	S	System shall collect operator generated special event data	
100.9	S	System shall collect generated information on current communications network status	
101.1	S	Saint Charles County	
		System shall collect traffic speed, volume, and occupancy data when available for roadway segments	Data will be available in a web service or central system API
		System shall collect travel time data for select corridors or designated destinations	
101.3	S	System shall collect operator generated incident data and active event data	
	S	System shall collect roadside camera images (“snapshots”)	
101.4	S	System shall collect operator generated road work, maintenance, and construction activities	
101.5	S	System shall collect operator generated special event data	
Additional Requirements			
102.1	S	System shall enable the collection schedule to be specified independently for each source	Each feed collected will have its own collection schedule and interval
102.2	S	Shall have collection intervals that allow for near real time data sharing	Scheduled collections can be configured from every 30 seconds to as long as every 15mins
102.3	S	System shall retry a failed collection attempt on a configurable interval	If a feed is unsuccessful, a retry will be made, and continue on the defined interval until the collection is successful, or the next scheduled collection occurs
102.4	S	System shall generate an alarm and notification when a feed was not available or was unsuccessful before the next scheduled collection occurs	System shall send out an email notification alerting that an error occurred when system attempted to collect data
102.5	S, I	System shall keep a log of successful and failed collection attempts, log shall be in a format that allow users to quickly see when errors or unsuccessful collections occurred	Log shall be accessible by users in an easy to understand format

DATA STORAGE			
200	NA	Data collection and data storage are treated as separate activities. Data collected may have to go through normalization, compression, or be scrubbed of sensitive information before it is to be stored. Time and intervals referenced here are meant to convey when that data operation would be finished and information made accessible.	Informational Statement
200.1	D	The system shall store collected video snapshots at five (5) minute intervals	Stored images should be in a format that is easily viewable without the need for a special or proprietary application
200.2	D	The system shall store collected operations data, emergency response assist data, including location, event type, responder, lane impacts, total time, and event characteristics at one (1) minute intervals	One minute interval is seen as desired but will be influenced by number of events being processed
200.3	D	The system shall store collected operations data, detector data from roadside units, including volume, speed, occupancy at one (1) minute intervals	
200.4	D	The system shall store collected operations data, incident event information including location, type, lane impact, severity, clearance time, number and type of vehicles involved, current responders on scene at one (1) minute intervals	
200.5	D	The system shall have the potential to store future computer aided dispatch from emergency center and law enforcement	Future Data no source has been identified at this time
200.6	D	The system shall have the potential to store future transit schedules and emergency routing for transit operations	
200.8	D	The system shall have the potential to store future special event information sourced from local private venues and government sources	
200.9	D	The system shall store operations data, except still camera snapshots, for a minimum of seven (7) years	
200.10	D	The system shall store still camera images snapshots for a minimum of ninety (90) days.	
200.11	D	The system shall store data using data definitions consistent with the Traffic Management Data Dictionary (TMDD) latest version	TMDD 3.3d (Dec 2016) is the current published version
200.12	D	Data collected will also include references to date, time, and source agency/system of when that data was received	
200.13	D	Log files on system "collection attempts" shall be kept for at a minimum of seven (7) years	
200.14	S	The system shall perform a full backup copy of the stored once per week, and performed during a time of low user activity	
DATA DISTRIBUTION			
300.1	I	<b>System Access</b>	
		The system shall provide a user interface for requesting stored data, through a web browser or web service	
		The system interface shall use the Hypertext Transport Protocol - Secure (HTTPS)	
		To access the system, a user will be required to enter a username and password	
		A form to request to become a user will available if the member has not accessed the site previously	
300.5	I	A new user will be prompted to enter a first and last name, organization (from a predefined list), email, and phone to register	Enough information should be collected to ensure a proper identity of the individual or firm requesting an account

300.6	I	A user email will be requested and used to verify account information	
300.7	I	A new user will be required to read and acknowledge the "terms and conditions" prior to sending request to be approved	Terms and Conditions may be different depending on data source such as County versus DOT
300.8	I	A new user can indicate the type of access and specific data they are requesting	Type of access may be a low level data view only or something more advanced such as a data source manager who may have rights to edit records; different data levels will be determined by agencies involved
300.9	I	New user requests will be sent to an Administrator, who will approval a new user request, before access is granted	
300.10	I	Current users can change their name, organization, email, phone, and password; but must login with valid account information before changes will be enacted	Changes should be flagged for Administrator review to ensure they are not suspicious
300.11	I	User accounts will be suspended if not used for a period of time determined by an administrator	
<b>Privilege Structure</b>			
301.1	I	The system shall provide an administrator interface for assigning user access and data privileges	Envisioned to be separate interface that can be accessed through the service and has an easy to navigate interface
301.2	I	Access privileges include but is not limited to how a user can interact with the data; amount of data they can request, the format of that request, and or if they have rights to review historical and/or current information	
301.3	I	Data privileges would include types of data that can retrieved including but not limited to cameras, incidents, detector, emergency response, geographical limits, and/or if the data sources (e.g. MDOT, County, etc.) that can be retrieved	
<b>Data Retrieval</b>			
302.1	I	The system interface shall require a user be authenticated before allowing a data retrieval request	
302.2	I	The system interface shall enable specific types of data to be requested.	Includes data types collected and stored by the system
302.3	I	The system interface shall enable data to be requested for a particular geographic region	Regions to be defined by the data source agencies
302.4	I	The system interface shall enable operations data to be requested for a particular time range	Time range will be configurable, likely to be in whole minutes and not partial or fractions of a minute
302.5	I	The system interface shall enable operations data to be requested for particular combinations of time, geographic region and operations data type	System will allow multiple attributes to be applied for the specific data being requested
302.6	I	The system interface shall provide operations data in response to a request, subject to restrictions on access to the requested data for the requesting system user	
<b>Dashboard View</b>			
303.1	I	The system shall provide an interface for monitoring roadway system and overall system performance; referenced herein as a "dashboard"	This could be the landing page for user when they first log in, or be a "view only" option for those just interested in seeing the latest information about regional traffic conditions
303.2	I	The dashboard shall provide roadway system performance parameters in a graphical user interface	This could include incident information, location travel time impacts, visual representations of traffic construction or other impactful events
303.3	I	The dashboard shall provide system performance parameters in a graphical user interface	
303.4	I	The dashboard shall use the Hypertext Transport Protocol - Secure (HTTPS).	

303.5	I	The dashboard shall enable displayed roadway system performance parameters to be configured.	
303.6	I	The system shall be able to associate user access restrictions with data collected through particular data interfaces.	Due to contractual obligations, third party users may be restricted from accessing subscription services procured by a source agency such as the case with a service like Here.com, Inrix, and TomTom, and public transportation agencies.
303.7	I	The dashboard shall enable displayed performance parameters that detail how the system is being utilized by users and how records are being collected, stored, and distributed	
303.8	S, D	The system interface shall provide operations data in compliance with the TMDD	The TMDD specifies the particulars of Center-to-Center (C2C) message exchanges.
303.9	S, D	The system interface shall provide operations data using the TMDD XML message formats.	The TMDD specifies the particulars of and options for C2C message content.
PERFORMANCE PARAMETERS			
400.1	S	The system shall maintain a record of the total number of records in the system for each operations data type	Performance parameters will be part of the system dashboard to help show how the system is being to observe its operational status
400.2	S	The system shall maintain a record of the total volume (bytes) of data stored in the system	
400.3	S	The system shall maintain records of data collection attempts from each data source, if an initial attempt failed; will also indicate last successful collection	
400.4	S	The system shall maintain records of data collection successes from each data source, and report the percentage of successful attempts over a 24-hour, 7-day, and 30-day periods	
400.5	S	The system shall maintain records of system user requests for data from each unique system user	
400.6	S	The system shall maintain records of responses to system user requests for operations data from each unique system user; report number of successful requests carried out, in the last 24-hour, 7-day, and 30-day periods	
SYSTEM REPORTING			
500.1	S	The system shall publish monthly reports of system parameters	Reporting generated should be sent to administrators as a file, or as a separate online visual dashboard that can be printed for records
500.2	S	The system monthly reports shall include counts of records added for each operations data type and trend over past six (6) months	
500.3	S	The system monthly reports shall include counts of the total number of records in the system for each operations data type	
500.4	S	The system monthly reports shall include the total volume (bytes) of data stored in the system	
500.5	S	The system monthly reports shall include counts of data collection attempts from each data source, along with trend over past six (6) months	
500.6	S	The system monthly reports shall include counts of data collection successes from each data source, along with the percentage of successful attempts showed as a percentage	
500.7	S	The system monthly reports shall include counts of system user requests for operations data from each unique system user, along with trend for the over the past six (6) months	
500.8	S	The system monthly reports shall include counts of responses to system user requests for operations data from each unique system user	

SYSTEM PERFORMANCE			
600.1	S	The system shall be able to complete each of its data collections prior to the next scheduled collection from the same source	
600.2	S	The system shall be able to service at least simultaneous data requests, without noticeable delay	The number of users may fluctuate but is expected to be initially around two dozen in number; will likely expand in time
600.3	S	The system shall be out of service for no more than one hour per month for scheduled maintenance or unscheduled downtime	