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To: SCB Contact: David Ridley
Agency:California Air Resources Board
Email: david.ridley@arb.ca.gov

Subject: 2023CARB_SMMI-RFI_2023-09-21

We are pleased to submit our response to the CARB SMMI RFI. I3 Systems develops and supports information networks and has been working closely with the City of Los Angeles's Information Technology Agency to create a framework for forward-looking information systems. Based on our experience, we believe the SMMI RFI covers three different and independent information processing issues. First, there is the mobile air quality monitoring vehicles themselves which serve as data generators. Second, there are potentially many air quality monitoring applications, AI modules, information display tools, and data analytics modules that might benefit from access to the expanded air quality data. And, thirdly, there is an information management system which serves to manage the links between the applications with the sources of data.

Based on our efforts with the City of Los Angeles, we believe it is important that each of these three components be considered as independent but related components of the program. Our position is driven by the following:

1. While it is understood that the SMMI RFI is intended to gather information needed to support CARB's purchase of mobile air quality monitoring vehicles, it is possible that the data from these vehicles will eventually be supplemented by data from additional mobile units sourced from other suppliers. Additionally, it is possible general purpose state vehicles will be retrofitted with air quality measurement devices to provide incremental sources of air quality data in the future. The potential for an expanded vision of mobile air quality monitoring should not cause a retrofit of the baseline system described in the RFI; the RFI air quality monitoring system should be future proofed and deployed with the intention to eventually support an expanded service capability.
2. It should be possible to easily integrate the data coming from mobile air quality vehicles with data coming from fixed terrestrial air quality systems. Rather than having two different air quality monitoring networks, one for fixed monitoring stations and one for mobile air quality monitoring sensors, the goal should be to create an integrated network that provides a more complete view of air quality monitoring.

3. We note that a number of private entities (businesses, residences, and NGOs) have deployed their own air quality monitoring stations to support their individual needs. We believe the California air quality monitoring network should be able to accept data from these private sources and integrate it into the CARB network. Privately sourced data reduces the need for California to deploy redundant stations, and provide more complete geographic coverage, and by involving private entities in the project the state both educates and increases awareness of the importance of air quality.
4. While the State of California may identify a preferred source of air quality monitoring software, there is a strong possibility that new software technology will emerge and the State should be able to move to an alternate software supplier as that technology becomes available. This requires that the air quality monitoring software be considered independent from the mobile air quality monitoring vehicle decision.
5. A key user of air quality data is the academic community which is engaged in air quality research. Cutting-edge air quality researchers prefer direct access to air quality data which they can integrate into their own research applications rather than working through a third-party application.
6. We expect that over the life of the CARB SMMI project, there will be increased use of CARB data by local government and businesses to increase the use of air quality conditions as a factor in planning local operational activities. For example, schools will increasingly use real-time air quality data and with AI systems to adjust daily activities and schedules. While AI systems that aid school districts' schedules are still under development, once they come to market these systems will want direct access to air quality data independent of intermediator applications.

For the above reasons, we believe that as the RFI evolves toward an RFP, the structure should evolve to contain three components that can be bid on independently by suppliers that are strategically focused on one or more of these components.

To the best of my knowledge, all the information contained in this document is true and accurate as of the date of its submittal.

With Respect

Gerard Power
CEO, i3 Systems

Attachment – A Vendor Profile

1.	Identify the Company Name, address, city, state, and zip code, telephone.
	i3 Systems 1146 N Central Ave #687 Glendale, CA 91202 (213) 760-1627
2.	Identify the name, title, address, phone number, and email address of the primary contact person for this RFI.
	Gerard Power CEO i3 Systems 441 Nolan Ave Glendale CA, 91202 (213) 760-1627 Jerry.power@i3-iot.com
3.	Provide a brief overview of your company including number of years in business, number of employees, nature of business, and description of clients.
	i3 Systems was formed as a startup in 2020 to develop information networking systems based on research originally conducted at the University of Southern California. It was incorporated in the State of Delaware and currently has ten employees focused on delivering information networking solutions primarily to government entities. Its most significant customer to date is the City of Los Angeles. At its formation, the company understood that data networking companies are intended to provide end-to-end network connectivity and expects that applications and devices will assume the responsibility for interfacing to the network. The result of such an architecture replicates effort between applications and devices making it difficult to deploy, manage, and maintain an information network that spans different suppliers and sources of information. By incorporating information networking concepts into the system infrastructure, i3 Systems is able to reduce overall costs, increase efficiencies, and make it easier to expand the capabilities of an information network. When information is treated as an asset and actively managed for the benefit of the organization, for today and tomorrow, rather than just as today's application consumable, collaboration is increased, the life of the system is increased, and the result is made more versatile.
4.	Identify any parent corporation and/or subsidiaries, if applicable.
	Not applicable.
5.	Give a brief description of your company's product(s), platform(s), service(s), etc. that may be relevant to this RFI.
	i3 System has developed an information networking platform that, at its core, serves as an information distribution fabric; information owners are given the tools they need to manage the distribution of the information they generate and own. This distribution fabric is surrounded with a series of information adaption applets that allows the system to be adapted to support different information protocols from various application and device manufacturers allowing the system to support multivendor environments. The unique permissioning based information distribution system was specifically designed to support

	federated organizational structures which will allow the CARM SMMI to support a range of information customers including state entities, local governments, academic institutions, private citizens, and other with consolidated information generated by a range of sensors supported by these same institutions. By avoiding the creation of a siloed data structure, the SMMI can become a rich collaborative information exchange that is much more complete than a state sponsored air quality point solution. The i3 System would allow CARB the freedom to decide which air quality data is released publically and what data would be treated as confidential internal operational data. The software would also allow CARB to distribute data according to a CARB preferred API structure or to support multiple APIs. The latter being a likely operational requirement as standards continue to evolve and create the potential requirement that CARB may need to support multiple data formats simultaneously. i3 Systems has also created a mobile edge processing system that allow information networking features to deployed at the edge of the network and it includes support for mobile information collection vehicles.
6. List and briefly describe the projects and/or activities your company was engaged within the last ten (10) years that are similar to the project identified in the RFI.	
	As a fresh startup with three years of history, i3 Systems does not have a long list of projects under its belt but the projects i3 has been used as the foundational data platform, have been significant to operational improvements. I3 is anxious to grow and support the State of California's efforts to support its citizens. I3 Systems most significant projects to date include a project undertaken with the LA Information Technology Agency (ITA) to improve parking in the Los Angeles area and a project undertaken with the LA Department of Sanitation (SAN) to bring mobile sensor and AI technologies to the Departments Sanitation trucks. The i3 Systems technologies have been used by LA's ITA team to create a parking application that shows citizens parking availability, block by block, across the City of LA. To do this, the system ingests information from a variety of parking lot management systems, both public and private, to create a consolidated view that transcends organizational divides. The system is worthy of note because the application was developed by ITA directly and shows the i3 System's ability to support independent application development teams. It also serves to highlight the vendor and organizational agnostic capabilities of the system as a key requirement called for the integration of public and private information coming from a wide variety of sources with different functional capabilities. By helping residents identify parking options, cars that might otherwise be circling is search of parking are gotten off the road sooner thereby improving air quality and reducing congestion. The second project of significant note is the effort i3 Systems has undertaken with SAN. SAN is interested in using AI and video cameras as sensors to collect operationally significant information about SAN and other city services in order to improve overall city operational excellence. I3 Systems developed a mobile edge processing system that can be deployed on SAN vehicles to collect and alert city departments when key operational issues are detected by vehicle based AI systems. This project is of note because it required i3 Systems to develop a mobile edge processing system that collect information from mobile cameras and use AI technology to convert large scale digital streams into

	meaningful information flows. This project was undertaken in collaboration with the University of Southern California's video/AI experts and highlights the i3 ability to support information processing systems provided by independent third parties.
7. Are there any of the requirements described in the Proposed Environment section not technologically feasible with your existing service(s), product(s), platform(s)?	
	i3 Systems is an information management systems and not a sensor company and not a data storage warehouse. Technically, the i3 system can accept data of any type and format received over a variety of data network types. Similarly, it can publish information of any time and in any format to an application connected via a range of data network types. As long as the suppliers of application software and air quality sensors have a published API definition, we are confident in i3's ability to support the necessary interfaces. Beyond the use case described in the RFI, use of i3 would also allow the state to contract with multiple companies providing different mobile air quality sensing vehicles – with different vehicles potentially being equipped with different sensors for situational specific deployments. i3 would also allow the State of California to retrofit existing state vehicles with air quality sensing kits effectively turning the state's existing assets into mobile air quality sensing stations. Finally, the i3 system would also allow the state to integrate non-mobile air quality sensing stations, both public and private, into a state-wide view of air quality information. Use of i3 would also allow the State to support one or more cloud-based data storage warehouses. i3 users would have the ability to feed information coming through the i3 system into large, cloud based data lakes that can be managed independently from the active information flows and/or they feed the information coming through the i3 system directly into a set of applications where each application has a special purpose. Over time, this gives the ability for the State to develop or purchase new air quality monitoring software, switch cloud vendors, and support hybrid clouds independent of the information network. This capability would also allow the State to easily feed information to academic and research labs for short or long term external analysis as appropriate.

Attachment - B Vendor Questions

I. General Questions

1. What scale of operation would be required to bid on a future RFP of the concept described here? Are there any minimum requirements necessary at which below you would not be interested in bidding on a proposal of this nature?	
	There are no restrictions. The i3 System was designed to be technically and financially scalable. As a side note, the design of the i3 architecture will allow the system to support distributed multi-party operations once implementation of this feature is complete. Distributed multi-party operations would allow local governments to run their own i3 nodes subordinate to the State's i3 system, thereby allowing these subordinate processing systems to directly feed information into the States air quality monitoring system and to allow the State to directly feed information into a federal air quality monitoring system. Such distributed operations would even allow the State of California to exchange air quality information with neighboring states.
2. What types of monitoring objectives have you explored using your company's mobile monitoring approaches?	
	i3 Systems has created a modest demonstration of an air quality monitoring system that shows i3's ability to take in air quality information from multiple sources and use that information to dynamically generate alerts that could be sent to private citizens, companies, government agencies, elected officials, and emergency personnel. This demonstration system was originally built to show i3's ability to support the community's need for information should the State of Hawaii be faced with another wildfire emergency.
3. What are the advantages and limitations of your company's mobile monitoring services?	
	The largest advantage of an i3 information network is its ability to accept information from a large variety of sources in a variety of formats (streamed and message based information flows). This makes i3 agnostic to the vendor and organization generating the information. I3 is also agnostic as to the destination and format of the delivered information allowing the system to support the needs of a complex network of customers each seeking to serve their individual mandates. We expect to deliver our information networking software to the State of California and the State would run the software on their private or commercial cloud system (the software is delivered as a Docker image). Some might characterize this as a limitation because i3 Systems would does not operate a data center on behalf of the State of California, however, others might characterize this as an advantage because the State would have complete oversight of the information's chain of custody making easier to monitor and oversee data security.

II. Engagement and Coordination

1. Describe your interpretation of what community engagement should look like throughout the process of conducting mobile air monitoring in communities.	
	There are two different aspects of community engagement that need to be considered. (1) Community members should have the ability to contribute privately generated (commercial and residential sources) air quality information to the state's air quality monitoring system. Since the calibration of privately owned equipment,

	the state may want to consider this information as secondary information but is important that the community has an active role in the monitoring process. (2) Community members should also have the ability to review the live information collected by the state in real-time. We point out that many states that collect air quality information offer periodic releases of compiled data files but do not release data in real-time. Release of real-time data through i3 is seen as a mechanism to increase community involvement in air quality issues. Further, some states only release the information as a graphic dash board but do not disclose the data used to generate the dash board graphics. Such visualization tools can be viewed with suspicion but i3's ability to support both types of information release serves to increase community confidence in the baseline data. I3 considers dashboard and historic files are good to have but believes such tools should be considered as supplemental to the live information feeds when seeking to increase community engagement. We would also suggest that the state may want to consider the possibility of moving away from releasing air quality information as untracked open data. We believe that state may want to consider requiring information consumers be required to register so the state can track who and how this information is being used. The list of registered users can serve as a basis for the state to create and disseminate periodic newsletters or to send out informational notices to impacted users. We also acknowledge that some citizens may feel comfortable releasing privately generated air quality information to the state but they might not feel comfortable giving the state permission to release their information to third parties. I3 supports these ability to support these features
2. What experience do you have with community and public engagement? Is any of this experience directly related to air monitoring activity and information dissemination?	
	I3 Systems has not supported the deployment of an air monitoring activities but our largest customer is the City of Los Angeles which supports the Los Angeles community and has given i3 Systems experience developing information management systems that impact community engagement. The parking project we are working on with the city requires that information flow between commercial parking enterprises within the city and the city itself. This effort effectively forms an information consortium between government and the private sector which is relevant to the states air quality monitoring system. Additionally, our project with the department of sanitation is based on video sensors which puts i3 Systems to the forefront of many conversations related to information privacy which is also relevant to an air quality monitoring system. We have also proposed an air quality management system for the state of Hawaii intended to alert residents of smoke hazards and are working with an international consortium on a plan to create a global air quality management system.
3. What is your experience coordinating with community members, CBOs, regulated industry, academia, and governmental agencies when planning monitoring objectives and data analysis and communication?	
	I3 Systems has significant experience dealing directly with regulated industries, academic institutions, and government agencies. We have some limited experiences dealing with CBOs but have normally worked through other government agencies to interact with community members directly.

4. Please provide the number and size ($) of technical projects previously managed for coordination and communication with both community and technical contractors.	
	We estimate the value of the Los Angeles Sanitation project which is in its early deployment phases represents a $7M opportunity over the life of the project. The parking project which is currently in the approval process, represents a $2M opportunity over the life of that project.
5. How would you apply your engagement and coordination model on a statewide scale?	
	Because i3 Systems is a startup, we would need to bring on additional staff to deal with a statewide project. We support two engagement models and the amount of incremental staff would be dependent on the engagement mode the State would prefer. Under one engagement model which we have successfully used with the City of Los Angeles, the state would take on the role of the project management and i3 Systems would support the states development team (including any associated contractors and suppliers). Under the other i3 System engagement model, which we have also used successfully with the City of Los Angeles, i3 Systems would assume the role for project management and integration services. We believe the former engagement model works best if the requirements are well defined and relatively stable while the second engagement model works best if the requirements are somewhat fluid and require research or experimentation in parallel with the deployment program. A third option, which i3 Systems is open to, would be structure where an independent entity serves and the project manager and integrator with i3 Systems supporting that prime. In all cases, for a project of this type, we would encourage at least one academic institution as a project partner.

III. Mobile Monitoring Technologies and Capabilities

1. How many mobile monitoring platforms do you currently own and operate? How long have these platforms been in operation?	
	I3 Systems is a software company and does not own or operate any mobile platforms
1a. What areas/sources/locations do you have experience conducting mobile monitoring?	
	I3 Systems is a software company and does not own or operate any mobile air quality monitoring platforms, however, i3 Systems has developed a mobile video/sensor monitoring edge processing system that can be retrofitted into existing city vehicles for the City of Los Angeles.
1b. Has collected data been used to support community emission reduction, enforcement, or other actions? Please provide examples.	
	The LA Parking project is intended to get vehicles to parking places quicker and in doing so reduces street congestion. This will undoubtedly improve air quality but to date, air quality monitoring has not been a part of the project. However, we see this as a reasonable and straightforward extension to this existing project.
2. Please provide operational information on your company's current mobile monitoring capabilities.	
	I3 Systems does support a mobile information collection platform which is integral to the LA Sanitation project, while the information collected by this platform is video based data, the addition of air quality information collection to the platform would be a straight forward feature enhancement supported by the original product design.
2a. What frequency can platforms be deployed?	
	Once the SAN project has matured, we have planned to have the ability to deliver 15 installation kits to the City of Los Angeles every month.

2b.	What days/hours are the platforms generally in use?
	The SAN project would be using their platforms 8 hours per day for 5 days per week.
2c.	What pollutants can be monitored and with what frequency?
	Presently none, however, the i3 System was developed to monitor, collect, and distribute data from a large number of data sensors. The specific requirements for interfacing to air pollution sensors this would be determined by CARB through their selection of a mobile air quality monitoring vehicle.
2d.	What types of instrumentation do you use? Describe all relevant methodologies.
	Presently none, this would be determined by CARB
2e.	What level of coverage or scale of monitoring can be accomplished within a community? (For example, how would you approach characterizing emissions from a source or identifying a leak? How long would that take?)
	While i3 Systems is open to other approaches, we envisioning a system where the State of California's existing air quality monitoring stations (both fixed and mobile) coupled with information contributed by private citizens and enterprises provide baseline information over the entirety of the State of California. This air quality information network would include air quality monitoring stations deployed in California by local and national government entities and could be supplemented with temporarily contracted private air quality monitoring services on an as needed basis. During times of stress, mobile monitoring stations would be marshalled to a targeted region to provide hyper-local air quality monitoring support. And, during time where there are no identifiable stress points, these same mobile monitoring stations could be moved through the state to validate the findings and quality of the fixed air quality monitoring stations.
2f.	How do you determine that you've adequately characterized a given area?
	Air quality in a given area changes depending on local conditions, weather, and scheduled human activities. Instantaneous readings in a given area can be validated it there are multiple constant readings over time periods with similar conditions. However, to determine air quality conditions over the entirety of a day (e.g. to capture the effects of commuter traffic), consistent readings may be needed over the course of several weeks. As another example, If the interest is to investigate the impact of Santa Ana winds, measurements over a matter of months may be needed. Thus the term adequate is highly dependent on the issue under investigation and the factors that impact air quality for that specific issue are under study. This is one of the reasons why i3 Systems believes that it is important that the Mobile Monitoring Initiative produce information that can be integrated with other sources of air quality information.
2g.	What workflow processes or software do you have for managing mobile monitoring?
	i3 System's mobile edge processing information system stores all raw data collected locally so that it can be later uploaded to the cloud when the mobile platform returns to its home base (allowing the information to be uploaded via low cost WiFi). While the platform is not connected via WiFi, it can connect to the host server via the 5G network and transmit alerts or information of immediate concern as it is detected. AI processes are used to identify significant events from the plethora of incoming information. These AI alert blades can be built by i3 Systems, academic or research institutes, or the State of California. While trucks can have the same alert engines configured, it is also possible to

	configure different alert engines for use in different geographies or during times of immediate crisis. I3's ability to support both 5G and WiFi, allows the information management system to receive data from parked and mobile monitoring vehicles. It also allows the state to balance their network in order to minimize celluar service costs by using alternative connectivity technologies when they are available. The i3 software would run on a CARB server. As such, CARB remains in complete control of the data and has visibility to all data entering and exiting the system. As a software platform provider, i3 Systems has no direct access to the data flowing through CARB.
3.	Describe your usual approach or strategy to mobile monitoring.
	Mobile sensor monitoring would be determined by CARB and its partners. As a suggestion, CARB could station their mobile vehicles at regional universities and use students/university staff to drive vehicles in their region. This ensures the local driver is familiar with the local area and serves to encourage universities to conduct research using the information they helped to collect. Monitoring of the mobile edge software is managed by the i3 information manager. As the mobile device moves about an area, connectivity may be switching between WiFi and 5G and these changes in connectivity are reports to the i3 information manager as an alert to maintain system connectivity awareness. Access to these information messages is totally configurable by the system administrator so operational data can be reported on a need to know basis. System reboots, and other important system events are also reported to the i3 data fabric.
3a.	Drive plan and operational logistics
	This would be determined by CARB and its partners
3b.	Staffing
	This would be determined by CARB and its partners
3c.	Power requirements (e.g. battery powered, requires generator, etc.)
	The i3 edge processing system is powered by 12V vehicle battery
3d.	Consumables
	None
3e.	Quality control procedures
	I3 software is actively tested during the development process. Beta versions of the software are available for customers who are willing to participate in testing new software releases prior to their general market availability. All i3 software us run through various test procedures that scan for security issues as well.
3f.	Performance and acceptance criteria (e.g. precision, bias, limit of detection)
	This would be determined by CARB and its partners
3g.	Data logging and storage
	As an information network, by design information is not stored in the data fabric but instead sent to applications in need of said data and to databases designed for long term archival. Data changes however are logged allowing the system manager to validate that any information transiting the system can be tracked and traced.

	The edge processing system is different because connectivity to the central processor cannot be assumed. Information in the edge process can be temporarily stored on the local edge processor for later transmission when the data volumes are so large to preclude transmission over the 5G network. This cached data can be held until connectivity is restored or until the mobile processor is connected via a low cost transmission network. In the latter case, Information of immediate interest is directly set to the host processor via 5G and can be used to trigger immediate actions (e.g. generation of a community alert or notices to emergency services, news stations, etc). Long term information is stored on the local edge processor and uploaded once the system is covered by a wifi network in an effort to minimize 5G operational costs.
3h.	Notifications and communication
	Notices and alerts emitted from the i3 edge processor are customizable/configurable.
4.	Please provide an estimated cost to operate all applicable mobile monitoring platforms as a function of time (e.g. 1 week of monitoring) deployed and/or measurements taken.
	Operating costs associated with the central data fabric are largely focused on cloud storage costs and on licensed capacity options. These numbers can be fractions of a penny per message transmitted. Costs associated with the edge processor are driven by the volume of data transmitted over the 5G network. Since the administration determines which data should be held in cache until the mobile processor is covered by a low cost wifi network, operational costs are driven by the configuration; the system operational costs could indeed by zero, however, the same system could be configured to treat all data as critical data which would immediately be transmitted over the 5G network resulting operational costs consistent with the total volume of data collected.
4a.	These cost estimates should include all costs associated with mobile monitoring operation. This includes but is not limited to:
4a.i.	Direct costs – instrumentation consumables and repairs, vehicle operation costs, staff cost to operate platforms, recharging requirements.
	As an information processing network, the costs associated with vehicle operation are outside the scope of these response. However, for the vehicle based edge processing system, If this option is selected, the software would be $2500 per vehicle plus the cost of a mobile computer to support the information network and any desired AI modules. The Of the AI support modules were to be developed by a university as part of their educational program, these modules might be limited to development costs. Ongoing support costs are approximately 18% annually of the initial price of the software.
4a.ii.	Indirect costs – support staff costs, associated insurance for operation, administrative overhead, any required permits.
	To operate the central data distribution fabric, the system could be configured and run on a commercial or private cloud as part of the State's IT network support system and would therefore avoid driving any costs to the CARB.
4a.iii.	Data Management – costs to move data from raw data collected by instrumentation to the final data products requested by CARB.
	The i3 software is an information management system that is highly configurable. If the system is configured to hold messages in cache until the mobile processor is covered by WiFi, 5G transmission costs can be completely avoided. If the system is to actively transmit data over 5G as it is received, there would be 5G costs that are largely determined

	by the nature of the 5G service contract the State holds with their network service provider. In the central core, there is a capacity license that is associated with data transformation/transmission through the system. These costs are dependent of the volume of messages. Costs per message are normally well below one penny per message.
4b.	How often are invoices and payments typically required?
	For the City of Los Angeles we use an annual billing period, however, i3 Systems is open to quarterly or monthly payment cycles for ongoing support services.
5.	If an RFP is developed based on the information provided here, how much preparation time is required to deploy the platforms and begin monitoring?
	The duration is highly dependent on any customization and integration services desired by the State of California. If the CARB is satisfied with the off-the-shelf capabilities of the software, the software can be delivered and deployed immediately. If CARB decides to modify the configuration themselves, these changes can be undertaken by competent IT resources and started immediately. As another alternative, the State could outsource the configuration of the system to i3 Systems.
5a.	Do you have recommendations for a minimum timeline to achieve potential monitoring objectives described here?
	I3 Systems believes the first mobile monitoring platform could be installed and made operational within three months. This timeline allows for ordering, deliver, and configuration of the core data fabric (one month), configuration and testing of any CARB air quality sensors (one month), and one additional month for testing and operational validateion.
5b.	What is the maximum number of platforms that you could deploy by early 2025?
	The i3 Software could be delivered to CARB and deployed in large volumes at will. However, we believe it would take CARB or some time to install and integrate the software onto the mobile platform. For planning purposes we should suggest a managed ramp up to a rate of 15 units per month allowing approximately 100 units to be deployed and operationalized by early 2025.
6.	Do you have experience developing Community Air Monitoring Plans (CAMPs) as defined by the CARB Community Air Protection Program Blueprint5 or similar? Please provide examples of community-focused monitoring plans or similar.
	At the time of this RFI, we do not have any immediate experience developing a Community Air Monitoring Plan but we have reviewed air monitoring plans and guidelines and believe that the i3 System is capable of supporting the information networking components of such plans. However, we do have other proposals outstanding relevant to the needs of CARB and expect that we will have active use cases by the time the RFP is issued.
7.	Do you have existing standard operating procedures (SOPs) or quality assurance project plans (QAPPs) for your mobile monitoring approach?
	I3 Systems does have software testing and procedures which have been developed to ensure i3 Systems delivers quality software products. We also have testing process we have developed for deployment validation and testing that we could share with CARB.

IV. Data Collection, Storage, Reporting

1. In what format do you generally provide data to your clients? What is your final data product?

	I3 Systems supports a device/application wrapper system that is able to accept and generate information in a wide variety of formats and protocols, including binary and text based message formation. I3 Systems generally uses binary data to support video sensor data and high volume system messages. ASCII based messaging (e.g. text, CSV, json,..) is typically used for low volume messaging. It is expected that CARB will decide on a common API in order to format the data consistently for external consumption. The i3 software tools can then be used to adapt data flows following a different data format to the CARB standard format. CARB is free to choose the data format that is most advantageous for its constituency base, and should sufficient demand arise for alternative formats, I3 is capable of supporting multiple data formats simultaneously.
2. Do you have off-the-shelf, or modifiable-off-the-shelf, data management products compatible with mobile monitoring data?	
	Yes. i3 Systems provides a highly customizable/configurable off the shelf information management system to support multivendor, multi-technology information processing environments.
3. What is your experience in mobile monitoring data analysis and visualization? Specifically, do you have any experience using ESRI products to manage and visualize data?	
	ESRI was a founding member of the i3 Consortium, a community based organization focused on increasing information collaboration, information effectiveness, and information efficiency. While i3 Systems have not taken on any projects where i3 Systems directly interfaces with ESRI, the City of Los Angeles is a long time ESRI customer so we do not expect there will be any issues.
4. What is your experience in public dissemination of complex information? To what extent have you generated data visualization for the public?	
	Typically, i3 Systems focused on the collection, management, and dissemination of information in complex network environments and has left the public dissemination of complex information to our customers which have direct experience with the needs of their constituencies.
5. What suggestions do you have for handling large amounts of data from a variety of sources (e.g. multiple mobile monitoring platforms) into cohesive data visualizations?	
	I3 Systems believes it is important to draw a line and segment the information visualization aspects of the program from the information aggregation, management, and dissemination aspects of the program. The reason for this separation of church and state is that it allows the visualization processes to be managed independently from the information management processes. If such an architectural division is not established efforts to evolve the visualization software often ends up being impeded by the information management program or the information management program ends up being impeded by the visualization program. A line of demarcation is necessary to allow these two aspects of the program to evolve independently over time and serves to extend the life cycle of the overall program.

V. Feedback

1. Provide input on the requirements or areas listed in this RFI. Specifically, CARB is looking for:

1a. Availability of existing systems that perform all or a portion of the requirements in Section II – C. New systems cannot be built using funds in a potential RFP.	
	There are existing air quality monitoring systems (non-mobile) that are already in place and being operated by academic institutions, NGOs, local government, and national government entities. The information from these existing systems should be integrated into the larger SMMI information network to reduce the costs associated with a new large scale SMMI network. Further, the system should be constructed so new systems deployed by non-state agencies can be easily integrated into the SMMI system as they begin to emerge.
1b. Questions, suggested modifications, or additions to the proposed environment that would allow or encourage potential bidders. Please include justifications for any suggested changes and concept modifications.	
	i3 Systems believes a key requirement for the SMMI system should be to enable the support for multi-vendor operations. The system should be able to support mobile platforms from different suppliers potentially owned and operated by different entities. Further, each mobile platform owned and operated by the State should be modular in design and allow vehicle specific sensor networks to be extended with new sensor technologies as they become available. This should include the ability for the State to replace existing sensors with new sensors from alternative suppliers if conditions so warrant. This type of requirement is important if the State to continue to benefit from their Air Quality Monitoring investment over the long term despite the fact that the technologies will continue to evolve and the business entities that support the original investment will continue to evolve as well.

Attachment - C
Rough Order of Magnitude Cost Estimate

Rough Order of Magnitude	
Estimated range of cost per month of full-time monitoring. This may be costs associated with conducting monitoring, engagement activities to support monitoring, or both. If this is not applicable, please specify a different time range or more appropriate metric to quantify your capabilities. Please describe what "full-time monitoring" looks like for you and itemize costs with as much specificity as possible.	$2500/month for the i3 platform software.
Estimated range of cost to complete a full year of monitoring.	$30,000
Answers and Assumptions Used in Cost Estimate	
Please answer, in as much detail as possible, the State's questions (1-4) below. Also, please provide details pertaining to the assumptions, expectations, and/or performance parameters used as the basis of the cost estimate.	
	It assumed CARB has the Docker-capable private cloud or public cloud service needed to support the i3 software. Storage costs are dependent on the amount of legacy data CARB wishes to maintain for historical analysis and reporting. It is assumed that CARB will consider 5G data transmission costs needed to support the mobile monitor vehicles will be considered a part of the vehicle operating budget.
THE STATE's QUESTIONS and VENDOR'S RESPONSE/ANSWERS:	
1. What is the timeline for your mobile platform(s) (that is, how many platforms do you have operational right now, and what is your timeline for launching more)? Will your platform(s) depend on additional funding to reach and sustain maximum planned capacity?	
	The i3 data management system is currently operational at the City of Los Angeles Information Technology Agency. An additional i3 node is being used by the Department of Sanitation to evaluate the use of AI to auto-detect city service issues on a proactive basis. Release 2.0 of the i3 software will be released in November of 2023 and is being considered for use in the support of a global air quality monitoring system.
2. Approximately how much monitoring can be accomplished in the period of a month? A year?	
	The i3 Systems has been spec'ed to support up to 100M data connections. This total includes the sum of all air quality vehicles, all fixed air quality stations, all enterprise supported air quality stations that are sharing their data with the state, and all data consumers including multiple state applications, web displays, digital twin and AI engines, and university research projects.
3. Are there any requirements that would preclude you from competing should an RFP be released? If yes, what suggested changes would allow you to compete?	

	If the RFP is structured to require a single supplier provide application, data management, and the vehicle, i3 Systems would not be able to respond. If the RFP fails to ask that the data from the mobile monitoring vehicles be integrated with the data from fixed monitoring stations or does not require flexible data delivery to multiple sources, the resulting deliverable would create an isolated data silo that inhibits operation. In this case, it is unclear whether i3 Systems would respond to such an isolated system.
4. Are any of the goods, products, or services you've identified in your RFI response available on a Federal GSA or State of CA LPA? If yes, please identify the contract type, name, and number.	
	no

VENDOR'S ASSUMPTIONS:

What assumptions have you made in preparing a response to this RFI?	
	I3 Systems assumes that when the CARB-SMMI RFI moves from an RFI to an RFP, the RFP will be structured in three parts in order to allow respondents to respond to the analytics/display software component, to the data management component, or to the vehicle component individually. An alternate RFP structure would be to release the software, data management, and vehicle components as independent RFP/RFQs.