

GREATER HOUSTON HEALTH INFORMATION EXCHANGE

Business and Operating
Plan Submitted to the Texas
Health Services Authority and
Texas Health and Human
Services Commission on
October 18, 2011

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EXECUTIVE SUMMARY

STATEMENT OF UNDERSTANDING

Greater Houston Health Information Exchange (GHHIE) understands that the State of Texas, by and through the THSA and HHSC, seeks to enable improvements in the quality and efficiency of the Texas healthcare sector by establishing an electronic health information exchange (HIE) infrastructure for the state. In March 2010, HHSC received an award from the Office of National Coordinator for Health Information Technology (ONC) for funding through the State Health Information Exchange Cooperative Agreement Program. Created by the American Recovery and Reinvestment Act, the program funds planning and implementation of electronic health information networks to support higher quality, safer and more efficient healthcare. The goal is to ensure that the right information is available to the right healthcare providers at the right times.

GHHIE was one of sixteen (16) local HIEs in Texas awarded planning grants in April, 2011. Continued state funding is contingent upon demonstration of results based on defined, measurable and beneficial outcomes that reflect the impact and value of HIEs. A matching funds requirement requires HIEs to demonstrate additional funding through in-kind support and philanthropy. GHHIE has completed the initial planning phase and is poised to move to implementation. GHHIE supports the goals and will meet the requirements of the Local HIE Program. This Business and Operational Plan addresses the requirements to receive the available funding to move forward to support the statewide vision.

ATTESTATION

Funds will be used solely for development of new HIE capacity. All program funds received from the HHSC grant, including local matching funds, will only be used for the development of new health information exchange capacity.

BUSINESS & OPERATIONAL PLAN COMPONENTS

Healthcare is a strong business sector in the Greater Houston market, home to the Texas Medical Center, and healthcare providers span the continuum from integrated delivery networks to solo practitioners. Naturally, all of the area's businesses are very interested in enhancing the health of their employees and the community at large, preferably while slowing the increase in healthcare costs and improving quality. GHHIE has the opportunity to convene healthcare providers to enhance the care in the community by putting patients and their information at the center of the implementation of health information exchange. This Business and Operational Plan ("BOP") is a product of the significant contributions made to the planning process by many providers with diverse interests. At the center of the plan is the common goal to improve care to the patient by collaborating on a more effective and efficient method to have the appropriate information available at the point of care. The BOP will describe GHHIE's approach to the components required to comply with the THSA requirements and make GHHIE a Network of Networks.

ORGANIZATIONAL OVERVIEW

INCEPTION, MISSION, VISION, PRINCIPLES

GHHIE developed as a collaborative effort of The Harris County Healthcare Alliance (“Alliance”) and the Center for Houston’s Future (“Center”). It meets a long-standing community priority as stated in the 2004 Greater Houston Partnership (“GHP”) Public Health Task Force’s recommendation for development of a community health information network to link the public health delivery system with private providers. Thus, GHHIE was established in August, 2010 as a Texas not-for-profit corporation. An application for 501(c)(3) IRS tax-exempt status will be submitted in October, 2011.

The Greater Houston market has explored forming community HIEs in the past, but was not successful. The current initiative has the advantages of community engagement outside healthcare as well as enhanced funding opportunities. In addition, the current national and state landscapes for HIEs have added incentives and penalties to the effort to foster electronic exchange of healthcare information for the benefit of patients, physicians/providers, hospitals, employers, payers, and the community.

In December, 2010, GHHIE’s Board of Directors approved the mission statement, vision and goals.

MISSION

A patient-centric continuum of care will exist in the Greater Houston area that enhances overall population health, reduces health and wellness costs, connects all healthcare and wellness services providers and clients, facilitates region-wide healthcare and wellness policies and programs, and advances opportunities for long-term research for disease prevention and cures and evidence-based clinical protocols for optimal care.

VISION

Develop and implement an electronic health information exchange for the Greater Houston region that will enable all patients and healthcare and wellness service providers to easily access patient records for true continuity of care.

- *Coordinate the development of GHHIE in collaboration with the Center for Houston’s Future, the Harris County Health Care Alliance and other stakeholders in the region.*
- *Act as a neutral broker to enhance collaboration between the community, hospital systems, physician providers, independent hospitals and other health and wellness organizations across the Greater Houston area with the goal of broad-based community support and participation by public and private healthcare providers.*
- *Improve the efficiency, quality and safety of patient care by:*
 - *Enabling the coordination of medications and therapies; and*
 - *Eliminating duplicative or otherwise unnecessary tests and procedures.*
- *Maintain the Greater Houston area’s preeminence as a worldwide leader in primary medical care, specialized services and scientific research.*

PRINCIPLES AND PRIMARY GOALS

- *Improve the efficiency, quality and safety of patient care by providing rapid but secure access to patient clinical data as needed by providers, regardless of care setting and status (private, public, for-profit, non-profit and safety net);*
- *Provide similar access to patients themselves (and their surrogates);*
- *Protect patient privacy; and*
- *Be self-sustaining.*

TIMEFRAME FROM INCEPTION TO SUBMISSION OF BOP

The following timeframe chronicles the development of GHHIE.

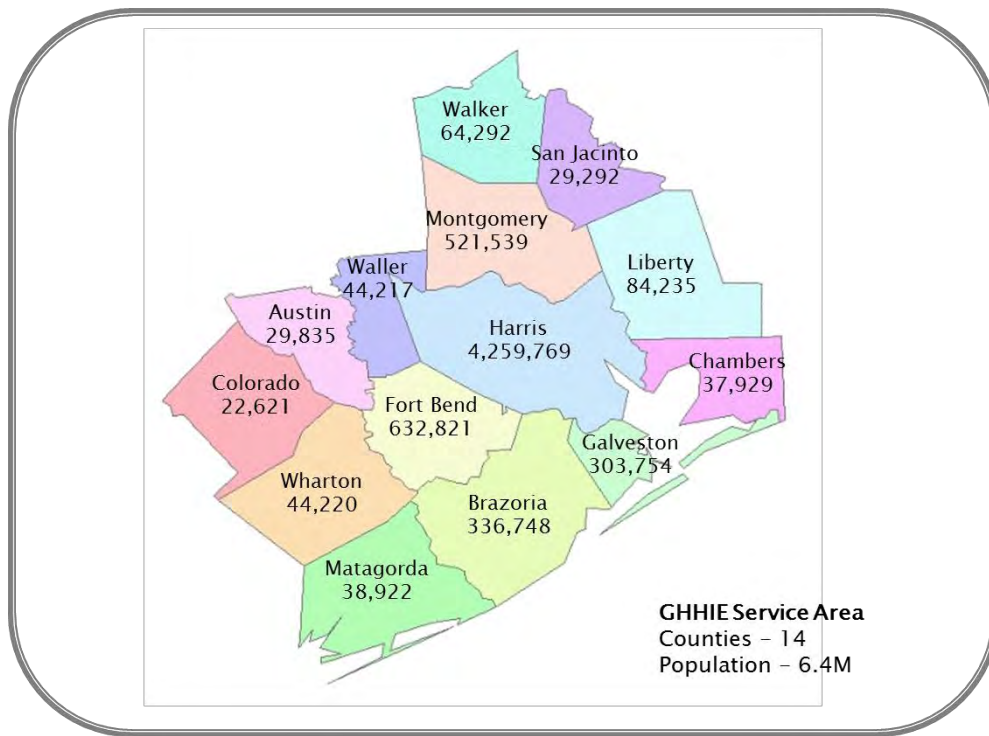
TIMEFRAME	ACTIVITY
2009	Conceptualized by the City of Houston, implemented by the Harris County Health Care Alliance and the Center for Houston’s Future
May - July, 2010	Convened Board of Directors and organized as a not-for-profit organization
Fall, 2010	Met with community to understand how HIE would provide benefit
Jan 13, 2011	Applied for Local HIE Grant Program Funds Planning Grant
Feb 8, 2011	Submitted 20% hospital and physician Letters of Commitment (LOC) to demonstrate provider engagement and qualify for the planning grant
Mar 11, 2011	Received preliminary notice of award
Apr 21, 2011	Contract and planning budget approved; grant awarded
Oct 18, 2011	Submission of Business and Operational Plan for implementation period

OVERVIEW OF MARKET

GHHIE will operate as a Regional Health Information Organization (“RHIO”), providing an umbrella and connectivity for hospital-based HIEs and other networks. GHHIE plans to provide HIE coverage for Harris County and thirteen adjacent and surrounding counties. This region covers a population of more than 6.4 million people; 13,436 physicians; 1,402 pharmacies; and 117 hospitals of all types (e.g., acute care, rehabilitation, psychiatric, long-term acute care). To date, letters of interest have been secured that represent more than 50% of the area’s hospitals; 77% of the beds, and all of the major healthcare systems as well as 40% of physicians.

The 14-county service area represents 24.29% of the total Texas population. The following map depicts each county by its projected 2012 population.

GHIE SERVICE AREA BY COUNTY NAME AND POPULATION



OVERLAPPING LOCAL HIE PROGRAMS

Significant collaboration occurred when the Galveston County HIE joined forces with GHIE by transferring its commitments and support to GHIE. There are still three other Local Planning Grant HIEs that share parts of the market area as illustrated in the following table. Collaborative efforts are ongoing to leverage resources, technology, and communication.

County	GHIE	iHealth Trust	Montgomery	SETHS
Austin	Green	Blue	White	White
Brazoria	Green	Blue	White	Purple
Chambers	Green	Blue	White	Purple
Colorado	Green	Blue	White	Purple
Fort Bend	Green	Blue	White	White
Galveston	Green	Blue	White	White
Harris	Green	Blue	White	White
Liberty	Green	Blue	Yellow	White
Matagorda	Green	Blue	White	Purple
Montgomery	Green	Blue	Yellow	White
San Jacinto	Green	Blue	Yellow	White
Walker	Green	Blue	Yellow	White
Waller	Green	Blue	White	White
Wharton	Green	Blue	White	Purple

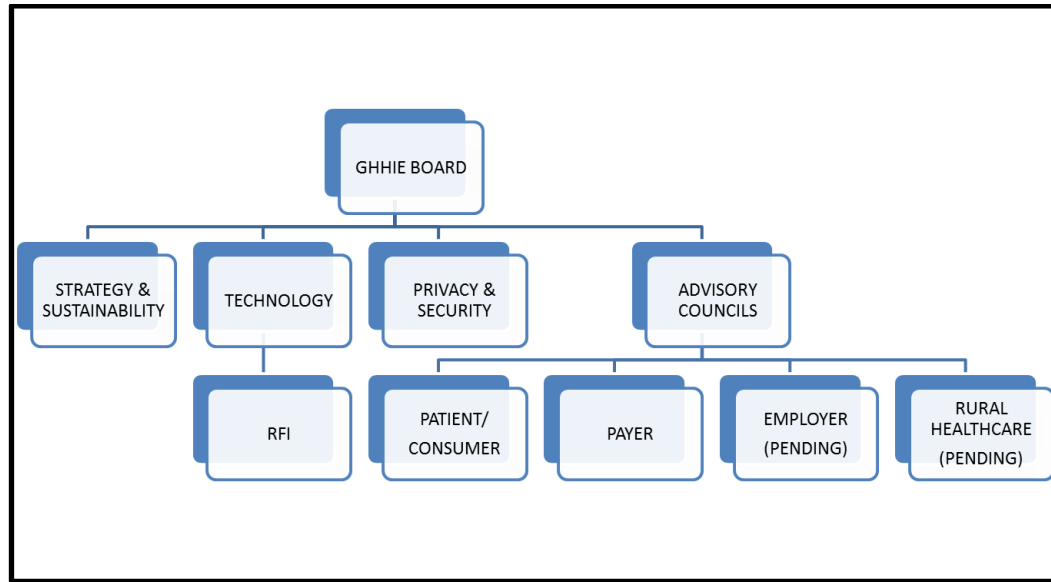
GOVERNANCE STRUCTURE

GHHIE Bylaws allow for 21 Directors. GHHIE currently has 18 Directors and is recruiting for additional Patient/Community and Employer representation. The initial Board was composed of eight business and community leaders appointed by the Center and seven healthcare leaders appointed by the Alliance. The Bylaws prohibit a healthcare representative from serving as the Chair.

BOARD MEMBER NAME	POSITION	APPOINTMENT DATE	REPRESENTING
Boom, Marc MD	EVP, The Methodist Hospital System	7/2011	Healthcare, large employer, lab
Born, Christopher	President, Texas Children's Health Plan	7/2011	Health plans, large employer
Conklin, George	SVP for IT, Christus Health	2010	Healthcare, large employer, IT, lab
Frison, Paul	Founder and EVP, Houston Technology Center	4/2011	Technology, community/patient, entrepreneur
Galatas, Roger	President, CEO Roger Galatas Interests	2010	Community/Patient, Montgomery County
Gilmer, William MD	Neurologist, Past President of Harris County Medical Society	2010	Medical Society, solo practicing physician
Harris, Bernard MD	CEO, Vesalius Ventures	2010	Technology, medical Informatics, entrepreneur
Herrera, Gilbert (Chair)	Founder, Herrera Partners	2010	Business, financial, community/patient, healthcare trustee
Jhin, Michael	CEO, Emeritus St Luke's Episcopal Health System	2010	Community/Patient, healthcare
Kempner, Shrub	President, Kempner Capital Management	2010	Financial, community/patient, Galveston County
Lopez, David	President and CEO, Harris County Hospital District	2010	Healthcare, lab, uninsured, large employer, community/patient
Mefford, Ruthanne	ED, Child Advocates of Fort Bend County	2010	Safety Net, community/patient, Fort Bend County
Mikhail, Osama PhD	SVP, Strategic Planning, UT Health Science Center	2010	Community/Patient, healthcare, higher education
Nelson, Ivo	Chairman of Encore Health Resources	4/2011	Healthcare, IT
Pritchard, Lamar PhD	Dean, College of Pharmacy, University of Houston	7/2011	Pharmacy, higher education, community/patient
Raimer, Ben MD	SVP, Health Policy and Legislative Affairs, UTMB	2010	Healthcare, large employer, lab, community/patient, Galveston
Spann, Stephen MD	VP for Primary Care Network Development at Baylor College of Medicine	2010	Medical School, practicing physician
Wilford, Dan	Former President and CEO of Memorial Hermann Health System	7/2011	Community/Patient, philanthropy

GHHIE's Board has the authority to confirm annual operating and capital budgets; appoint or remove officers; alter, amend or repeal the bylaws; sell, transfer or assign any of GHHIE's rights, titles, interests or licenses in or to its inventions, patents, copyrights, technical data, computer software, software documentation or any other intellectual or intangible property. It also appoints committees to carry out particular functions.

The following chart identifies the committees led by Board members with stakeholder participants that were established during the planning process. Multiple representatives from more than 20 organizations were actively involved. GHIE plans to leverage the commitment of the participants by converting the planning committees to implementation and operational groups. The Board of Directors would continue its role as described above.



The following schedule illustrates the timeline and breadth of involvement by stakeholders in the planning process.

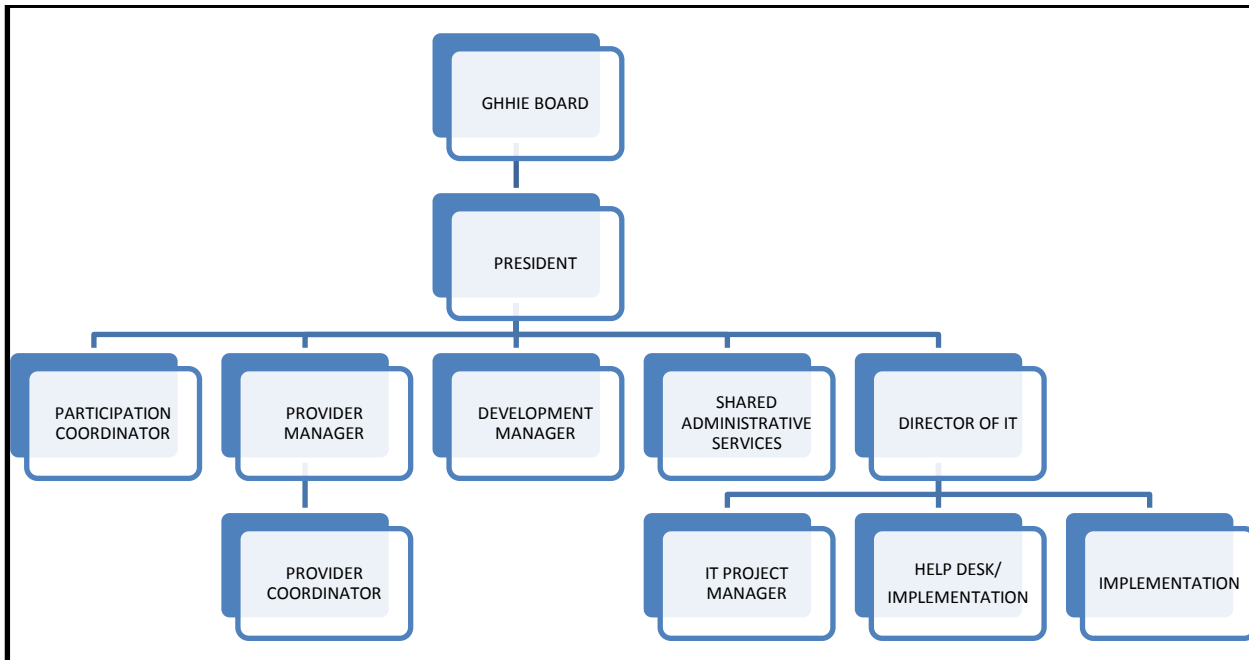
MONTH	DATES	ACTIVITY
June	27	Strategy and Sustainability Committee
July	7 21 28	Technology/Architecture Committee Strategy and Sustainability Committee Technology/Architecture Committee
August	2– 12 10 11 16 31	Vendor Informational Webcasts for Committees and Board Strategy and Sustainability Committee Technology/Architecture Committee Joint Meeting of Sustainability and Technology GHIE Board Meeting presentation of Committee recommendations
September	month 19, 29	RFI work group Privacy and Security Workgroup
October	3 7 12	Payer Consortium Patient/Consumer Advisory Committee Board Approval of BOP

STAFFING

Current GHIE staffing is provided by full- and part-time independent contractors. The organization plans to use a Professional Employer Organization (“PEO”) shared with the Alliance and recruit full- and part-time staff as indicated below. The expectation is that on-boarding in Years 2 and 3 will be based on maintaining close relationships with a large number of hospitals and providers over a 14-county area and any staffing additions will be evaluated carefully based on participation by providers. The following positions will be filled upon notice of implementation funding.

POSITION	FUNCTION	Y1
President	Reports to the Board; accountable for all HIE activities	1.00
IT Director	Reports to President; accountable for design, implementation and support of technical platforms	1.00
IT Project Manager	Reports to the IT Director: responsible for working with participants to develop benefits analysis; monitoring participation	1.00
Participation Coordinator	Reports to the President; responsible for participation agreements; legal liaison and Privacy	1.00
Provider Manager	Reports to the President; responsible for engagements and recruiting ; filled as work load requires	1.00
Development Manager	Reports to the President; responsible for identifying business and fund development opportunities as well as Marketing and Consumer relations	1.00
Provider Coordinator	Reports to Provider Manager; maintains THSA required files for commitments and local HIE records for participation; filled as workload requires	0.50
Help Desk/Implementation	Reports to the IT Director; serves as both provider liaison and support; filled as workload requires	1.00
Implementation	Reports to IT Director: responsible for implementation including work plans, metrics and go lives; will be filled based on workload	1.00
Shared support services with Harris County Healthcare Alliance	Allocations of Administrative Assistant; Receptionist; Finance; grant writing	1.00
Total		9.5

The proposed administrative reporting structure is reflected on the following chart.



PRIVACY AND SECURITY POLICIES AND PROCEDURES

In the development of its Privacy and Security policies and procedures, GHHIE has two major goals:

- Balance access, security and workflow efficiency ; and
- Leverage decisions and infrastructure of regional and enterprise HIEs.

GHHIE's approach to Privacy and Security can be summarized as follows:

- Engaged legal counsel familiar with Texas HIE requirements;
- Convened inclusive Privacy and Security workgroup to begin before technology decisions were made;
- Midway through developing language for inclusion in existing authorizations/consents for use for Treatment, Payment and Operations as well as form for expanded use;
- Legal firm created an Extranet to provide ability to submit documents and participate in chat sessions;
- Discussing Opt-In and Opt-Out approaches; and
- Goal is to have framework in place to move to Qualified Organization and Participant/End User Agreements by the end of 2011.

GHHIE must meet stringent privacy and security requirements to garner and maintain the trust of patients and providers. This bedrock commitment by GHHIE is essential to its success. Because GHHIE will begin operations and initiate data exchange in 2012, it has the benefit of the knowledge and experience gained in the evolution of privacy and security practices in other Texas HIEs and the information provided by THSA. This will enable GHHIE to start out with fully developed practices meeting all state and federal requirements, including HB 300.

APPROACH TO PRIVACY AND SECURITY

GHHIE considers its obligation to operate with strict standards of privacy and security to be paramount to the success of the organization. It sees these obligations as consistent with the goal of enabling higher quality and more efficient care through data exchange. GHHIE is developing its privacy and security policies and procedures through a series of collaborative sessions with multiple stakeholders including patient advocates, public and private hospitals, physicians, medical schools, safety net clinics, behavioral health providers and community volunteers. It retained legal counsel with expertise in privacy and security issues, including work with other Texas HIEs and THSA. GHHIE's counsel has apprised all stakeholders of the state and federal privacy requirements, including the Health Insurance Portability and Accountability Act ("HIPAA"), the Standards for Privacy of Individually Identifiable Health Information ("the Privacy Standards") promulgated by the U.S. Department of Health and Human Services ("HHS") at 45 CFR Parts 160 and 164, the HHS Security Standards set forth in 45 CFR Parts 160, 162 and 164, and the Health Information Technology for Economic and Clinical Health ("HITECH") Act, and the Texas privacy rules enacted through HB 300.

PRIVACY AND SECURITY POLICIES AND PROCEDURES

GHHIE will comply with all state and federal privacy and security standards, including HB 300, as adopted by THSA with respect to the exchange of protected health information ("PHI"). Its policies and procedures will encompass all legal requirements, and its participation agreements will require that all participants in the exchange will follow the same rules, where applicable. GHHIE will use the Nationwide Privacy and Security Framework for Electronic Exchange of Individually Identifiable Health Information's eight (8) principles as guidance and it will address its approach to these principles below.

1. Individual Access
GHHIE's policies and procedures will enable individuals to receive data held by or exchanged through GHHIE and/or participating organizations.
2. Correction of Information
GHHIE's policies and procedures will enable individuals to dispute the accuracy or integrity of their health information. If GHHIE holds the disputed data, it will make corrections where appropriate and note the disputation. If the disputed data is held by a participating entity, GHHIE will notify the entity which will likewise make corrections where appropriate and note the disputation.
3. Openness and Transparency

As a community-based organization formed by members of the healthcare community in partnership with civic and business leaders, GHHIE has operated with openness and transparency from the start. It has included a diverse group of stakeholders in numerous committees to obtain the wisdom and support of the broad community on whose behalf GHHIE works. It recognizes that transparency and inclusion will build trust in GHHIE, which is essential to its long-term success. GHHIE's policies and procedures are being developed through a collaborative stakeholder process and it will ensure that this information is always readily available to all.

4. Individual Choice/Authorization

GHHIE will strive to be certain that patients have a complete understanding of the kinds of information that may be exchanged, the possible uses of that data and the risks associated with data exchange. It will require an opt-in authorization and will provide information so that the patient can make an informed decision. Unless and until an authorization is executed and communicated to GHHIE, no identifiable health information about a patient will be exchanged, with the exception of circumstances permitted by law including "break the glass" emergencies. Patients will have the right to revoke prior authorizations and thereafter none of the patient's PHI will be exchanged through GHHIE.

As it begins operations, GHHIE will have two (2) authorization forms or language that participating providers may use, depending on the intended use of the exchanged PHI. One authorization will be limited to data exchange only for the purpose of treatment, payment and operations. Another authorization will permit the exchange of data for broader purposes, if appropriate and approved by participating entities, including retention in a central data repository for data analysis, research, quality improvement and public health purposes.

Initially, GHHIE will not enable granularity. Therefore, patients will be able to participate only if they authorize the exchange of all data, including HIV, mental health, alcohol and substance abuse data and other sensitive data which will be specified in the authorization form. In the future, GHHIE intends to add the capability to enable granularity so that data can be segmented in a manner that allows patients to authorize the exchange of some, but not all, of their PHI.

GHHIE will continue to work with THSA and the other local HIEs as the Attorney General develops an authorization form and will comply with any changes that may be required.

5. Collection, Use and Disclosure Limitations

Through its policies and procedures, GHHIE will limit the collection, use and disclosure of PHI to comport with the law and the patient's approval as expressed in the authorization. GHHIE will follow the law regarding emergency "break the glass" situations.

6. Data Quality and Integrity

GHHIE will work with its participants to ensure that data passing through the exchange is complete and accurate. Its participation agreement will address the obligations of members in this respect. Likewise, if GHHIE maintains clinical data repositories, it will work with the participants that send data to the repository to assure its integrity

7. Safeguards/Access/Authentication

GHHIE is developing a robust set of policies and procedures that will address the human, technological and physical requirements to assure that data is exchanged safely and securely and only between and among appropriate persons and entities. Its qualified organization and participation agreements will include rules governing access to data by these entities, their participants and employees or agents to ensure that there is no misuse or inappropriate access to identifiable health information. GHHIE will track violations and follow all laws regarding steps to be taken in case of a breach.

The process GHHIE intends to adopt to ensure that access is limited only to appropriate persons is as follows: To send or receive health information to, from or through GHHIE, a person must login to GHHIE. To login, a person must obtain an authorized user name and password. Only persons who have been authorized by an entity that is a party to a GHHIE qualified organization/participation agreement may obtain a user name and password. GHHIE will also have timed-out controls. GHHIE will build in the technical capacity to manage and monitor access and will perform audits to validate the system.

GHHIE may retain a clinical data repository for a subset of participants who choose to obtain this service through GHHIE. It will work with the entities using a repository to ensure that access to the data is strictly controlled and that privileges are established so that the repository remains secure and the data intact and uncorrupted.

8. Accountability

GHHIE will conduct oversight and audit activities to ensure that its employees, vendors and qualified organizations/participants are compliant with the law and the adopted privacy and security policies and procedures. It will participate in state-level audits to ensure the integrity of the system.

HB 300

As Texas HIEs and providers adjust their practices to comply with HB 300, GHHIE, as a new entity, will begin operations with policies and procedures that include the new requirements from the outset. Specifically, GHHIE will meet the requirements for patient access (described above); it will not sell PHI (per its agreement with THSA); GHHIE and its participants will provide compliant notice to patients about disclosure policies; and GHHIE will use PHI only as authorized by the patient (described above).

TECHNOLOGY

This section contains an overview of GHHIE’s organization approach to technology, key functions and technical approach. Assumptions regarding the healthcare delivery landscape are included. While the implications are not included in this document, GHHIE has discussed the potential shared use of the same HIE technology with other regional health information organizations. It expects to continue to pursue such discussions.

GHHIE has launched a process to select a technology partner that can help realize the vision of a robust regional health information exchange throughout the Greater Houston area. The Request for Information (“RFI”) process is structured to provide thorough review of the leading HIE vendors and their product/service offerings. After a rigorous selection process (described later in this section), GHHIE will contract for a hosted solution of software and technology, rather than make an acquisition. The schedule of RFI activities is designed to provide for a go-live date of Q1-Q2 of CY2012.

Evaluation criteria have been developed to provide a structure and framework for comparisons among the vendors. The selected vendor will have a demonstrated ability to perform in an environment similar to that of GHHIE. It must provide a comprehensive offering that gives GHHIE the ability to progress at its required pace (e.g., crawl, walk, run). Affordability is a major consideration, with GHHIE requiring a “pay as you use functionality” agreement with the vendor. GHHIE views the selection of a vendor as an opportunity for long-term partnering under a shared risk arrangement. GHHIE is also evaluating the potential for collaboration with other strategic HIEs.

Before an agreement is executed, approvals are required from the RFI Evaluation Panel chaired by Board member Dr. Lamar Prichard. The panel will consist of the CEO and several Board members as well as persons with technical expertise but without direct relationships or conflicts of interest with vendors.

To serve as good stewards and provide a cost-effective approach to HIE development, services will be sequenced as stakeholder demand dictates. In all instances, functionality required by THSA will be implemented.

Infrastructure and Core Services are considered base level services that must be included in the initial stages of HIE development. Such base level services will be implemented as a hosted, regional service in the first and second years of grant funding. Use cases will provide specific capabilities demonstration and address issues identified in the Use Cases portion of this Business and Operational Plan.

The RFI includes a specific requirement for interfacing with laboratories and pharmacies.

Value-added Services will be implemented as they are identified by stakeholders as providing benefit. Potentially, such services could be implemented in the first year of deployment if identified as attractive to stakeholder participants.

Future services may include a central data repository. Specific participants will drive implementation based on their identified needs for a repository.

OVERVIEW OF THE GREATER HOUSTON HIE APPROACH TO TECHNOLOGY AND STANDARDS

GHHIE’s organizational approach is to provide an electronic link between organizations that have health information technology capabilities and to provide a high value secured network and shared services to these organizations and their constituents along with providing access to those organizations which need assistance with technology. This approach deliberately builds upon and enhances the capabilities and investments that have been made throughout the Greater Houston area and seeks to leverage and expand efforts made to date. (Note: GHHIE is in the process of selecting a technology partner; therefore, the technical platform and standards described in this section have been communicated to potential vendors as requirements.)

GHHIE has agreed to facilitate the electronic exchange of health-related information consistent with the technical implementation specifications adopted by the THSA in accordance with the guidelines and standards adopted by the U.S. Department of Health and Human Services. This includes data exchange technical standards, policies, and procedures for exchanging health information between HIOs, RHIOs, and the THSA. Certain entities such as state agencies, large lab and pharmacy service providers, and insurance

companies may also be provided a means for connection to GHHIE.

In order to significantly limit cost and complexity, GHHIE will work with Qualified Organizations (QOs) to provide services to end users. From an end user point of view, this means that clinicians and other health information users will access GHHIE services through their existing organizations and associated health information capabilities. For clinicians that do not have access to an organization with a sophisticated health information capability, GHHIE intends to provide the services and mechanism through which they may access GHHIE services, which will include secure clinical messaging and other capabilities such as an EMR-lite.

Key components of the Greater Houston's HIE landscape include:

Greater Houston Health Information Exchange ("GHHIE"): GHHIE will provide a robust integrated regional health organization that will supply maximum functionality to its members. It supports an open, transparent, and collaborative process which creates policy guidance (i.e., "rules of the road") for the integrated health organization. GHHIE will provide infrastructure and core technology services as well as selected "value-added" services accessible via a regional HIE network.

Regional Policy Guidance: GHHIE is developing Policy Guidance to provide a common and consistent technical, privacy, security, and legal framework for participants in the HIE and ensure the secure, interoperable exchange of data through the network. Policy Guidance will include:

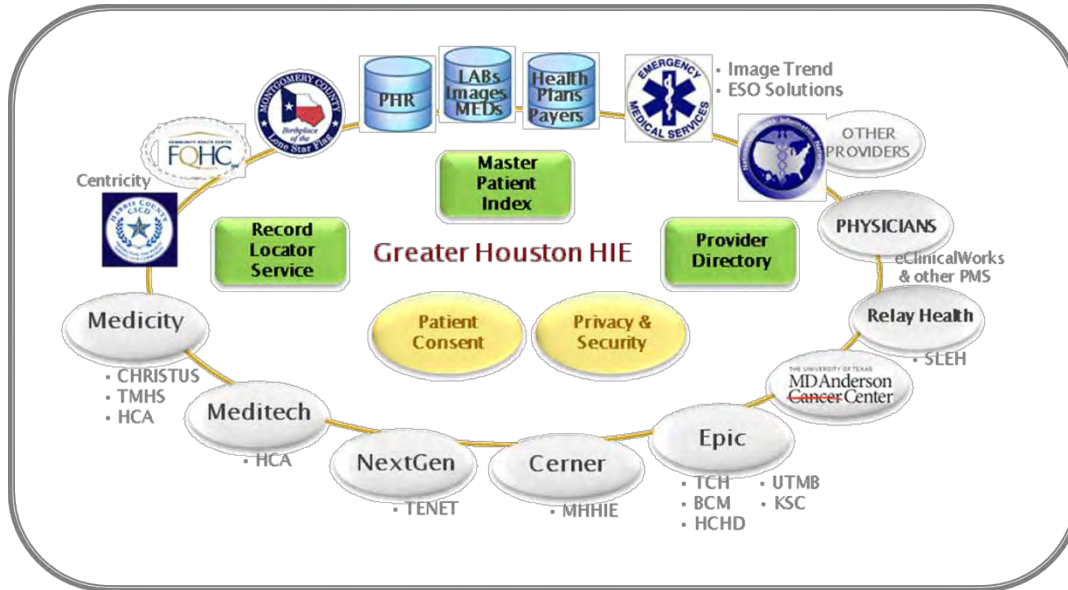
- detailed rules for privacy and security, technical interoperability based on standards, and financial obligations;
- technology partner requirements;
- ongoing governance structure and participation; and
- enforcement mechanisms.

Qualified Organization ("QO"): QOs are entities that have permission to access, consume and make available HIE services over the HIE network. QOs must meet a set of established criteria, go through an approval process, and sign agreements to abide by the Policy Guidance. QOs ensure that participants and Technology Partners with which they have contracts meet the requirements to carry out the policies.

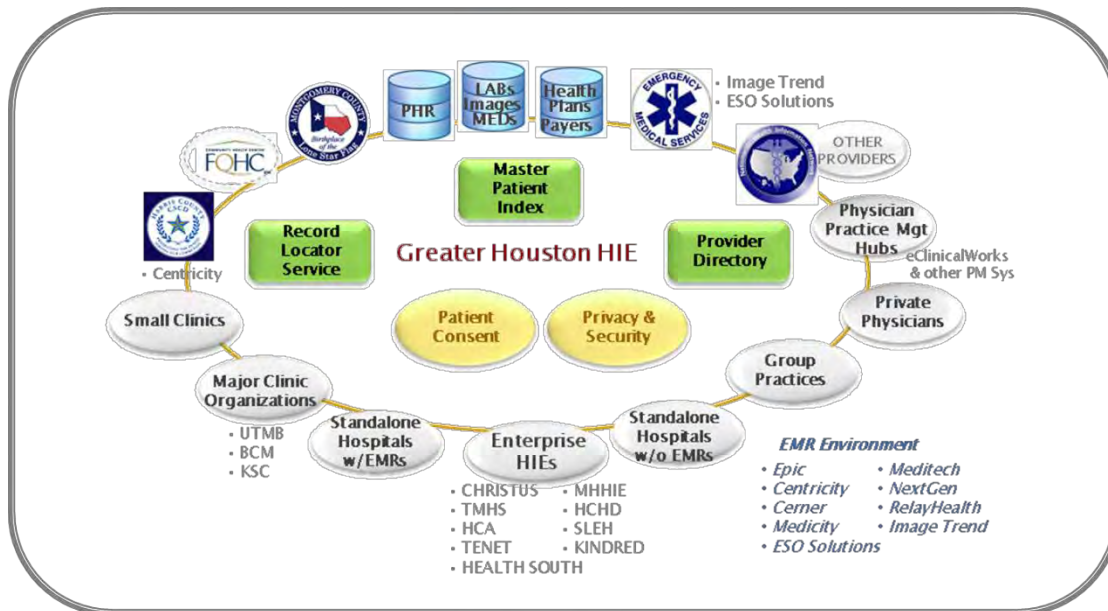
End User: A provider or other authorized user that accesses GHHIE services.

KEY ENTITIES & TECHNOLOGY RELATIONSHIPS

The connectivity landscape of the market is a complex range of technology from IDNs with enterprise HIE functionality to health systems with EMRs currently selecting or implementing HIE functionality to those providers in the process of implementing EMRs. The next diagram depicts the vendor perspective for the HIE connectivity.



The following diagram depicts the market from the view of the type of organization to be connected.



OVERVIEW OF THE GREATER HOUSTON HIE TECHNICAL APPROACH

The functional Greater Houston area HIE is designed to be a collection of “nodes” that work together to achieve common purposes based on an agreed-upon set of priorities, policies, and technical specifications. As illustrated in the previous diagrams, within this system of systems, there are multiple entities (e.g., local provider entities using an EMR, regional networks, large hospital systems, insurers, state agencies, and other commercial healthcare enterprises) that provide and consume data.

These entities (each of which is required to comply with the HIPAA and HITECH privacy and security rules, including encryption, may have their own health IT systems and networks utilizing different technologies, and have differing priorities and approaches regarding the data they collect and transmit. The regional HIE is not intended to supplant these networks, but rather is a flexible, open, cost-effective framework supporting the inter-organizational exchange of data and access to shared services in a manner that meets privacy and security requirements of HIPAA and HITECH.

As described previously, GHHIE will establish HIE services to facilitate the exchange of information among these Qualified Organizations that voluntarily participate in the exchange. It is assumed that Qualified Organizations will exchange health information among their constituents and will need a secure pathway and a process to exchange information with other Qualified Organizations, state and national agencies and/or providers, intrastate HIEs, and other information sources to be determined.

GHHIE’s technical architecture will prioritize the local exchange of healthcare information. However, it believes that great value will also accrue from sharing non-local encounters, enabling emergency access to clinical information, facilitating clinical decision support, and populating public health databases.

GHHIE believes in the importance of data quality and the integrity of its projects. Therefore, GHHIE will work diligently to require the accurate import of participating organizations’ data into its environment and will work to evaluate the completeness of data provided by all stakeholders and aid in the remediation of any issues.

In addition to connecting with other HIEs and the white space contractors to facilitate data exchange across regions, GHHIE has agreed to collaborate with the following stakeholders:

- **Texas Health Services Authority (“THSA”)** – GHHIE intends to continue to participate in ongoing state-level planning and policy development through the Collaboration Council and policy development task forces.
- **Texas Medicaid Program** – GHHIE is committed to collaborative activities with the State Medicaid program, including the exchange of medication data for Medicaid program clients.
- **State and Local Public Health Agencies** – GHHIE is currently working with local health departments and intends to expand this collaboration to the State health department as requested by that agency.
- **Regional Extension Centers** and other Health Technology Programs funded through ARRA. GHHIE is committed to working with all entities within its service area to standardize and coordinate the exchange of information to providers and rural hospitals.

As new organizations are enrolled, GHHIE will assess the risk associated with data collection interface mechanisms and source systems to determine the most appropriate mitigation strategy. GHHIE’s approach will include the following:

- Incorporate data quality and integrity processes into a data integrity plan, which addresses provider workflow issues, interface issues, data matching algorithms and other technology and business process procedures that impact data quality and integrity.
- Use data dashboards to track HIE operational measures related to data integrity such as number of duplicate records and interface error management.

GHHIE’s framework for hosted shared regional HIE services consists of three (3) categories of services: Infrastructure Services, Core Services and Value-Added Services. It also requires supporting services from a Technology Partner to deploy and operate the infrastructure, core and value-added services.

GHHIE will provide a set of Infrastructure and Core Services that support connectivity and secure data transport exchange between multiple entities and systems in the Greater Houston area. The goal of the Infrastructure and Core Services is to provide a lightweight and flexible infrastructure and serve as the gateway through which authorized organizations securely access Value-Added Services.

Infrastructure and Core Services create a foundation for organizations and participants to exchange health information across their organizational boundaries, so that two entities can:

- Identify and locate each other in a manner they both trust;
- Reconcile the identity of the individual patient to whom the information pertains;
- Exchange information in a secure manner that supports both authorization decisions and the appropriate logging of transactions;
- Measure and monitor the system for reliability, performance and service levels; and
- Meet HIPAA requirements for accounting of uses and access to Protected Health Information (“PHI”) and auditing access to PHI through the exchange.

The Infrastructure Services assure authentication of the requestor before enabling a request for information and authorization of the clinician to view the requested information and provide the capacity to audit viewing by requestors.

INFRASTRUCTURE SERVICES

Infrastructure Services include the following:

- 1) **Security Services:** Security services consist of multiple functional processes ensuring that only authorized users are able to access system or service resources, and that allow for system administrators to review and assess the effectiveness and consistency of these processes. The processes must also adhere to state and federal privacy and security standards. Access begins with a secure Web interface that conforms to security design standards. GHHIE will employ a role-based access control scheme (“RBAC”) for assigning permissions to users. Access management includes authentication (the validation of user identification within the system with a user login ID and password, plus additional factors as required), and authorization (the authorization approval process for data access as well as the system implementation of access permissions and restrictions using the RBAC), and provisioning (the activation, review, and deactivation of user accounts based on authentication and authorization processes). An audit trail, consistent with the Integrating the Healthcare Enterprise (“IHE”) profile and Audit Trail and Node Authentication (“ATNA”) profile, will be established across components in order to detect event anomalies from authorized user activities and attempts from unauthorized users.
- 2) **Provider Directory:** Directory includes services for locating providers by facility location and unique identifier and may include interdependent master facilities and master clinician indices.
 - **Master Facilities Index:** This component is an index of facilities with which the clinician (or other user) registered in the State of Texas has an affiliation/relationship. It processes additions, deletions, and updates to the facility index and processes requests for information from the facilities index.
 - **Master Clinician Index:** This component is an index containing all relevant information on all registered clinicians within the Greater Houston area. It processes additions, deletions, and updates to relevant clinician information, and will process requests for relevant clinician information. “Clinician” is broadly defined to include all certified and licensed clinicians (e.g., physicians, nurse practitioners, nurses, certified nursing assistants, medical assistants). The Master Clinician Index Service will be an open and authoritative region level provider directory accessible to all Qualified Organizations in the Greater Houston area.
- 3) **Message/Record Routing/Return Receipt:** Enables participating providers to securely exchange key clinical information between their EHR systems (e.g., accept and route continuity of care documents [“CCD”s] between connected providers). Messaging and Record Routing must adhere to Direct Project and IHE standards.
- 4) **Identity Management and Authentication:** It is also necessary to detect and authenticate the entities that are connecting. This is frequently handled through digital certificates that uniquely identify the certificate holders and prove to the HIE that the systems interacting are trusted sources. The services will include an index of participating entities (or Qualified Organizations) which will include organizational details. It will store participating entity rules (based on data sharing agreements) to enable the sharing of clinical records. Federated identity management will be established to enable authorized users from participating entities to interact with GHHIE. Information involved in protected transactions includes but will not be limited to roles, patient authorization, participating entity provisioning, entity de-provisioning, auditing transactions, reporting transactions, compliance with policies and procedures, authentication of participating entities and certificate authority.

- 5) **Transaction Logging:** Maintains a transaction log that can facilitate audit of transactions. The transaction log will track the origination and destination of an information transaction and verify that the transaction was completed. The transaction log will facilitate the audit requirements set forth by GHHIE.
- 6) **Authorization Management:** Provides a technical solution to facilitate authorization policies and patient preferences. GHHIE's technology partner will need to be flexible regarding authorization and will be expected to provide capability to facilitate authorization policies for multiple authorization models as well as a capability to manage authorization between GHHIE and Qualified Organizations. GHHIE will also require the ability to provide system-wide capability to restrict access to specially-protected data according to state and federal law, including substance abuse.
- 7) **Terminology Services:** Capability to provide translation between various medical vocabularies in clinical records, to provide LOINC encoding for lab results according to HHS standards, and in later phases to provide mappings and encodings for all meaningful use standards as specified by HHS (e.g., LOINC, SNOMED-CT, RX-Norm, etc.).
- 8) **Transformation Service:** Capability to provide transformation between different document formats (e.g., HL7v2 to v3 or EDI to XML), to parse and validate various document formats (e.g., XML and XDS), and to create and map across different message envelopes and content requirements based on source and target requirements. *(Note: All interfaces between GHHIE and Qualified Organizations are anticipated to be IHE profile driven and certified.)*
- 9) **EMPI/Patient Matching/Record Locator Service:** This service provides three (3) capabilities.
 - The first capability is a reconciliation service that matches (i.e., cleans up) records from existing systems to provide a definitive mechanism for locating all records for a patient. This is usually accomplished via a probabilistic algorithm with optional manual resolution when the algorithm fails. Records may stay in the existing system, or some or all of those records may be moved or copied into this service's storage. During implementation, various design patterns will be considered including: keeping records in their current location with the possible exception of limited demographic data, centralizing or developing master indexes, or distributing and synchronizing indexes. Specific design choices will be based on participant capabilities and enabling HIE functions.
 - As the person/patient identities are being indexed specifically for the HIE, a second capability enables requesting a list of patient information documents or clinical data locations using this index, either via a demographic attribute query (i.e., find all patient info for the patient with <name, date of birth, ...>) or via a direct index lookup if the querying system has the patient index available.
 - The third capability enables requesting one or more of the documents listed from a query be transferred to the requester's system.

The second and third functions described utilize the person/patient matching service and may be exposed as part of the clinical document exchange service described in the Value-Added Services section below.

- 10) **Document Registry:** The document registry is a data repository that contains an identifier and location of documents and patients stored in participating Qualified Organizations. It does not contain clinical information. Data is populated in the Document Registry by the Record Locator Service ("RLS"). When a provider queries for documents of a given patient, the RLS will search this registry and return a list of documents and their locations found for the patient that are located in the Qualified Organizations.
- 11) **NwHIN Gateway:** The NwHIN Gateway provides for a single implementation of the NwHIN Connect gateway available as a web service for authorized users and entities. This service is the required standard for interoperability with federal agencies, and the proposed standard for the exchange of clinical information across the NwHIN.

Qualified Organizations will utilize Infrastructure and Core Services to access an evolving range of Value-Added Services offered by QOs, technology partners, other organizations or GHHIE itself. The availability of Value-Added Services will be based on the needs of GHHIE's constituents.

CORE SERVICES

Core Services, as required by the THSA Enterprise Architecture Blueprint, include the following:

- **Clinical Messaging** - A provider creates a secure message and sends it to another provider within the Greater Houston area network or outside GHHIE via the Direct Project.
- **Continuity of Care Document Exchange**
- **Summary Record - CCD/CCR Exchange** - This service is a specific implementation utilizing core services that enables organizations to exchange clinical summary documents in either Continuity of Care Document (“CCD”) or Continuity of Care Record (“CCR”) format. Organizations are responsible for being able to generate and receive the clinical content. The service may consider enabling several models of exchange. These include event-driven messaging patterns where a change in patient status, such as a patient being admitted to a hospital, results in an event handler then delivering the message to recipients that have message queues established to handle the notification. Alternatively, the exchange service may support a more traditional query/response interaction where authorized applications may query it for the patient document.
- **Lab Information**
- **Lab Ordering** - A service to route orders. (Note that orders are generated in a provider’s ordering system.)
- **Lab result delivery** - Lab creates a results transaction set (e.g., Test Results, Comments, Normal Range (optional), Pathology Data (optional), Other Segments (optional), Performing Lab Information, “Copy To” information). Lab sends results transaction set to HIE.
- **Electronic Prescribing**
 - Provider completes encounter in EHR.
 - Provider accesses e-prescribe service and sends prescription.
 - The e-prescribing service processes the prescription and sends it to the pharmacist. (Note: May be faxed or electronic.)
 - The e-prescribe service sends the data to the HIE.
- **Patient Portal**
 - Provides patients the ability to interact and communicate with their healthcare providers, such as physicians and hospitals via the internet.

By consolidating access to Value-Added Services through the Infrastructure and Core Services, GHHIE will be able to share and minimize operational costs, increase user participation, and maximize benefits to all stakeholders.

VALUE-ADDED SERVICES

GHHIE’s priority for developing regional HIE services is to meet both the immediate needs of providers to satisfy Meaningful Use requirements and the longer-term transformative vision for its healthcare system, moving toward patient-centered models supportive of robust coordinated care. Value-added services will be accessed via the regional HIE infrastructure and core services.

In July and August 2011, the Strategy and Technical Advisory Committees identified a list of candidate services to be offered as hosted shared services. Based on a thorough analysis of each candidate value-added service, the Strategy and Technical Advisory Committees proposed a recommended sequence of implementation of hosted shared services. Candidate services were assigned to one of three categories:

- **Phase 1:** Implement as a hosted, regional service in the first year of deployment.
- **Phase 2:** Implement as a hosted, regional service in the second year of deployment.
- **Not Phased:** GHHIE has not yet determined whether to provide the service, and if so, when to phase the service.

Phase 1

- **Radiology/Imaging Information**
 - Radiology results delivery - A service that facilitates the secure transmission of radiology results to the appropriate location.
 - Radiology image delivery - A service that facilitates the secure transmission of radiology images or other diagnostic images to the appropriate location.
 - Procedural results delivery - Delivery of additional value-added procedural tests (e.g., EKG, ECG).
- **Medication History** - Retrieves and aggregates a medication history including retrieval and aggregation of prescription (new, refills, etc.) information from identified sources (e.g., SureScripts, others) to medical providers, including pharmacists.
 - Patient presents for care.
 - As part of the intake process (regardless of setting), provider queries for “medication history.”
 - Provider reviews the information and identifies medications prescribed but not filled, potential interactions, medications to continue/discontinue, refills, etc.
 - Provider diagnoses and treats patient in appropriate manner.
- **Presentation Layer/Portal (EHR-lite)** - Provides providers, without an EHR, the capability to view clinical information via GHHIE and to receive secure clinical messages via GHHIE.

Phase 2

- **Payer Information**
 - Eligibility check - A central access point for EHRs and practice management systems to retrieve insurance eligibility information via EDI transactions across various payers. This service would facilitate electronic eligibility checking and the fulfillment of the corresponding Meaningful Use criteria for the users and vendors of EHR systems, suggesting a revenue model for sustainability. In concert, the same access point may be used to enable web-based access to eligibility information for those eligible providers as yet unable to take advantage of EDI transactions (primarily small physician practices). Current EHRs create an eligibility check request (X.12) and send it to Clearinghouse, which will check against connected payers and get information back.
 - Prior authorization –
 - Payers and PBMs publish specific authorization requirements using a specification.
 - Provider systems use prior authorization flags to alert authorization requirements.
 - Providers send needed information in the format of an electronic prior authorization request.
 - HIE submits electronic prior authorization requests to Payer/PBMs using the XI.2/278 transaction, including appropriate patient information (diagnosis/conditions).
 - Payer/PBMs respond using the 278 response, and potentially note the authorization result in the claim adjudication system.
- **Patient/Consumer Empowerment** - These use cases may be enabled or facilitated via health information exchange core services, in that core services are designed to be building blocks for new functions and applications.
 - Provider sends a clinical summary of an office visit to the patient/caregiver
 - Provider sends reminder for preventive or follow-up care to the patient/caregiver
 - Provide Advance Directives to requesting providers
 - Provide patients access to request prescription refills online, access medical records, pay bills, review lab results, and schedule necessary medical appointments.

Not Phased

- **CCD Translation** - This service will offer a centralized clearinghouse for transforming clinical summary documents among providers and patient-designated entities. This service would be analogous to the laboratory-routing clearinghouse, and would enable organizations that may lack standards-compliant EHR systems to also exchange clinical summary data. This service will allow for the clinical summary exchange for care coordination capability and the capacity for the translation of legacy messaging to standardized CCD and/or CCR.
- **Lab Information (Enhance Capability)**
- Lab normalization - A service to transform laboratory order and result messages to conform to the format, coding, and transport requirements of the receiving EHR or public health agency. Vocabulary services, including access to/mapping of LOINC, SNOMED, etc. could be a combination of local and central services. GHHIE's role could be to negotiate preferred rates with companies that offer vocabulary services.
- Routing of lab results for required reporting - This service will provide a centralized clearinghouse that will route laboratory reports to public health and other agencies as mandated by federal and state laws and in accordance with national standards and specifications. The centralized routing service is intended to replace the numerous, point-to-point connections among laboratories, EHRs and public health databases with a single routing hub connected to participating entities.
 - Lab creates the Public Health Lab Results Transaction Set in its LIS/HIS, which includes:
 - Test Results
 - Patient Demographic Data
 - Comments
 - Normal Range (optional)
 - Pathology Data (optional)
 - Other Segments (optional)
 - Performing Lab Information
 - Lab sends Public Health Lab Results transaction set to HIE.
- **Public Health Electronic Submission** - Submit de-identified information for public health and quality improvements. Public Health receives results and incorporates them into its records.
- **Immunization Data**
- Access to immunization data - A provider requests immunization data from the state registry.
 - Provider requests immunization data from the HIE.
 - The HIE submits request to the State Registry and receives the data.
 - The HIE forwards the data to the requesting provider.
- Immunization reporting - Provider EHRs would send immunization information to the HIE for routing to the appropriate registry (Note: This service is information routing, not a service for providing registries):
 - Provider may register a patient's immunization information for sharing (make it or its source known).
 - Provider may use the HIE Service to locate a patient's immunization information.
 - Provider may retrieve a patient's immunization information.
 - Provider may recommend next immunizations.
 - Provider submits a patient's immunization information to the exchange through the EHR.
- **Quality Reporting** - Provider or hospital reports quality measures via HIE to CMS or State.
 - Provider creates quality report from EHR system.
 - Provider's EHR sends quality report to the HIE.
 - HIE forwards Quality Report to appropriate receiving system at State or CMS.
 - State or CMS receiving system processes the report and provides feedback directly to the provider.
 - Note: Quality reports include PQRI, CQM, disease and implant registries, and others.

- **Disease Surveillance Reporting**
 - Disease surveillance reporting to local public health and state agencies - A provider or hospital sends (i.e., reports) anonymized chief complaint data, including a problem list, to state or local public health agencies as part of a syndromic surveillance program. (Note: This service is information routing, not a service for providing bio-surveillance.)
 - Hospital EHR systems collect data on patient’s chief complaints as part of regular provision of care.
 - The provider or hospital has made the determination that it is clinically and legally appropriate to send the chief complaint data to Public Health agencies.
 - Patient’s chief complaint data is communicated to Public Health agency on a pre-determined schedule (with capability for ad-hoc transmissions also.)
 - Disease surveillance reporting to CDC - State public health agency reports public health data to Centers for Disease Control (“CDC”).
 - State determines data set for identified conditions based on Nationally Notifiable Disease Condition reports to be reported to CDC.
 - Authorized personnel use HIE functionality to send information to CDC.

- **Aggregate Data for Research Purposes**
 - Access to aggregated data for authorized queries.
 - Access to individual patient care data and/or anonymized data for quality improvement, clinical research, recruitment for clinical trials, comparative effectiveness efforts, etc.

- **Provide Tools to Enhance Delivery of Care HIE Service**
 - Clinical Decision Support - Provide decision making around diagnosis (clinical prediction rules), prevention, and disease management (routine care reminders to doctors or patients) based on a comprehensive patient record from multiple sources.

In summary, GHHIE has identified an initial set of value-added services that it would like to offer. Initial phasing has been identified but is flexible. In addition, GHHIE is interested in investigating other services that have not been presented here (e.g., Medical Home Strategies, Credentialing Data Aggregation, etc.). Based on stakeholder priorities and reluctance to participate in a shared clinical data repository, that functionality is not included in Core Services. It would be considered for Value-Added Services if proposed by participants as a viable addition. Many of the “Not Phased” services would require CDR availability.

SUPPORTING SERVICES

The following supporting services will be implemented as the underlying base necessary to enable an integrated Health Information Exchange.

- **Systems Environments:** Includes the ability to maintain appropriate environments for development, testing, training, and production.
- **Hosting Services:** Includes the technical infrastructure and services needed to run, maintain, and support service delivery.
- **Training:** Includes training of end users and administrators within GHHIE and each Qualified Organization. A training plan that covers user training, ongoing technical assistance training, workflow re-design, and troubleshooting will be developed.
- **Help Desk:** Includes hardware and network support and maintenance and may include, but not be limited to, maintaining the physical GHHIE infrastructure (core systems, edge servers, network interfaces, telecommunications, etc.), ensuring system security, software support and maintenance, operations support, and reporting.

ROLLOUT AND INTEGRATION PLAN

GHHIE envisions a leveraged approach to rollout of services and integration. This means that GHHIE will build upon and strengthen the capabilities already in place throughout the region’s qualified organizations, relying upon each qualified organizations’ capabilities for on-boarding, connecting, training, and supporting its providers. The approach ultimately enables operationally- and cost-efficient integration of providers through a limited number of connections between GHHIE and the QOs.

All service options and HIE functionality are anticipated to be available to each QO, but not necessarily utilized on the initial go-live date. Therefore, the QOs are anticipated to utilize infrastructure and core services and may choose to use selected value-add services based upon their individual needs

TECHNOLOGY PARTNER SELECTION

GHHIE will select a technology partner to enable the technical landscape and services described above. GHHIE recently released a Request for Information (“RFI”) to sixteen (16) vendors and plans to engage in a rigorous process to select the appropriate Technology Partner based on the following criteria:

- Demonstrated ability to deliver in a similar environment
- Comprehensive offering providing GHHIE the ability to evolve its service offerings
- Affordability (provisioning pay-as-used functionality)
- Long term partnering opportunity (with potential for risk sharing)
- Potential to collaborate with other strategic HIEs

The RFI was developed by a work group composed of technology/business leaders of key stakeholders; will be evaluated by a separate group of technology/business leaders from key stakeholders; and selected by a non-partisan group that includes academia, physician leadership, chaired by a Board member. Upon completion of all RFI process steps, GHHIE will select a partner and proceed with remaining negotiation and contracting steps.

INTERIM OPERATIONS

GHHIE will investigate opportunities to enable operations with Direct Project capabilities to begin operations in early January 2012 while the selected Technology Partner is readying the long-term solution for rollout. This will enable early adopters to start using functionally to communicate and share information in the region. It will also begin to provide proof points that can be shared with major stakeholders.

SERVICES

STAKEHOLDER NEEDS

The following information from the *eHealth Initiatives Toolkit* is representative of the results of GHIE’s environmental scan of stakeholder needs in the Greater Houston market.

STAKEHOLDER	NEEDS
Hospitals and Health Systems	<ul style="list-style-type: none"> • Provide interfaces between hospitals and unaffiliated physicians • Automatically notify providers and payers when their patient/member is admitted/discharged • Drug-drug interactions • Enhanced ED/EMS information • Redundant test elimination
Providers	<ul style="list-style-type: none"> • Meaningful Use support • Provide portals with patient-centric views • Process for capturing data (begin with scanned document if necessary) • Support automated reporting of Pay-for-Performance (P4P) measures to payers • Reduce amount of time spent sorting and dealing with fax paper • Reduce amount of time spent scanning results into the EMR
Patients Consumers	<ul style="list-style-type: none"> • Ability to have data transferred between all caregivers • Potential cost savings through reduction of duplicate tests and doctor appointments • Time savings during medical visits due to elimination of redundant tests and physicians having all necessary information • Ability to view historical information and create a PHR • Balance access with privacy and security
Payers	<ul style="list-style-type: none"> • Support case managers in managing transitions through real-time notifications of discharge and admittance • Assist in responding to the individual marketplace for portals • Streamline the prior-authorization and referral process
Purchasers Employers	<ul style="list-style-type: none"> • Purchasers and employers have the potential for lowering insurance costs and improving employee health and attendance through more complete access to information through the use of health information exchange

GAP ANALYSIS

In February 2010, the Health Care Policy Advisory Committee of the Greater Houston Partnership released a white paper, **“A Region in Crisis: A Call to Reduce the Uninsured and Expand Access to Health Care in the Ten-county Houston Region.”** An excerpt from the opening section describes the Greater Houston region and its healthcare challenges.

The Houston region is fortunate to have the world’s finest physicians, hospitals, and nurses. The Texas Medical Center, often cited as the birthplace of leading edge technology and progressive clinical treatment, is an enormous source of pride and accomplishment for all residents of the Houston region.

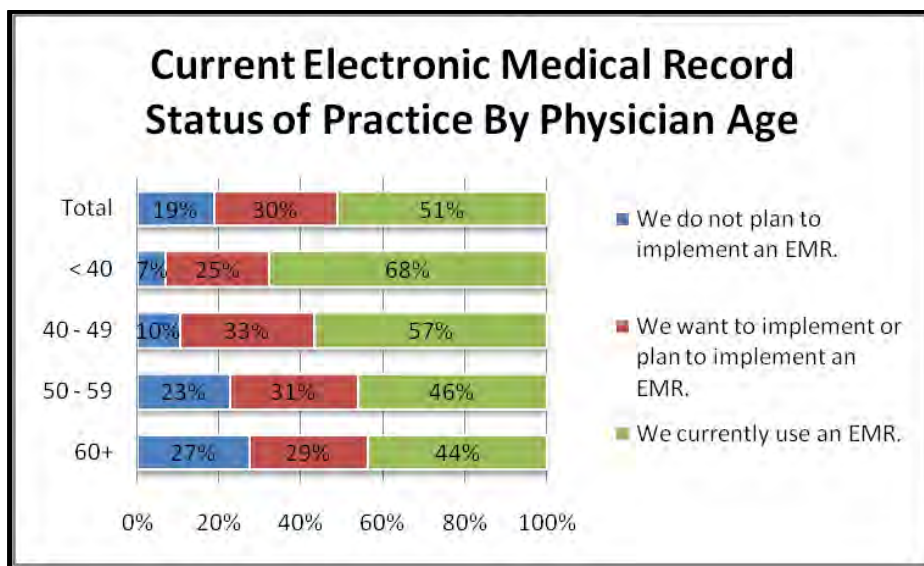
Yet, within the region, a huge dichotomy exists – the very place that provides world-class care is the same place in which over one-third of the population has inadequate access to it. As a result, the Houston region is in the midst of a health care crisis – one which will not only affect the health of most Houstonians and their neighbors, but also one which will threaten the economic viability and quality of life currently enjoyed by its residents.

*The crisis consists of two inter-related issues related to access to and cost of health care that must be addressed simultaneously:
 The highest rate of healthcare uninsured in the country; and
 An over-burdened, fragmented safety net provider system for the uninsured/medically indigent.*

The factors which have caused this crisis are numerous and complex, but solvable. This is a regional problem that can only be solved through collaborative initiatives undertaken by all stakeholders – government, health care providers, businesses, faith-based organizations and others. Unless the community begins to address the issues that are at the root of the problem, the health care crisis in the Houston region will continue to escalate.

GHIE’s provision of an electronic health information exchange is precisely the type of collaborative effort that can address these community challenges. Because data typically resides with the individual providers, it is difficult to assemble a complete health record. Although some hospitals may have fairly robust databases, it is impossible for physicians to access complete records through a hospital-based system due to the lack of a single portal to provide a patient-centric view of information regardless of where the services were provided.

This issue is compounded by the number of physicians who do not have access to electronic medical records. Information from the *Texas Medical Association’s 2010 Survey of Texas Physicians* indicates that 51% of physicians use practice EMRs. The survey revealed no statistically significant differences between physicians in different specialties and different locations and EMR adoption.



Locally, the Harris County Medical Society has studied the adoption of EMR for area physicians and learned that practice size can play a significant role. Smaller practices often do not have the financial wherewithal to purchase EMR technology, nor do they have the personnel required to sustain such an investment, particularly since most practices do not have in-house IT support. Even if the resources existed, these small practices would be hard-pressed to survive the downtime required for implementation. This disruption of business could prove financially devastating to the practice.

Approximately 50% of the physicians in the Greater Houston market practice in groups of fewer than five physicians. They represent the majority of the physicians who have not yet implemented an EMR. This barrier to achieving Meaningful Use with its required ability to electronically exchange information has definite implications for the physicians. GHIE has identified this area as one in which it could provide functionality to assist physician practices in meeting Meaningful Use requirements.

COMMITTEE FINDINGS AND RECOMMENDATIONS

In June, 2011 GHHIE's Board appointed Directors and stakeholders to a Strategy and Sustainability Committee. Its charter was to recommend a functional model for GHHIE that would provide services to meet the information exchange needs of the community in a sustainable manner.

The Committee identified success factors that are critical to the successful start-up and sustainability of an electronic health information exchange in the Greater Houston area. The factors include:

- Aligning priorities between GHHIE and all stakeholders, including payers, patients/consumers and employers;
- Establishing an identity that conveys GHHIE as a trusted and neutral entity that protects the interests of all participants;
- Focusing on value propositions and the business case for key activities;
- Demonstrating a core competency of understanding clinical workflows and managing change; and
- Understanding the service area dynamics and its potential effects on HIE development and implementation.

The Committee developed strategic recommendations that create value for stakeholders. This might take the form of the following assistance to providers:

- Achieve Meaningful Use;
- Improve efficiency through improved workflow; and
- Enhance quality by providing information at the point of care.

To support provider engagement with patients, GHHIE plans to:

- Provide secure portals that protect patient privacy and confidentiality;
- Enable access to data from disparate sources;
- Support communications between providers and patients; and
- Provide Personal Health Record interoperability.

To provide connections in the area's fragmented healthcare system, GHHIE will provide the tools to help providers and patients manage chronic care conditions. This is expected to deliver results in the form of a healthier community and a more effective healthcare model by reducing emergency room visits and coordinating care across the healthcare continuum.

GHHIE expects to mature into a model that will provide analytical capabilities around clinical decision support, collection of quality and outcomes data, and population health management.

At inception, GHHIE will provide an information exchange by providing connectivity without creating a shared data repository. Each query will occur in real time and no data will be warehoused on a centralized comprehensive database.

Connecting to third party labs is not a high priority for health systems with their own robust labs. However, these lab results are far more important to independent physicians.

There is strong consensus over the importance of providing medication history. This has been identified as a key component by stakeholders.

Another common theme is concern about Emergency Departments and the impact of the uninsured population. To improve the quality of care and reduce costs, connectivity is required to link medical homes, local EMS providers and FQHCs to Emergency Department records. Identifying chronic conditions and inappropriate use of the ED as a primary care center can form the nucleus of a system that helps patients get the right care at the right time at the right location by the right provider.

Image sharing is a priority for physicians and hospitals. In the Texas Medical Center, a program is underway to develop common pricing with a single vendor to enable electronic transmission of high-quality images between TMC providers. Preliminary results show that it is possible to share these images electronically, saving time and avoiding the courier costs that resulted from the previous system of hand-delivering images. Based on the project's success and lessons learned, this pilot may provide a springboard for GHHIE to expand similar services to providers outside the TMC.

The Committee recommended an offering of EHR-lite, enabling providers without EHR capability to view clinical information via GHHIE. Secure clinical messages could also be transmitted through GHHIE.

More broadly, initial service offerings should focus on improving the ability to exchange information that is currently available. GHHIE will begin with specific use cases that meet stakeholders' needs and provide measurable value. The results of these use cases could potentially result in accelerated planning to develop and maintain a repository for specific use cases. While analytics have not been identified as of immediate high value, use cases may drive a change in stakeholders' perception by demonstrating value. GHHIE will consider available academic resources with expertise in healthcare analytics to more quickly create a comprehensive plan for adoption and evaluation of analytics if perceived as a benefit by participants.

Several use cases that can result in "quick wins" for the participants are included in the plan. These cases are based on specific providers with identified needs to share information. By beginning with these use cases, GHHIE can demonstrate its ability to function as a neutral HIE that provides value by delivering solutions to providers' issues.

GHHIE recognizes that patients are not limited to the geographical boundaries of the approved local HIEs; indeed, patients will receive services in "white space" areas. Thus, GHHIE's plan must include the ability to share data across these boundaries

In all cases, GHHIE will ensure that the Office of the National Coordinator for Health Information Technology ("ONC") and the Texas Health Services Authority ("THSA") required services are included.

PLANNED SERVICES

Additional description on these services is provided in the Technology Section.

Category	Service
Core: Base subscription	<ul style="list-style-type: none"> • Clinical Messaging that includes Direct Project Capabilities • Continuity of Care Document (CCD) • e-Prescription/Medication History • Third Party Lab Results Routing • Patient Centric Physician Portal • Patient Portal
Value Added: Menu with cost per service	<ul style="list-style-type: none"> • Radiology Image Sharing • Personal Health Record • EMR lite for Physicians • Eligibility Exchange with Payers • Exchange Infrastructure for Hospitals
Future Functionality: Potentially outside 3-year period for some services	<ul style="list-style-type: none"> • De-identified Laboratory and Immunization data submitted to State • Quality Reporting • Aggregate Data • Disease Surveillance • Workflow Tools

USE CASES AND VALUE

GHIE and its key stakeholders reviewed the Use Cases as outlined in the THSA functional blueprint and determined that the “Transition of Care: Direct Project Provider to HIE” would be the most beneficial to explore and demonstrate value. Several stakeholders that are organizationally ready to participate in a Use Case demonstration have committed time and resources to GHIE to implement and evaluate the value associated with each case.

The first use case was identified by two hospitals that need to share information on frequent Emergency Department (“ED”) users. The two hospitals utilize two different types of EMRs and believe that the Direct Project capability will enhance their ability to avoid unnecessary testing and medication orders. The approach anticipated for deployment is to give each Hospital ED access to secure clinical messaging via the Direct Project Connectivity and to monitor results.

The second use case was identified by Montgomery County and the City of Houston Emergency Medical Services (“EMS”) departments. Again, the Direct Project will be used to determine the effectiveness of electronic communication between the EMS departments and the Hospital ED departments. This case will require the interaction between their EMS EMRs (which are different and not consistent with the hospital ED EMRs). The EMS departments believe that lives can be saved while also saving administrative time in their respective departments.

The third use case involves the potential participation of the three largest Medicaid Provider organizations in GHIE’s service area. The providers believe that the use of secure clinical messaging via the Direct Project will enable them to realize substantial administrative time savings.

GHIE will approach each of these projects by analyzing the current environment, developing workflows, and a detailed project plan. The project plan will have a list of metrics that will be used to evaluate progress as well as value to the stakeholders. The results will be shared with the stakeholder community.

NEED	PARTICIPANTS	TECHNICAL REQUIREMENTS	EXPECTED BENEFIT
Share information on frequent ED users	2 or more proximate Hospital EDs	Clinical messaging; potentially a database	<ul style="list-style-type: none"> • Identify at point of service to eliminate unnecessary testing or medication orders
Communicate information between ED and EMS	County and City Emergency Services and representative EDs	Clinical messaging; access to EMS system for interfaces	<ul style="list-style-type: none"> • Identify available information for EMS for care • Alert ED of care provided • Identify billing and disposition information for EMS
Communicate between Medicaid Plan and hospital	One or more Plans and one or more hospitals	Clinical messaging	<ul style="list-style-type: none"> • Eliminate/ reduce faxing and phone calls • Reduce time for decision making

OUTREACH AND EDUCATION

Engaging multiple stakeholders is key to GHHIE's long-term sustainability and viability. GHHIE has been actively reaching out to all components of the GHHIE service area, encompassing hospital leadership, physicians, payers, employers, patient advocacy groups, pharmacies and laboratories.

PATIENTS

GHHIE established a Community/Patient Advisory Council whose membership includes representatives from a wide range of populations/communities including seniors, the medically underserved, the disabled and their caretaker parents, the mentally ill, the homeless, the Hispanic community, and patient advocates. It also recruited a medical ethicist to participate on the Council. GHHIE solicited input on confidentiality and access concerns and the best methods for outreach and communication. The group's emphasis was on communications, particularly on empowering consumers to demand that all of their providers participate in the GHHIE. Communications opportunities included opportunities such as the GHHIE website, attending Medicaid and HMO enrollment sessions, reaching large employers through their medical plans, offering CEUs, educating medical residents and students in March, and using local television programs. The Council members strongly encouraged placing GHHIE materials in physicians' offices so that all patients have access to education about the benefits of HIE participation for themselves and for all of their providers.

PAYERS

As a result of the provider committee work which took place in the summer of 2011, opportunities to approach the payer community for support were identified. Representatives of the major insurance companies have offered guidance to GHHIE concerning specific services that would be valuable to the payer community. These discussions have been very valuable in identifying strategies for sustainability and are further discussed in the Sustainability section of this plan.

LABORATORIES

GHHIE seeks to involve a diverse base of laboratory providers in the region. Directors of independent laboratories have been invited to participate in the development of similar advisory group. Leadership of major third-party labs, such as LabCorp and Quest, will be contacted to request their participation as well. GHHIE will work with the Texas HIE Coalition and potentially with the THSA to develop a cooperative approach to engaging these labs.

PHARMACIES

GHHIE is identifying leaders in the pharmaceutical field to convene a pharmacy advisory council. GHHIE Board has been instrumental in guiding this process. GHHIE is also working with a pharmacist who is a former independent pharmacy owner as well as conferring with a TMC hospital pharmacist who serves on the State Board of Pharmacy to identify approach effective ways to involve independent pharmacies in electronic exchange.

Letters of invitation to participate in the development of the HIE have been sent to more than half of the retail pharmacy companies. A secondary letter from academic leadership will follow to targeted contacts within professional societies. In addition, ongoing conversations have been held with representatives from the SureScripts organization to identify options to include medication history information.

PHYSICIANS

The Harris County Medical Society (HCMS), the largest county medical society in the U.S. (with a membership of more than 10,000 physicians and medical students), is the professional organization for physicians in Harris County. Its current and former presidents as well as its executive director have provided support and encouragement for GHHIE. Specifically, its support has included:

- HCMS' former president serves on GHHIE's Board of Directors;
- HCMS' current president co-signed a letter of advocacy with GHHIE's CEO, briefly describing HIEs and GHHIE and encouraging area physicians to complete a Statement of Interest
- HCMS' Executive Director attends Board meetings and serves on many of Committees; and
- HCMS has invited GHHIE to participate in its various specialty meetings, CME gatherings and business expo to explain GHHIE's role in HIE development and to solicit statements of interest.

OTHER OUTREACH AND PARTNERSHIPS

GHHIE's outreach and partnerships also include such prominent and notable organizations as the following:

- The Greater Houston Partnership (GHP). This organization traces its roots back to Houston's original Chamber of Commerce founded in 1840. Its principal objective is to build regional economic prosperity. GHP supports public policies that increase access to affordable healthcare, encourage efficiency in the healthcare industry and foster collaboration between and among public and private sector providers. To promote and advocate for improved healthcare efficiencies for the region's business community, GHP offers three (3) healthcare committees: the Healthcare Policy Advisory Committee; the Healthcare Business Development Committee; and the Healthcare Emerging Issues Committee.
- Harris County Healthcare Alliance (HCHA). A coalition whose formation was inspired by the dedicated work of several prior taskforces and in part by the way the Greater Houston healthcare community pulled together after Hurricane Katrina to meet the needs of a sudden influx of underserved residents. That collective experience gave HCHA a vision for a more collaborative approach to meeting the healthcare needs of area residents. Its membership has grown to more than 50 safety net providers and other partner organizations including the GHP.
- Houston-Galveston Area Council (HGAC). It is the region-wide voluntary association of local governments in the 13-county Gulf Coast Planning region of Texas.
- Gulf Coast Regional Extension Center (REC). Its mission is to facilitate safe, effective and meaningful use of state-of-the-art health information technology by all healthcare providers in the region by focusing on primary care practices and their integration with local, state and federal HIE activities with the ultimate goal of improving the health of the citizens they serve.

COMMUNICATION STRATEGIES

In this era of transition between old-school traditional media and emerging digital media, communication must take multiple forms. GHHIE acknowledges that traditional media such as newspapers, radio and television certainly have a significant role in communications. Meanwhile, the internet and social media have created opportunities to reach out through websites, Facebook and Twitter. Finally, there is always the face-to-face personal communications that occur at meetings, seminars, conferences and similar occasions. GHHIE's strong community Board has provided access to groups. Public presentations to small and large groups, both lay and healthcare, have occurred and will continue to take place.

Certain segments of the population are deficient in health literacy and technology literacy and may lack access to computers and other technology. The challenge is to find the right blend of vehicles to reach Greater Houston area residents in a cost-effective and efficient manner.

While the Greater Houston area prizes its racial and ethnic diversity as a source of strength in a global economy, such diversity presents communication challenges. Stephen Klineberg, co-director of the Kinder Institute for Urban Research, has been conducting a far-reaching social survey of area residents for 30 years. The most recent study noted Houston's transformation into the nation's most ethnically diverse major city, citing the area's "greatest fundamental transformation" from a mostly bi-racial city of whites and blacks before the 1980s to the multiethnic city of today, where no group is a majority. According to the most recent figures, whites make up 33 percent of the population, blacks make up 18.4 percent, Hispanics make up 40.8 percent and Asian-Americans and others make up 7.7 percent.

And while the percentage of whites has been growing in the five most populous counties surrounding Harris County, the percentages of other ethnicities has been growing faster. (*Source: HCN Online*) For example, Mark E. Pfeifer, PhD, released a study in 2001 based on an examination of the U.S Census 2000 data. It revealed that the Vietnamese population in Houston grew dramatically from 1990 to 2000, from 32,964 to 63,924. This growth has continued, reaching an estimated population of over 150,000 today, making people of Vietnamese descent the majority Asian population in Harris County.

All of this diversity in age, literacy, ethnicity, etc. contributes to potential communication barriers in language and culture. GHHIE is sensitive to these challenges and will work with the individual communities for outreach and education, particularly through FQHCs and physician champions.

GHHIE has engaged a media communications firm to develop a comprehensive communications strategy focusing on education and outreach. Through a series of interactive sessions with GHHIE Board and staff members, the communications firm synthesized input into a cogent message and brand.

HIE is not a familiar concept in the community and requires standardized and targeted education. Consumers must engage in health information exchange activities if the full value is to be achieved. Similarly, patient involvement in their own treatment is critical to recovery and wellness. To support patient understanding and compliance with physicians' treatment recommendations, patients' access to their own health information must be in an easily accessible electronic format.

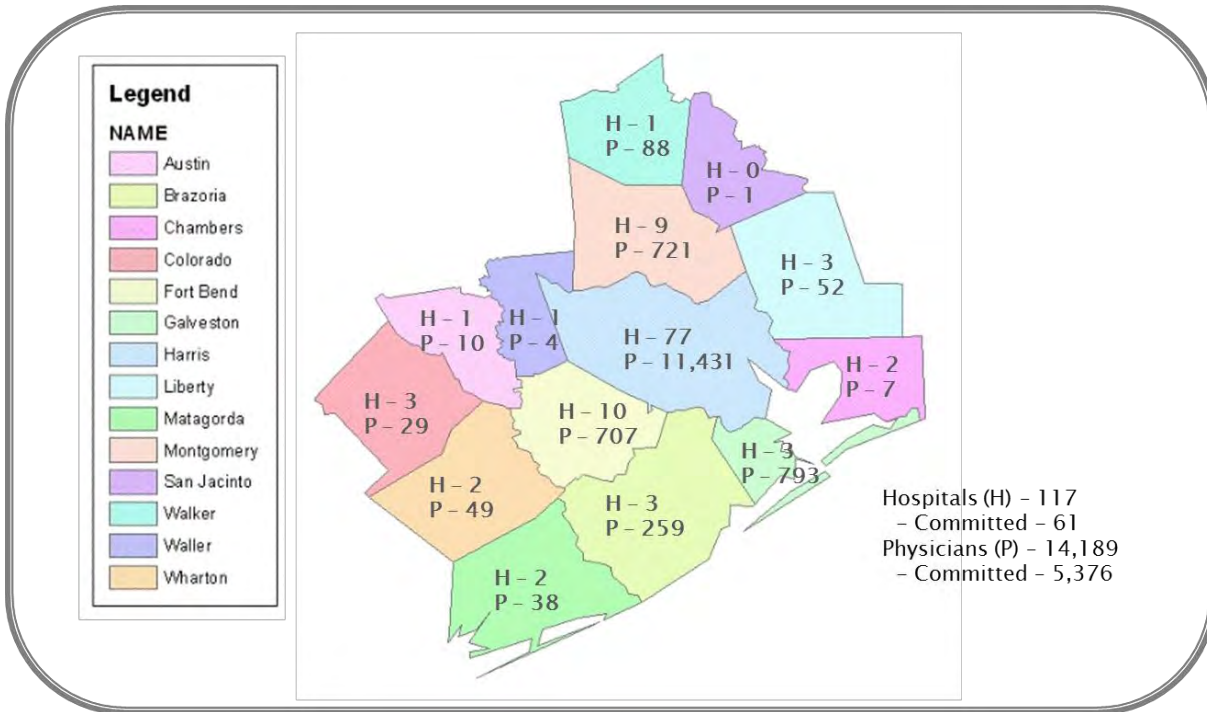
GHHIE is creating a new patient-centric website that provides general information about HIEs and focuses on GHHIE as a valuable community resource. This website will enable GHHIE to communicate important messages, capitalizing on the growing trend toward social media as an important marketing strategy. The website will be continually updated and expanded to meet other provider and stakeholder needs as well. Through the GHHIE website, all stakeholders will be able to log on and access relevant subpages. Participants can also link to affiliate, partnering and sponsoring organizations, as well as general health-related sites. In the future, GHHIE envisions the website as a central means of communication, community education, and patient access.

Stakeholders in the hospital, physician and provider communities have been very active in providing input into the type and form of communications needed. GHHIE's Patient/Consumer Advisory Council identified additional opportunities for outreach and education, including speaking with residents and medical students. Physician-centric materials have been developed and used to educate providers about HIEs and GHHIE's role. The materials have been well-received and GHHIE is developing similar materials for other stakeholder audiences.

SUSTAINABILITY

PROVIDER ENGAGEMENT

Provider engagement is well underway with GHHIE having secured support from 40% of area physicians and over 50% of hospitals which meets or exceeds THSA’s required commitments. The following map illustrates GHHIE’s progress in securing physician and hospital support:



PHYSICIAN ENGAGEMENT

A former member of the staff in the Membership area of the Harris County Medical Society joined GHHIE as a part-time physician coordinator. She has used various databases to send the following by mail:

- GHHIE information;
- Advocacy letter signed by Dr. Reddy, HCMS President and cosigned by GHHIE President; and
- Statement of Interest (“SOI”) with names of physicians and license number so that the Practice can verify or correct.

Someone from GHHIE is invited to speak or hand out literature at the regional meetings and Council meetings. GHHIE also shared a table at the HCMS Expo. Dr. Reddy regularly mentions the HIE in his monthly newsletter.

Almost 5,400 physicians have signed SOIs with GHHIE; that number includes most of the large groups. Because over 50% of the physicians in the target area are in small or solo practice, the engagement strategy is being expanded to include the following:

- HCMS focus
 - Attend the HCMS Specialty Councils to educate the members and request SOIs
 - The President of the International Society suggested that we meet with each Council
 - Continue attending regional meetings
 - Encourage the HIT Committee to introduce us at Medical Staff meetings of their respective hospitals
- Establish a Physician Group in the planned Rural Healthcare Advisory Group
 - Ask for suggestions on how best to communicate with the physicians in their areas
 - Request to speak at the Medical Staff meetings at the hospitals
- Attend the local MGMA meetings to introduce GHHIE and present SOI requests
- Explore opportunities to be a part of CME sessions
- Use faxes as well as emails for small and solo practices
- Update signed physicians with GHHIE progress and request that they tell their colleagues and referrals to contact the HIE
- Identify physicians who may need assistance from the REC or are interested in an EMR lite through GHHIE
- Target physician information on GHHIE website

HOSPITAL ENGAGEMENT

GHHIE added a part-time Provider Manager in July to focus on the smaller hospitals. Each un-signed hospital administrator has received a letter with GHHIE information and SOI followed up with phone calls and a personal visit when scheduled. There appear to be opportunities for early adopters for Core Services based on referral patterns.

The engagement strategy going forward includes the communication approach discussed in the Outreach section as well as the following:

- Look for early adopters with strong referrals to established health systems
- Target hospital information on GHHIE website
- Continue the strategy of emails, letters and phone calls to create an opportunity to meet in person to discuss participation
- Establish the Rural Healthcare Advisory group to create a forum for hospitals who may need assistance with the technology to exchange information

SUSTAINABILITY ASSUMPTIONS

GHIE developed the Sustainability Model based on the following structure. The funding from Core and Value-Add services are conservative estimates which will be finalized when the technology partner contracted and the technical costs are available.

COMPONENT	FOCUS	APPROACH
Funding	Infrastructure	<ul style="list-style-type: none"> Completed an environmental scan with a gap analysis Identified significant disparities in needs Convened stakeholders to provide input and ultimately recommend services Developed an approach that facilitates using/buying what stakeholders need
	Core Services: Base participation cost	<ul style="list-style-type: none"> Developed base with Value-Add menu so that participants have a low entry cost and don't have to pay for functionality planned for the future
	Value Added- Additional cost	<ul style="list-style-type: none"> Identified other sources of funding including building infrastructure for those late to market Identified immediate Payer data needs to replace faxes and phone calls
	Philanthropy/Other Funding	<ul style="list-style-type: none"> Targeted community benefits- that may not have a direct value to participants
Cost	Technology	<ul style="list-style-type: none"> GHIE requirements are similar to most HIEs Leaders in technology should be able to deliver required functionality SaaS to minimize entry costs Pay as you use approach Develop a partnership with vendor including risk and performance metrics Potentially collaborate with other HIEs as a shared service
	Implementation	<ul style="list-style-type: none"> Use a third party paired with employed, seasoned project managers Build in shrinking or expanding based on adoption
	Operations	<ul style="list-style-type: none"> Hire as needed Share administrative roles on an allocated basis with another organization
Performance	Reliability, Service, Privacy	<ul style="list-style-type: none"> Focus on participation agreement so rules of the road are clear Select technology that has delivered in a similar environment and scale and has effective service monitoring reports Provide high quality, responsive staff to liaison with participants
Market Awareness	Communication, Value	<ul style="list-style-type: none"> Need to have electronic, traditional and social media vehicles for communication Develop success stories that demonstrate value Pay attention to the stakeholders Put the patient first

FUNDING ASSUMPTIONS

The funding assumptions are based State funding as seed money for infrastructure. The Local Match significantly exceeds the 25% requirement and is a combination of participant funding at conservative levels based on implementation assumptions and targeted philanthropy.

CATEGORY	ASSUMPTION	RATIONALE
State Grant	Assumes high end commitment numbers	GHHIE will receive remaining \$4.5 million over 9 quarters
Provider participation	Assumes conservative revenue (specific rates TBD after Technology costs are finalized)	Base fee for connectivity and Core services
		Additional fees for Value-Added services
		Early adopters potentially recognized with assistance in implementation
Payer participation	Based on Payer consortium convened by HCMS and TCHP	Payers motivated to assist with information exchange
		Expressed willingness to find a way to support results of information exchange
		Improved work flow opportunities with HIE resonate
		Commitment from early adopters to fund fax/phone replacement activities
Fund development	Assume receives 501 (c) (3)	Targeted philanthropy
		Specific requests may include patient centric portal for physicians, Personal Health Record, connecting underserved populations, corporate sponsors
	Corporate Sponsors	Branding opportunities

BUSINESS PLAN PRO FORMA

FUNDING (000's)	Y1	Y2	Y3	TOTAL
State Grant	\$2,300	\$1,800	\$400	\$4,500
Provider participation	200	825	1,500	2,525
Payer participation	200	1,000	3,500	4,700
Philanthropy and In-Kind	300	500	300	1,100
Total Funding	\$3,000	\$4,125	\$5,700	\$12,825
Total Expenses	\$2,975	\$4,101	\$5,609	\$12,685
Net Cash	\$25	\$24	\$91	\$140

In development of GHHIE’s pro forma, the following assumptions were made regarding Expenses:

PERSONNEL

- Convert contract positions to an employed model with market rates and a PEO arrangement with administrative shared resources with HCHA
- Market rates and fringe at 25%

TECHNOLOGY

- Outsourced for at least a 3-year period
- If possible, will share costs if possible with other HIEs

IMPLEMENTATION

- Third party assistance managed by employed Project Managers

CONSULTING/SERVICES

- Includes legal, marketing, financial, insurance

OTHER

- Rent, travel, supplies, equipment

RISK MITIGATION

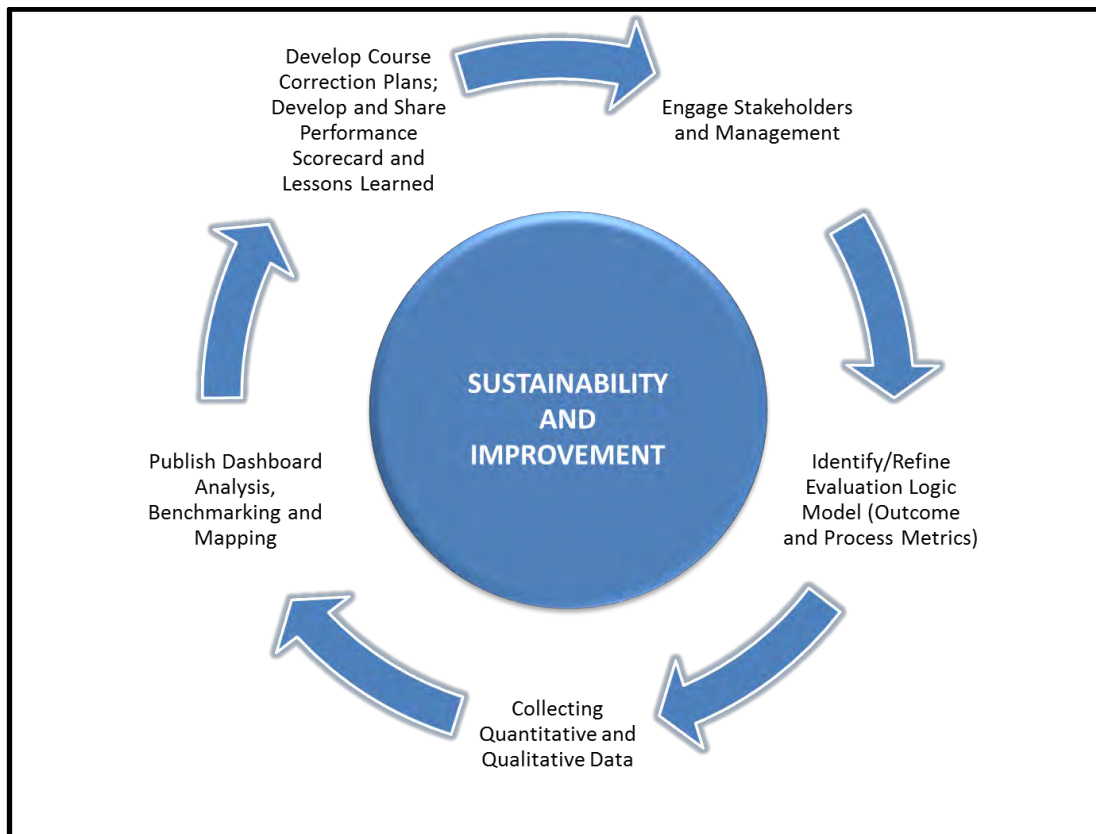
As noted in its most recent quarterly update, GHIE has identified potential risks and developed plans to mitigate such risks. The Sustainability Model detail also included specific risks and mitigation.

CATEGORY	RISK	MITIGATION
Services	By beginning with only Core capabilities, participants may not perceive sufficient value	<ul style="list-style-type: none"> Core capabilities allow proof of concept and demonstrate value from first use cases.
	In researching sustainable HIEs, data aggregation and analysis are the key sources of value	<ul style="list-style-type: none"> The technology platform selected will have the functionality to expand the services offered if the participants recognize the need
	State contract may require additional services	<ul style="list-style-type: none"> Work with the HHSC, THSA, and Texas HIE Coalition to keep informed and participate in developing solutions
Funding	<p>Funding is lower than projected</p> <p>Approval of 501 (c)(3) status is delayed</p>	<ul style="list-style-type: none"> Using the state funding as the source for the build out of the infrastructure before participants are willing to start support allows the HIE to build an operational model to generate revenues and demonstrate value. Estimates for participant revenue and Philanthropy are conservative in the Pro Forma, so there is potential to increase funding components if commitments or participation is lower than projected. Payer funding is based on cost savings for the Medicaid and commercial plans and focused on opportunities for cost savings rather than philanthropy
Cost	Technology costs are greater than budgeted	<ul style="list-style-type: none"> Emphasize Total Cost of Ownership in vendor selection; Build shared risk and performance metrics into the contract; Consult with mature HIEs Collaborate where appropriate
	Difficulty in attracting staff in a competitive market may slow implementation	<ul style="list-style-type: none"> Opportunity to continue with independent contractors or third party staffing Budgeted salaries are competitive
	Adoption may delay implementation or increase demand above projections	<ul style="list-style-type: none"> Build sequencing flexibility into the schedule and implementation resources to facilitate various levels of providers implementations Financials are based on low cost to enter into Core services based on THSA funding Physician and patient requests to exchange information may motivate other providers to participate
	Participants may not have the resources for implementation	<ul style="list-style-type: none"> Partner with consultants who can provide the resources and develop templates to streamline implementation

CATEGORY	RISK	MITIGATION
Performance	Technology does not operate as expected	<ul style="list-style-type: none"> ▪ Build shared risk and performance metrics into the contract and consult with mature HIEs to understand what to expect
	Participants are surprised by requirements for exchanging information	<ul style="list-style-type: none"> ▪ Include potential participants in the development of the participation agreement to include clear “rules of the road” ▪ Staffing includes a Participation Coordinator who will spend the time required to educate them on the agreement
	Service interruptions due to GHHIE technology	<ul style="list-style-type: none"> ▪ Include in the technology contract availability requirements and business continuity requirements so that alternative hosting will be available
	Service interruptions due to community emergency/disaster	<ul style="list-style-type: none"> ▪ Identify what components can be of assistance to support the community
Market Awareness	Difficulty in demonstrating value	<ul style="list-style-type: none"> ▪ Ensure that performance metrics with base lines are identified to enable benefit articulation ▪ Begin with use cases around uninsured and duplication of services
	Privacy and security concerns limit patient acceptance	<ul style="list-style-type: none"> ▪ Communicate with patients and physicians to address concerns through informational material, website, Patient Advisory Council, focus groups ▪ Address potential concerns about Payer involvement by communicating safeguards and compare what is available electronically vs. what was available on paper

QUALITY REPORTING AND PROGRAM EVALUATION

GHHIE will implement a reporting and evaluation plan in the first quarter of 2012 to establish the framework for assessing operational, financial, population-specific, community-based, and patient-focused goals and objectives for the exchange. This evaluation will be based upon a framework designed to continuously improve the sustainability and performance for stakeholders. The evaluation framework will follow a five-step process as indicated in the diagram below.

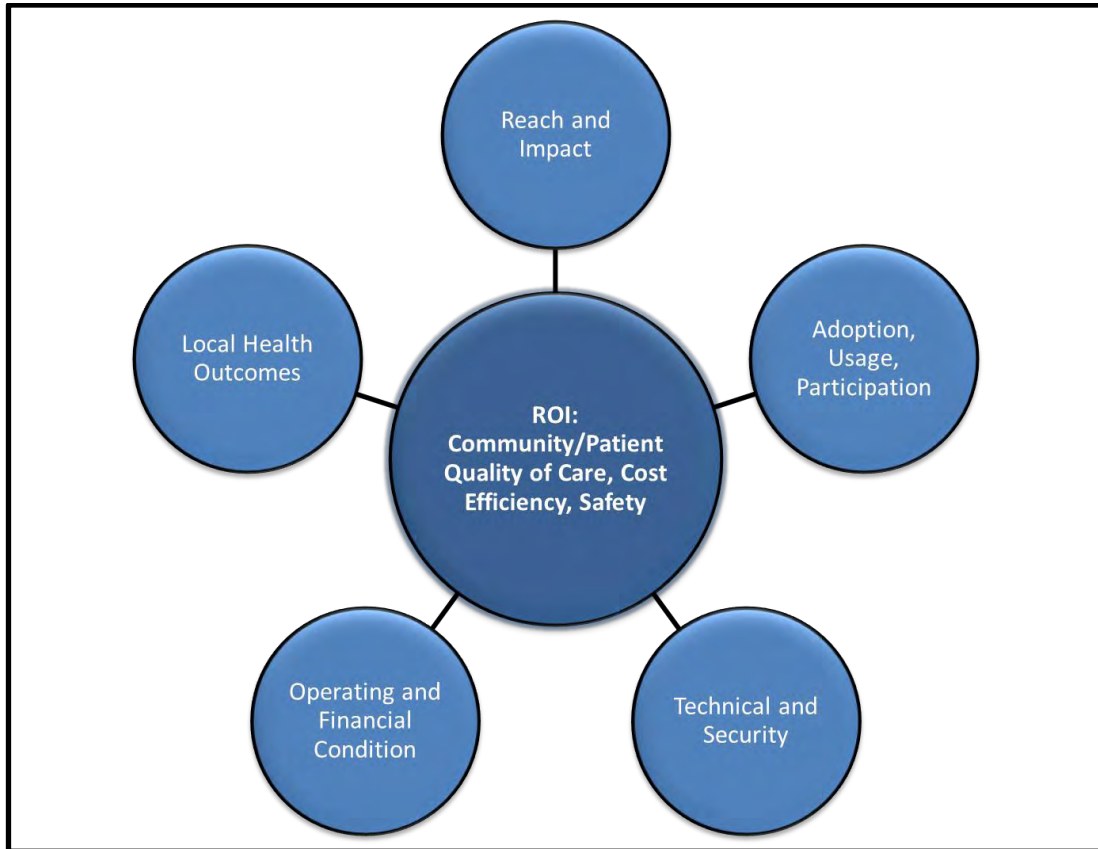


ENGAGE STAKEHOLDERS AND MANAGEMENT

Collaboration is key to making the HIE successful, and stakeholders will be consulted during the evaluation phases. Stakeholders will provide input on the program outcomes, measures, data collection protocols, and contribute to the analysis and interpretation of findings.

IDENTIFY CORE OUTCOME AND PROCESS METRICS (LOGIC MODEL)

At the onset of the exchange implementation, the program will be thoroughly described and include the development of a detailed logic model (including input, process and output, as well as short- and long-term outcomes). This logic model will also measure achievement towards the four (4) primary goals of the exchange (self-sustaining, patient privacy, access, and improvement in efficiency, quality and safety of care). The evaluation design will include both process evaluation, to determine the extent to which the program was implemented as intended, and outcome evaluation, which will be focused on the stated objectives of the program to assess the outputs and impact of the GHHIE. At a minimum, the outcome measures will include those that have been covered in the application, including measurement and documentation of the achievement of many metric categories, as shown below.



Each of these outcome categories will be mapped to specific performance metrics. The following table is the draft metrics for the framework, which will be validated with stakeholders, board, management, and THSA/THHC at the onset of the evaluation.

OUTCOME METRIC CATEGORY	SPECIFIC PERFORMANCE METRICS TO BE CONSIDERED
Financial and Operating conditions	<ul style="list-style-type: none"> • # of patients • # of transactions • \$ revenue generated • \$ of costs avoided • Case study, value creation, and detail of new use cases • Revenue model by core versus value-added services
Adoption, Usage and Participation	<ul style="list-style-type: none"> • # of users • # of hospitals, providers, labs, pharmacies and other constituents connected • # of transactions enabled
Quality and Service Levels	<ul style="list-style-type: none"> • Usability (satisfaction) • Reliability • Downtime (%)
Technical and Security	<ul style="list-style-type: none"> • Trending of system usage • Identification/count of technical risk and threats (breaches and corrective measures) • Degree of interoperability • Transaction process speed

OUTCOME METRIC CATEGORY	SPECIFIC PERFORMANCE METRICS TO BE CONSIDERED
Local Community Health	<ul style="list-style-type: none"> • Measurement of relative value gain (improvement) from special use cases • Enhancements in immunization • Quantifiable public health benefits • Reduction in total administrative costs • Improved coordination of care • Reduction in unnecessary tests

In addition to outcome measures, GHHIE will focus on process evaluation to determine the: (1) actual reach and impact of GHHIE, (2) types of activities (use cases, transactions) utilized, (3) quality of the services, (4) achievement of the broad goals and objectives stated in the Business and Operational Plan, and (5) demonstrated potential towards sustainability. The completed process evaluation will describe both coverage, delivery, and resources (particularly leveraged resources). A few examples of questions to be answered are as follows:

- Which of the key success factors are most widely adopted (collaboration, integration with physician workflow, comprehensiveness of functionality)?
- What types of organizations (providers, insurers, physician groups) are represented and most actively participating?
- What types of transactions and use cases are actually occurring?
- How does the actual use compare to plans?
- What percent of stakeholders (by user group) are satisfied with the services they have been provided?
- How reliable is the service being provided?

COLLECT QUALITATIVE AND QUANTITATIVE DATA

This evaluation will make use of multiple sources of data. Some data will come directly from HIE technical statistics (such as usage, bandwidth, transactions), some will come from the financial reports (revenue, profit, customer market share) and others will come from analyses of community-wide publicly available data. For each metric, GHHIE will derive the data source, the unit of measure, the specific measurement algorithm, and the collection frequency. Service evaluation surveys as well as pre- versus post-comparisons will also be used to address the evaluation questions. Additionally, stakeholders will provide additional feedback. Secondary data sources will be used to evaluate long-term outcomes.

PUBLISH DASHBOARD: ANALYSIS, BENCHMARKING AND MAPPING

A dashboard or scorecard will be created as the HIE is implemented that will periodically updated and circulated to the Board and management to share the key outcomes of the evaluation. The dashboard will be kept simple to show comparisons of performance over time (trending) as well as against established goals and other HIE performance (benchmarking). The dashboard will be maintained at least quarterly (possibly monthly) and provide opportunities for recommendations and revisions based on comparison of actual to planned performance. Monitoring metrics will evolve based on stakeholder inputs and requirements.

DEVELOP RECOMMENDATIONS AND COURSE CORRECTION PLANS

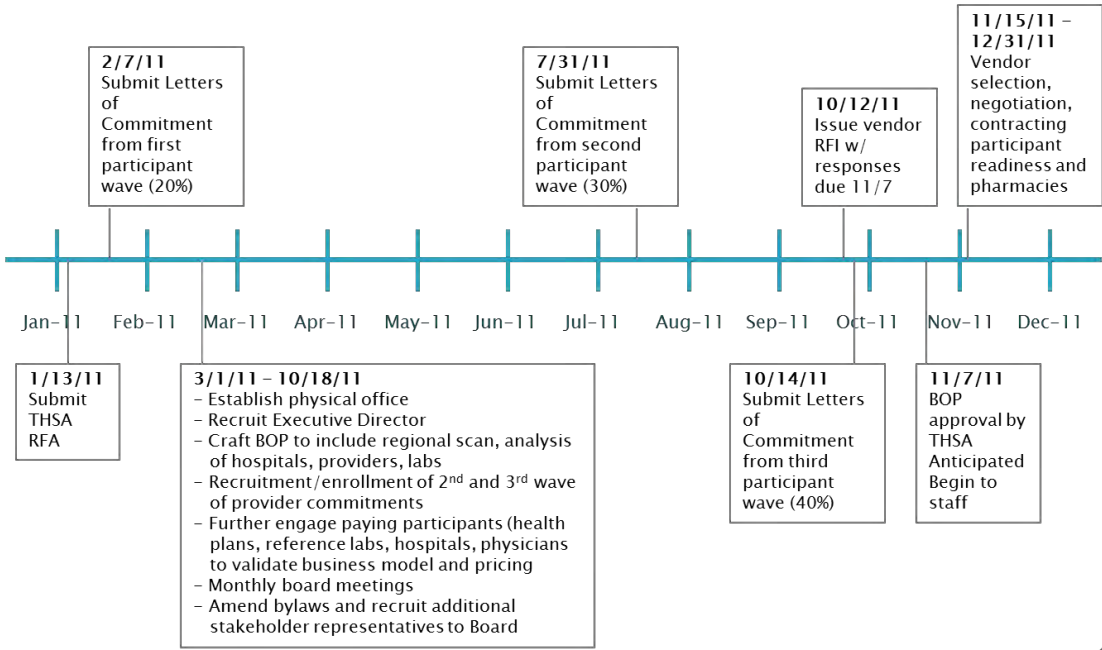
Recommendations for improving performance and continual course corrections will be possible through this feedback loop. After each period’s evaluation, the findings and dashboard will be disseminated to all GHHIE identified stakeholders, management, and board members (as determined in advance with GHHIE management).

A summary of the evaluation model with the exchange’s goals, activities, outcomes, and data methods is outlined in the following table.

GOALS AND OBJECTIVES	TARGET STAKEHOLDER TO BENEFIT	STRATEGIES AND ACTIVITIES	DESIRED OUTCOMES AND INDICATORS OF SUCCESS	DATA SOURCE AND COLLECTION METHODS
Create an integrated, seamless, regional health information exchange accessible to 14 county market	Physicians/ Providers Hospitals/ Systems Payers Employers Patients	<ol style="list-style-type: none"> 1. Develop and design processes for use of the HIE and for access by all parties 2. Develop a forum for collaboration around common IT technology and other matters in Houston 3. Select technology vendor 4. Conduct stakeholder survey of satisfaction and needs 	<p><u>Outcome:</u> Improvement in the efficiency, quality and safety of care through rapid secure access to patient clinical data</p> <p><u>Metric Category:</u> (see Figure 2): Adoption, Quality, Financial</p>	Surveys Actual system/exchange transaction records Financial reports Community-level data
Provide patient-level access to improve active ownership of their individual health information	Patients, Payers	<ol style="list-style-type: none"> 1. Deploy technology (such as Patient Portal/ PHR) for access by patients to review recent orders/services performed, which could reduce duplicate tests/services (and reduce unpaid claims) 2. Encourage, through marketing and consumer awareness, the use of this system in the community 3. Document and analyze the changes in usage over time 	<p><u>Outcome:</u> Wider access to health records by patients</p> <p><u>Metric Category:</u> Adoption, Local Community Health</p>	Surveys Exchange transactional reports
Protect patient privacy through secure risk-mitigated deployment	Patients, Providers, Employers, Payers	<ol style="list-style-type: none"> 1. Develop a risk mitigation plan for operational risks, technical risks, community risk, and financial risks. 2. Monitor risks routinely 3. Develop business continuity plans 4. Develop continuous quality and risk management plans 	<p><u>Outcome:</u> Develop and deploy optimal security and privacy practices</p> <p><u>Metric Category:</u> Technical and security; Quality and service</p>	System-generated breach and security reports Surveys Risk Assessments
Create a financially self-sustaining business model	All	<ol style="list-style-type: none"> 1. Perform cost savings analyses 2. Estimate return on investments, for stakeholders and the exchange, routinely 3. Develop and refine special use cases and value generation from each use case 4. Routinely survey user group to identify and implement new use cases and service lines for potential revenue enhancements 	<p><u>Outcome:</u> Long-term sustainability of the exchange and strategic adaptation to new opportunities</p> <p><u>Metric Category:</u> Financial and Operating Metrics</p>	Financial reports Surveys Economic (cost-revenue) Assessments

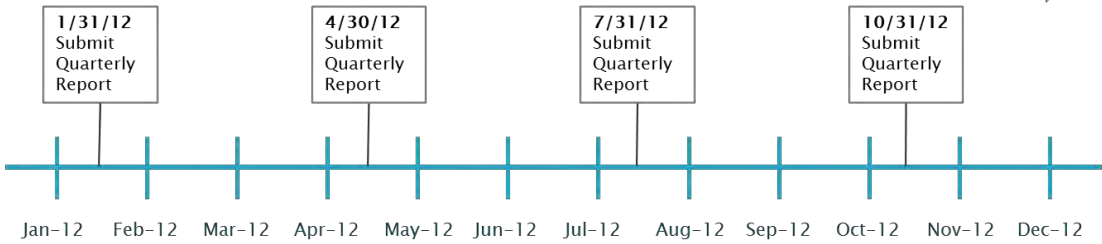
TIMELINE

2011 Timeline of Activities



2012 Timeline of Activities

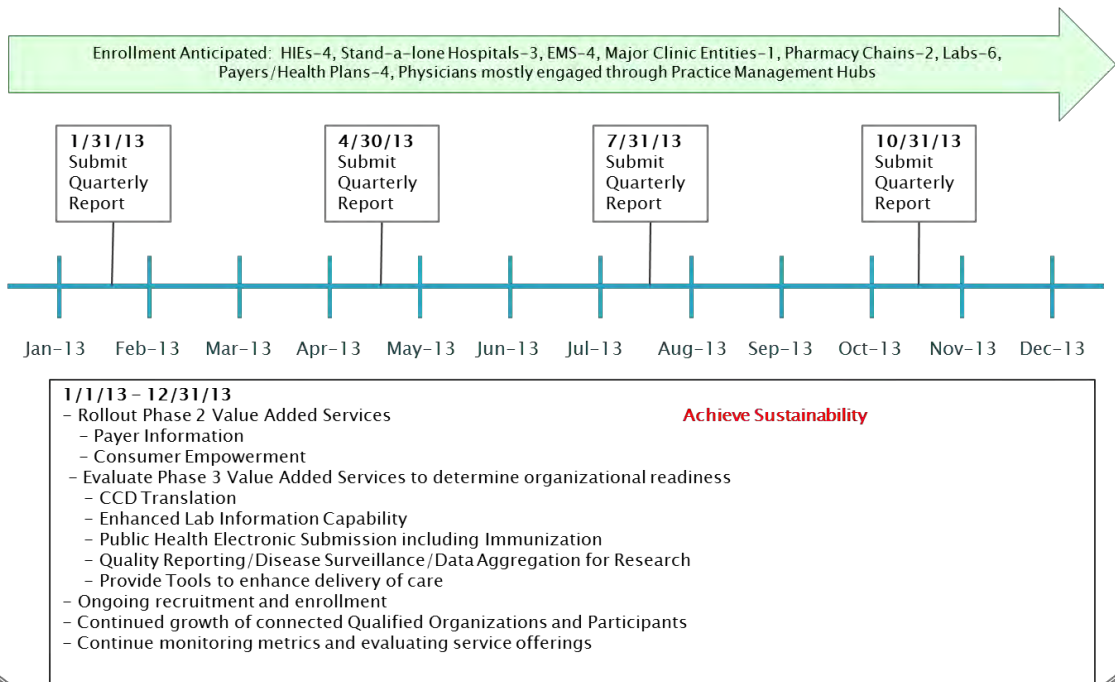
Enrollment Anticipated: HIEs-4, Stand-a-lone Hospitals-3, EMS-2, Major Clinic Entities-2, Pharmacy Chains-2, Labs-4, Payers/Health Plans-4, Physicians mostly engaged through QOs



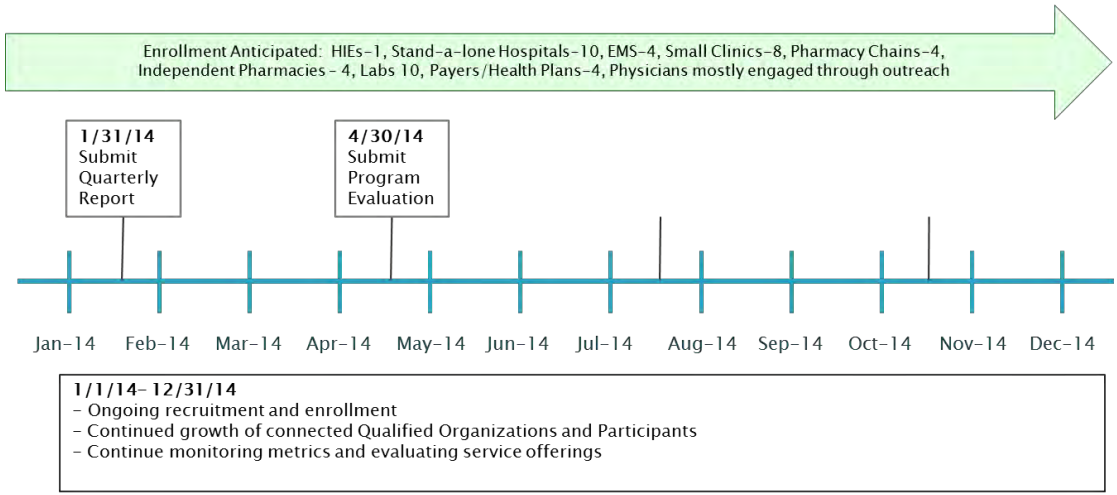
- 1/1/12 – 6/30/12**
- Provide Direct Project connectivity
 - Enroll key organizations
 - Deploy technology partner solution with Core Services
 - Demonstrate first 3 use cases
 - Ongoing provider recruitment
 - Begin dialog with "not ready" pharmacies and labs to promote upgrades and readiness in later wave
 - Continue monitoring metrics and evaluating service offerings

- 7/1/12 – 12/31/12**
- Begin rollout of Phase 1 Value-Added Services
 - Radiology/Imaging Information
 - Medication History
 - EHR-lite
 - Continue to enroll key organizations and recruit providers
 - Continue to connect hospitals, clinics, labs, pharmacies and payers
 - Possible seeding of CDR via similar storage (with or without data extraction) of pass-through messages
 - Start recruiting imaging centers
 - Continue monitoring metrics and evaluating service offerings

2013 Timeline of Activities



2014 Timeline of Activities



APPENDIX B

MARKETING MATERIALS

Benefits of Participation in THE GREATER HOUSTON HEALTH INFORMATION EXCHANGE

PHYSICIAN PRACTICE ADVANTAGES

- Easier access to records for a more complete view of a patient's history
- Electronic transfer of information, eliminating the need for faxes
- Improved coordination of patient care among different providers
- Availability of critical patient information during a disaster or emergency
- Streamlined referral process and feedback
- Privacy and security for your patients
- Enhanced compliance in providing Continuity of Care Documents (CCD)



JOIN OTHER HEALTHCARE LEADERS

OVER 5000 PARTICIPATING PHYSICIANS

- Baylor College of Medicine and Baylor Clinic
- CHRISTUS Provider Network
- Greater Houston Anesthesiology, PA
- Houston Eye Associates
- Kelsey-Seybold Medical Group PLC
- Mental Health Mental Retardation Authority
- The Methodist Hospital Physician Organization
- OBGYN Associates
- Texas Children's Physician Services

MAJOR PARTICIPATING HOSPITAL SYSTEMS

- CHRISTUS Health
- Harris County Hospital District
- HCA
- Kindred Hospital-Houston
- Memorial Hermann Health System
- The Methodist Hospital System
- Oak Bend Medical Center
- St. Luke's Episcopal Health System
- Tenet Health System
- Texas Children's Hospital
- UT MD Anderson Cancer Center
- UT Medical Branch at Galveston

NEXT STEPS

- Participate in shaping this exciting development in our region by completing a statement of interest.
- Continue to communicate your needs and ideas for a healthier community in the Greater Houston area.

1310 Prairie, Suite 1080, Houston, Texas 77002 • (713) 368-3285 • www.GHIE.org

FREQUENTLY ASKED QUESTIONS (FAQS) – PHYSICIANS



1. How will GHIE help me meet Meaningful Use Requirements?

GHIE plays a collaborative role among health care providers, facilitating the exchange of electronic health records by providing a portal for the transfer of standardized patient records that meet CCD requirements.

2. Does participation in GHIE prevent me from connecting with my own hospital's information exchange?

No. The GHIE recognizes the innovative and forward-looking work of many hospital systems in designing their own enterprise HIEs. GHIE will simply convene all of those organizations to enable seamless, region-wide information exchange for all physicians and their patients.

3. What if I admit to several hospitals?

That's the beauty of electronic information exchange! Wherever you practice, you'll be able to access your patients' health records in a timely and secure manner.

4. What is the cost of joining?

The statement of interest is non-binding and does not obligate you to share information when the system comes online in 2012. During the implementation phase, providers will begin participating according to their own pace and system capabilities. Varying business models are currently under consideration.

5. What if I don't have an electronic medical record?

GHIE can still help you to begin meeting Meaningful Use Requirements by sending and receiving your patient records as PDF files.

6. What if I am a hospital-based physician?

You can still play a valuable role by joining and helping to shape the HIE. Your unique hospital perspective will help us create a more complete system of exchange.

7. How are healthcare providers impacted?

- Ability to work together using the same information, available anytime and anywhere, for improved outcomes and a better patient experience
- Improved patient safety through the reduced likelihood of dangerous drug and allergy interactions
- Better workflow efficiency and lower administrative costs
- Enhanced communication between hospitals, laboratories, pharmacies and physician offices resulting in the avoidance of duplicate testing and unnecessary procedures



ADDITIONAL INFORMATION IS AVAILABLE AT WWW.GHIE.ORG.

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APPENDIX C



GREATER HOUSTON HEALTH INFORMATION EXCHANGE
A collaboration to enable regional health information exchange
1310 Prairie Street, Suite 1080 – Houston, TX 77002

Dear Managing Partner:

As you may know, in order to qualify for the maximum “meaningful use” incentive dollars your practice must be able to electronically exchange data. For this to happen, we must first create a Health Information Exchange (HIE).

The Harris County Medical Society (HCMS) Board supports and is working with the Greater Houston Health Information Exchange (GHHIE) to build such a system. GHHIE is a start-up organization that shares HCMS’ goals for HIE. Most major hospital systems and the largest physician practices are initial participants with GHHIE. There are currently 3,781 physicians participating. GHHIE must have 5,374 physician participants by July 29, 2011 and 8,061 by October 18 to maximize funding.

HCMS and GHHIE believe it is far better to develop a HIE locally that fits the unique needs of Harris County physicians. If we do not develop our own, then the government will dictate HIE to us. We need a secure, efficient, low cost way to share medical information between those who need it. It must be seamless, secure, immediate, private, and cost effective.

Development grants are now available. Funding is allocated based upon the number of committed physicians and hospitals who support (intend to use) the local HIE. We want to include every single physician in our area. That will increase the dollars available to Harris County, and greatly increase our chance of success. **We need your help now.**

Your HCMS Health Information Technology Committee, Past President Dr. Bill Gilmer, Executive Vice President Mr. Greg Bernica, and many others are actively participating and committed to the development of this project (GHHIE). Enclosed is an overview about the organization and tentative plans.

A signed commitment now is not a contractual commitment, but instead indicates only that your group will use GHHIE to exchange data, if it lives up to expectations. There is no cost at this time. Once GHHIE has a product developed and a realistic pricing mechanism, you will have an opportunity to formally contract or not.

To participate, sign the enclosed form, including a list of each physician’s name and medical license number in your practice. Mail back to: GHHIE, 1310 Prairie St., Suite 1080, Houston, TX 77002 or fax to 832.900.3958.

For questions and/or additional information please contact Kay Carr at 281.460.6421 or kay.carr@ghhie.org or Greg Bernica at 713.524.4267 or greg.bernica@hcms.org.

Sincerely,

A handwritten signature in black ink that reads "Guru N. Reddy".

Guru N. Reddy, MD
President
Harris County Medical Society

A handwritten signature in black ink that reads "Kay Carr".

Kay Carr
Chief Executive Officer
Greater Houston Health Information Exchange