

# **The On-Track System (TOTS)**

**Early Childhood Data  
Systems in Texas**

**Recommendations  
to Governor Rick Perry**

**October 2012**



**T E X A S**  
**EARLY LEARNING**  
**C O U N C I L**



The Texas Early Learning Council is an 18-member, governor-appointed advisory council on early childhood education and care. In 2010, the Council began an ambitious three-year federal grant to improve school readiness in Texas.

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# TOTS Recommendations

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# Texas Early Learning Council Members

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# Letter from the Chair

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Dear Governor Perry and fellow Texans,

To see the future of early childhood in the United States, one only has to look toward Texas. We lead the nation in size, growth, and the diversity of our early childhood population. We serve our young children through a variety of state programs – public school prekindergarten, Children’s Health Insurance Program, Early Childhood Intervention, *Texas School Ready! Project*, child care subsidies, and the Preschool Program for Children with Disabilities, just to name a few. For every program offered to Texas families and to young children, the State directs significant resources towards collecting, storing, and using data related to these services. Few, however, have asked the question, *how can we use these data sets to make better decisions and create better outcomes for children?*

Nationally, there is a growing trend towards using data in smarter, more efficient ways to yield improved outcomes for children, and the Texas Early Learning Council seeks to encourage the State of Texas to participate in that trend. Our Council’s research into early childhood data systems in the state details a robust but fragmented collection of data sets among several important state agencies. Great data is collected, information that could certainly support informed decision-making; however, there are current challenges with respect to data governance, finance, and data sharing that effectively prevent our state from maximizing the potential of its early childhood data.

Under the leadership of former Council Chair Dr. John Gasko, the Texas Early Learning Council spent a little over one year investigating the feasibility of building an integrated early childhood data system for our state. As we moved forward in the investigation, important questions came to the surface, which the Council was not positioned to answer properly. Agency stakeholders asked *who is going to staff this project? How can we be assured that we will be compliant with federal data requirements? Who will host the project? How often will it be updated?* Lacking the authority to answer these questions sufficiently, the Council decided to shift the project to a process of developing recommendations for the state. We hope our recommendations will guide you and other decision makers in consideration of early childhood data systems. I know I speak for all members of the Texas Early Learning Council in saying, it has been a great honor to work on building Texas’s capacity in this critical area. Thank you for the opportunity to serve the families of Texas in this unique way.

Sincerely,  
LaShonda Y. Brown  
Chair, Texas Early Learning Council

# Table of Abbreviations

Abbreviation	Measure/Collection System	Description
<b>DARS</b>		<b>Texas Department of Assistive and Rehabilitative Services</b>
	TKIDS	Texas Kids Intervention Data System
<b>DSHS</b>		<b>Texas Department of State Health Services</b>
	LIMS	Lab Information Management System
	TEHDI	Texas Early Hearing Detection and Intervention
<b>DFPS</b>		<b>Texas Department of Family and Protective Services</b>
	CLASS	Child Care Licensing System
	IMPACT	Information Management Protecting Adults and Children in Texas
<b>HHSC</b>		<b>Texas Health and Human Services Commission</b>
<b>TWC</b>		<b>Texas Workforce Commission</b>
	TWIST	Texas Workforce Information System of Texas
<b>TEA</b>		<b>Texas Education Agency</b>
	TSDS	Texas Student Data System
	PEIMS	Certified Public Education Information Management System
	TPEIR	Texas P-20 Public Education Information Resource
	DCD	District Connections Database
	SIS	Student Information System
<b>HS</b>		<b>Head Start</b>
	PIR	Program Information Report
<b>UTHealth</b>		<b>University of Texas Health Science Center at Houston</b>
	TOMS	Texas School Ready! Online Monitoring System
	SRC	School Readiness Certification System
	PM	Progress Monitoring
	ECWR	Early Childhood Workforce Registry

# Executive Summary

## The On-Track System

Appointed by Governor Perry to improve school readiness in Texas, the Texas Early Learning Council embarked on a three-year grant in 2010. One of the Council's primary initiatives is known as The On-Track System (TOTS), a project to study early childhood data systems integration, and to then design and implement such a system in Texas. Because of critical feasibility concerns uncovered in the feasibility study, the Council has halted development of TOTS, opting to provide recommendations for its future development.

These recommendations are organized into two categories: Data Recommendations and Governance Recommendations. The recommendations were developed by the Texas Early Learning Council through extensive research and stakeholder feedback.

## TOTS Recommendations

### Data Recommendations

The Data Recommendations relate to the technological feasibility of creating TOTS, or any early childhood data exchange system in Texas. The recommendations outline requirements in technology, data standards, and security and confidentiality to maintain an early childhood data system. Read more about the Council's Data Recommendations beginning on page 13.

#### **Data Recommendation #1: Data Warehouse**

**Build an integrated data warehouse.**

#### **Data Recommendation #2: Hosting at an Existing State Agency**

**House TOTS at a publicly-owned institution, designated by the Texas Legislature.**

#### **Data Recommendation #3: Third Party Application Development**

**Contract with a vendor using a work-for-hire contract to create the TOTS application in order to avoid on-going licensing fees often associated with application service provider agreements.**

#### **Data Recommendation #4: Use of Pre-Existing Software Tools**

Use pre-existing software for data integration and analytics for TOTS, particularly extraction, transform, and load (ETL) and business intelligence (BI).

#### **Data Recommendation #5: Data Sharing**

Create and fund a Texas early education data governance structure to provide a framework for interagency data sharing.

#### **Data Recommendation #6: Program Identifiers**

Use TOTS to assist in defining and identifying programs throughout the state.

#### **Data Recommendation #7: Data Matching**

Use a Master Data Management (MDM) hub as a specific technology for identifying and matching child-level data to create a gold standard of identification across data sources.

#### **Data Recommendation #8: Unique Child Identifiers**

Establish a unique early education identifier for each child to facilitate linkage between early childhood services and longitudinal outcome measures.

#### **Data Recommendation #9: Security Principles**

Apply the “Highest Common Denominator” security principle in any future design of TOTS.

### **Governance Recommendations**

The Governance Recommendations outline the necessary steps to establish a governance structure for TOTS. This section outlines specific recommendations for the purpose, scope, authority, and sustainability of a data governance structure for Texas early childhood data. Read more about the Council’s Governance Recommendations beginning on page 21.

#### **Governance Recommendation #1: Usability for Stakeholders**

A data governance entity should provide the decision making and guidance to ensure that relevant consumers have access to data to make empirical decisions.

#### **Governance Recommendation #2: Data Sharing**

A data governance entity should provide guidance, rules, and a policy framework for facilitating sharing between agencies.



### **Governance Recommendation #3: Identify Information Gaps**

A data governance entity should identify gaps in data and report back to agencies to influence future data gathering initiatives.

### **Governance Recommendation #4: Provide Infrastructure Support**

A data governance entity should fund staff salaries and technological improvements that support all relevant agencies in participating fully in TOTS.

### **Governance Recommendation #5: Local Data Integration**

A data governance entity should further identify smaller data sources to include in TOTS. The entity should also plan to support the integration of these systems into TOTS.

### **Governance Recommendation #6: Implementation**

A data governance entity should link the strategic vision with the operational realities of implementing an innovative system and provide the framework for this integration.

### **Governance Recommendation #7: Administration Guidance**

A data governance entity should provide for rulings and guidance on administrative components of TOTS.

### **Governance Recommendation #8: Data Management**

A data governance entity should provide written guidelines and standards for the management of the data in TOTS.

### **Governance Recommendation #9: Authority**

The Texas Legislature should designate a TOTS host agency, along with a mandated interagency advisory board, to guide the work and decisions associated with the creation and maintenance of TOTS.

### **Governance Recommendation #10: Decision-Making Authority**

The Texas Legislature should entrust the ultimate authority to make TOTS decisions and enact TOTS policies with one state agency.

### **Governance Recommendation #11: Advisory Board Representation**

The Texas Legislature should mandate all relevant institutions to send representatives to comprise an ongoing advisory board that will serve to shape decisions and data governance rules relevant to the construction and ongoing maintenance and supervision of TOTS.

## Governance Recommendation #12: Interagency Agreements

The Texas Legislature should mandate the designated agency to coordinate agreements between all relevant agencies; relevant agencies should be mandated to participate in the creation of these agreements.

## Governance Recommendation #13: Establishment and Maintenance

The Texas Legislature should provide authority to the designated state agency, as well as the appropriate funding, to create and maintain the TOTS governing entity.

## TOTS Implementation Costs

The estimated four-year cost for the implementation of TOTS is **\$6,555,000**. The following is an estimated breakdown of costs:

Year 1:	\$777,500
Year 2:	\$1,977,500
Year 3:	\$3,087,500
Year 4:	\$762,500
Total:	<b>\$6,555,000</b>

This budget reflects several constraints. These estimates reflect budgeted figures. Actual amounts vary between 25% of budgeted amounts. On-going maintenance costs after year 4 would amount to 20-30% of the start-up costs. These costs reflect the direct costs and approximate fringe rates of the hosting agency but do not account for costs borne by the participating agencies. Participating agency costs would include expenses for legal, program, and IT support.

To learn more about the Texas Early Learning Council and TOTS, and to read the TOTS Strategic Plan, visit our website, [www.earlylearningtexas.org](http://www.earlylearningtexas.org).

# Introduction

A key priority of the Texas Early Learning Council is to develop recommendations regarding the establishment of a unified data collection system for public early childhood education and development programs and services throughout the State, as indicated in the *Improving Head Start for School Readiness Act of 2007*. However, the Council had set its own, more ambitious, goal related to data collection - The On Track System (TOTS).

The Texas Early Learning Council is a 18-member advisory council established by Governor Rick Perry in late 2009. The Council aims to improve school readiness in Texas through targeted strategies stemming from the Council's four priority areas:

**Parental Outreach and Communications**  
**Early Childhood Workforce and Professional Development**  
**Collaborations and Standards**  
**Data Systems and Quality Rating and Improvement Systems**

Over the course of three years, the Council will spend \$11.4 million in *American Recovery and Reinvestment Act* (ARRA) funds to improve key aspects of early care and education in Texas. Impetus and rules for the Texas Early Learning Council and other similar entities throughout the country were mandated in the *Improving Head Start for School Readiness Act of 2007*, which required the Governor of each State to designate or establish a council to serve as the State Advisory Council on Early Childhood Education and Care (referred to simply as State Advisory Councils). Naturally, the Council's work related to unified data systems falls under the Data Systems and Quality Rating and Improvement Systems priority area.

All work on the Council's data systems project was overseen by the Data and Quality Rating and Improvement Systems (QRIS) Subcommittee:

**John A. Whitcamp**, Subcommittee Chair, *Child Care Associates*

**Mary Capello**, *Teaching and Mentoring Communities*

**Elsa Cárdenas-Hagan**, Ed.D. *University of Houston*

**Gina S. Day**, *Texas Education Agency*

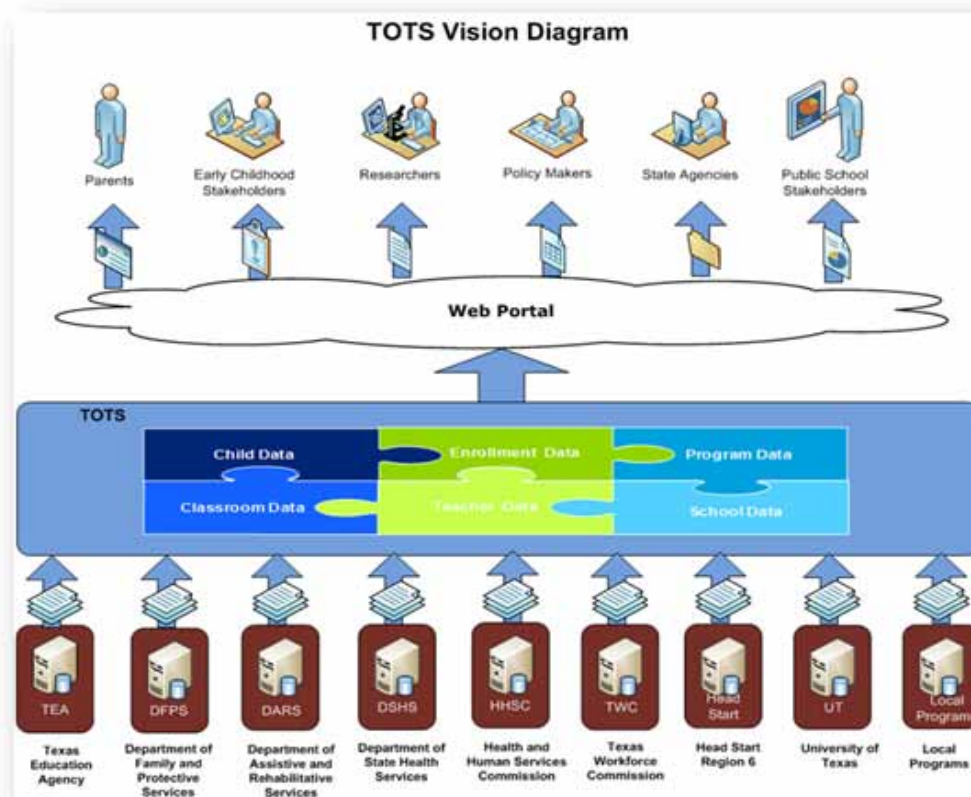
**John W. Gasko, Ph.D**, *Children's Learning Institute*

**Reagan Miller**, *Texas Workforce Commission*

The vision of TOTS is to serve as a robust early childhood information exchange system in order to increase the efficacy of early childhood programs through data usage, planning, and ongoing improvement. Ideally, TOTS would cut through long-established

silos in Texas government, increasing cooperation and collaboration among agencies and policymakers so that young children and families receive the highest quality, most effective programs and interventions possible. It was the hope of the Council that, when complete, the system would bring together the varied data collection systems and house pertinent early childhood data in one accessible and usable location. From this system, parents, school districts, researchers, and policymakers would have a much clearer picture of the early childhood education system in Texas, particularly of the programs and services impacting our youngest Texans, and they would be better equipped to determine whether children are on-track to succeed.

The diagram below reflects the blueprint for TOTS. The lowest tier of the graphic, represents the current siloed nature of state’s early childhood data systems; TOTS would integrate these systems into a data warehouse which is reflected in the second tier, labeled “TOTS.” The data warehouse coupled with an web portal would serve as an access point for various types of stakeholders to access integrated early childhood data to make informed decisions.



The need for such a system is evident in multiple ways in Texas. First, Texas is a rapidly growing state. In 2010, Texas had a population of more than 25.7 million, nearly 9% of the total U.S. population. Much of this rapid growth is driven by sharp increases

in our child population. Currently, 27% of the Texas population is under the age of 18, and our state has more than 2.3 million children under the age of 5. With so many young children, and given that this population trend is expected to continue, Texas must work to utilize our resources in the most effective and efficient ways possible to support the healthy development and education of our young children. Currently, the state serves young children and families through a number of diverse systems spread across a variety of federal, state, and local agencies, as well as community organizations and for-profit entities. In effect, early care and education is delivered through a patchwork of services. To the extent that these systems remained siloed, difficulties regarding inefficiency, redundancy, quality of care, coordination and continuance of care, and gaps in service will continue. The work conducted by the Council on TOTS found that significant data is collected throughout the state; however, it is rarely used in conjunction with other data sets to maximize the impact of interventions and programs. This lack of coordination constitutes a significant area for improvement.

The Council pursued the following steps to develop TOTS. After securing the ARRA funds, the Council strategically prioritized its initiatives. The Subcommittee decomposed the project into two phases: a planning phase and an implementation phase. Because of the scope and technical nature of TOTS, UTHealth issued a Request for Proposals (RFP) for a consultant to assist with the development of a strategic plan, joint requirements planning (JRP), and joint application development (JAD). The Council collaborated with the consultant to produce the strategic plan which was based on several activities: case studies of states pursuing similar data integration initiatives, a survey of early childhood data of state agencies, a broad stakeholder's meeting, and recommendations for best technology and business practices. After the publication of the strategic plan, the Council worked with the consultant to develop business requirements which would outline what TOTS should deliver to stakeholders. Through weekly stakeholder meetings, these requirements successfully described what the system should provide to stakeholders.

Despite the best efforts of the Council and our partners, TOTS was halted due to significant systemic issues in the state that the Council was not positioned to address or remedy. Initially, the Council intended to develop TOTS into a fully functional early childhood information exchange system that would tie into the state's kindergarten to college and workforce data system, which is currently being revamped into the innovative Texas Student Data System. Unfortunately, critical feasibility issues prevented the development and implementation of the system.

The feasibility concerns included:

- Lack of interagency data governance standards**
- Lack of interagency agreements for sharing data**
- Long-term sustainability concerns**

Due to these issues, the Council decided to halt the actual development and build of TOTS. Instead, the Council has documented its experience investigating and exploring the creation of TOTS. From this experience, the Council gained key knowledge that can support the state in moving forward with TOTS. The Council has included this knowledge in the following document along with precise recommendations that if followed can lead to a robust integrated early childhood data exchange system for Texas. This document serves as a resource to Governor Perry, the Texas Legislature, and all stakeholders interested in the development of data driven decision-making models for early care and education in the State.

The Council is extremely grateful to all of the stakeholders and community members that worked with us on TOTS. Their time and effort was invaluable to this project.

**Mary Gwyn Allen**, Texas Department of State Health Services  
**Karl Bernard**, UTHealth  
**LaShonda Y. Brown**, Texas Head Start State Collaboration Office  
**Sue Carpenter**, United Way Capital Area  
**April Crawford, Ph.D.**, Children's Learning Institute  
**Katie Chennisi**, Children's Learning Institute  
**Lynnette Davis**, Texas Department of Family and Protective Services  
**Regan Dobbs**, Texas Workforce Commission  
**Kevin Granhold**, UTHealth  
**Chris Guerrero**, Texas Department of State Health Services  
**Virginia Hancock**, Texas Department of Family and Protective Services  
**Brian Herod**, Children's Learning Institute  
**Elizabeth Hoffman**, Office of Head Start  
**Ron Hubbard**, City of Austin  
**Jonel Huggins**, Texas Education Agency  
**Ursula Johnson, Ph.D.**, Children's Learning Institute  
**Kathy Krammer, Ph.D.**, Texas Health and Human Services Commission  
**Margie Larsen**, Booz Allen Hamilton  
**Montgomery Meitler**, Texas Education Agency  
**Robin Nelson**, Texas Department of Assistive and Rehabilitative Services  
**Jacquie Porter**, Austin Independent School District  
**Brian Rawson**, Texas Education Agency  
**Mary Riggs**, Texas Health and Human Services Commission  
**Bill Sun**, UTHealth  
**Phil Warner**, Texas Workforce Commission  
**Jeff Williams, Ph.D.**, Children's Learning Institute  
**Stephanie Jones-Wood**, Children's Learning Institute

# TOTS Recommendations

The Texas Early Learning Council's Recommendations for TOTS are organized into two categories: Data Recommendations and Governance Recommendations

The Data Recommendations relate to the technological feasibility of creating TOTS, or any early childhood data exchange system in Texas. The recommendations outline requirements in technology, data standards, and security and confidentiality to maintain an early childhood data system.

The Governance Recommendations outline the necessary steps to establish a governance structure for TOTS. These include specific recommendations for the purpose, scope, authority, and sustainability of a data governance structure for Texas early childhood data.

## Data Recommendations

The following section details the data recommendations generated through the creation of the TOTS strategic plan and the Joint Requirements Planning (JRP) sessions. The following recommendations relate to the technological feasibility of creating an early childhood data exchange system in Texas.

### Technology

#### Data Warehouse

In establishing a portal to deliver integrated data to stakeholders, one of the first steps is to determine the appropriate architecture upon which to build the system. Just as an office building needs an architectural design before beginning construction, an integrated data system needs a conceptual plan through which an implementation team can move forward.

*Data Recommendation #1:*

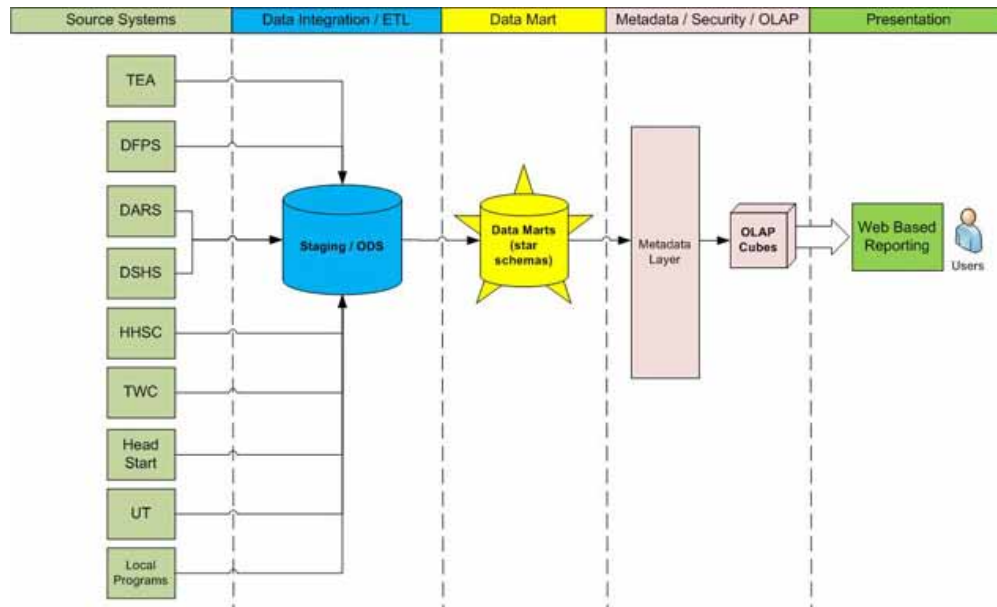
**Build an integrated data warehouse.**

The strategic plan outlined three possible data models for use in creating TOTS. The options included a data warehouse, a federated system, and a master data management hub. The strategic plan outlines the advantages and disadvantages of each model. The diagrams on the following pages illustrate the three models.



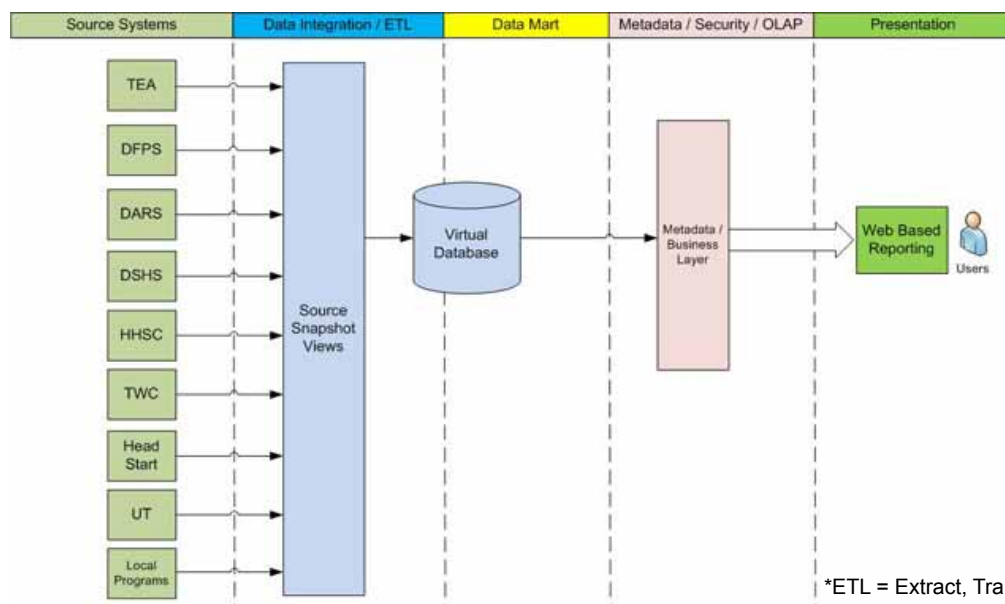
## Integrated Data Warehouse Model

The Integrated Data Warehouse model draws data into a single repository and by using Online Analytical Processing (OLAP), it provides users with data that they require via a web portal. The following diagram illustrates the integrated data warehouse model.



## Federated Model

The federated model provides a method for drawing data from various home sources. It then provides the user with access to data stored in its original location. It would provide a one-stop shop for accessing the data that remains in residence at the hosting agencies. The following diagram illustrates the federated model.

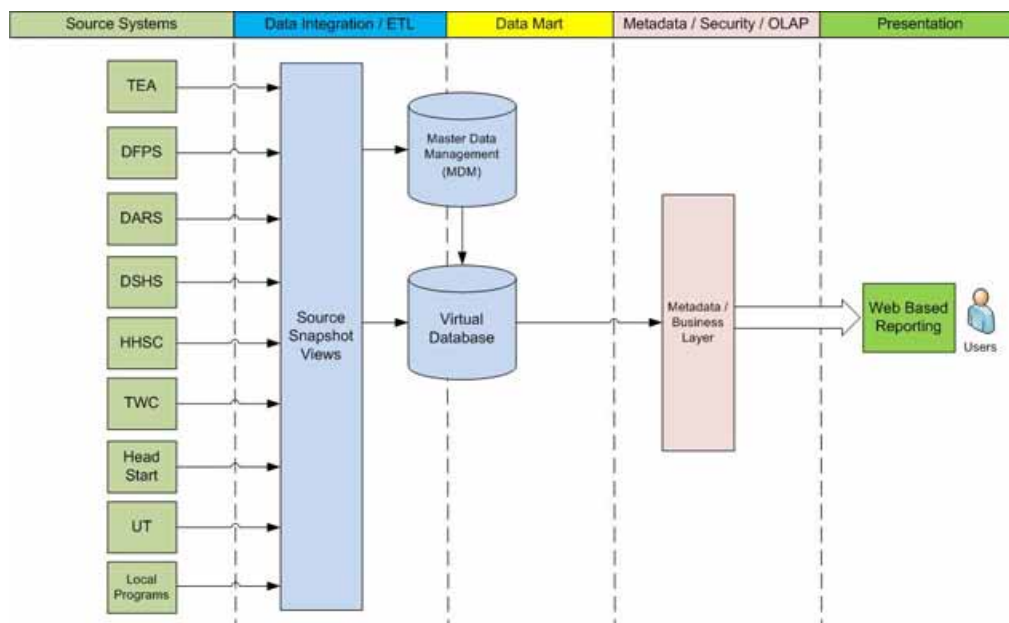


\*ETL = Extract, Transform, Load



## Master Data Management Model

The master data management (MDM) model combines elements of the previous federated model. In addition to keeping the data stored at prospective agencies, it also provides a component for linking the data together by common identifiers. These common identifiers allow for users to link data between sources to answer more robust questions. The following diagram illustrates the master data management model.



The Council recommends building an integrated data warehouse. It provides the ability to answer the most complex questions, identify gaps in service, and identify new questions to ask.

## Hosting at an Existing State Agency

In order to collect, process, and share data, TOTS must reside within a technology infrastructure. During the development process, many conversations discussed where the system would reside. The strategic plan outlined two major options: third party hosting, or hosting at the contracting agency's data center. The strategic plan's scope limited the consultant's work to these two options. As the planning and JRP sessions progressed, other options became evident. After thorough consideration, the Council recommends housing TOTS at a publicly-owned institution, designated by the Texas Legislature. Although third party vendors bring cutting-edge resources to bear, hosting at a public institution provides the accurate public perception of ownership of the application on behalf of the citizens of Texas.

### *Data Recommendation #2:*

**House TOTS at a publicly-owned institution, designated by the Texas Legislature.**

Also, many state agencies are currently developing a data infrastructure for their individual systems. TOTS should build on this infrastructure to keep data in one location.

### Third Party Application Development

The original strategic planning is premised on a work-for-hire arrangement with a third party vendor to create an application for TOTS. In this scenario, the third party writes the code and implements the architecture outlined in previous joint application design sessions. The Council recommends this arrangement, primarily to avoid on-going licensing fees often associated with application service provider agreements. In this scenario any code or programming produced would be the intellectual property of the state which prevents potential disputes associated with intellectual property of software developed by public/private collaborations. The strategic plan recommends a phased development in which smaller modules are created and built upon to include more agency data as the exchange infrastructure becomes more robust. In all scenarios, sustainability funding is required for the phased development and for updating and maintaining developed software.

***Data Recommendation #3:***  
**Contract with a vendor using a work-for-hire contract to create the TOTS application in order to avoid on-going licensing fees often associated with application service provider agreements.**

### Use of Pre-Existing Software Tools

The desire for more commercial entities to translate data into information and knowledge has spawned software innovation in the areas of data integration and analytics. These software fall into two broad overlapping categories: extraction, transform, and load (ETL) and business intelligence (BI). ETL technologies assist in drawing data from various sources (extraction), transforming the data to make it compatible and usable (transform) and storing the combined data in a new system, usually a data warehouse (load). Business intelligence tools provide ways of analyzing large amounts of data combined into single data stores to help organizations make effective, well-informed, data-driven decisions that align with strategic and tactical goals.

***Data Recommendation #4:***  
**Use pre-existing software for data integration and analytics for TOTS, particularly extraction, transform, and load (ETL) and business intelligence (BI).**

The Council recommends the use of these tools for TOTS. Many specific tools are available to perform the ETL and BI components of TOTS. As outlined in the strategic plan, the Council limits its recommendations to identifying these broad categories because the selection of specific tools depends on the design components identified through an adequate application design process. The specific tools would reflect the

requirements generated by the application design sessions and hosting environment selected.

The strategic plan indicates that the technology required to create the application would not require a custom application, but rather modifying currently existing software. Custom applications typically have a high cost due to their labor intensive application design, development, and testing. Modification of existing technologies, while still costly in time and money, reduce that overall cost. Existing robust technology tools allow for rapid development because of industry experience with ETL and BI projects.

The strategic plan also identifies existing technology tools to support the development of TOTS. From a technology perspective, TOTS is feasible. The strategic plan, however, identifies other areas that would require more planning and strategic development to make TOTS a success. Specifically, data governance and funding are required to create an effective TOTS in Texas.

## Data Standards

### Data Sharing

A major component of the strategic plan involved surveying the data structures of Texas health, human service, and educational agencies. This process was accomplished through surveys and interviews with these agencies. Specifically, a consulting group performed the following actions to analyze and document the data landscape of early childhood agencies.

- Identified agencies to participate
- Gathered and analyzed available technical and functional documentation about existing state and federal information systems
- Developed a template of questions to collect additional information including data dictionaries
- Conducted follow up interviews with agency contacts

Most agencies, though not all, participated in the data dictionary gathering process. The results showed significant overlap in the fundamental questions the Council desired to answer with TOTS.

The process also illustrated gaps in participation. All participation in the data gathering was voluntary, and some agencies declined to participate in the process. This gap emphasized the need for additional authority, to facilitate statewide participation in

#### *Data Recommendation #5:*

**Create and fund a Texas early education data governance structure to provide a framework for interagency data sharing.**

TOTS. Agencies cited several reasons for non-participation in the data dictionary gathering process. Among the reasons communicated were shortages of staff to fulfill data dictionary requests, rules against sharing with other agencies, conflicts with current technology procurements, or lack of policy regarding sharing data with other agencies.

Current technologies are able to readily resolve differences among varying agency data sets. Working with predefined data dictionaries and rule sets, ETL technologies can combine data from different sources to common values. This technology means that particular differences in how agencies store data are less of an obstacle to integration than the overarching policies providing obstacles to sharing data with other state agencies. As outlined in the security section of the strategic plan, some agency's internal policies were more stringent than federal security and sharing guidelines.

The Council recommends the creation and funding of a Texas early education data governance structure to provide a framework for interagency data sharing. Doing so will allow agencies to comply with the highest common standards and provide an on-going governance over sharing decisions rather than making sharing decisions on an ad hoc basis.

### Common Identifiers

The strategic plan identified the need to create common identifiers for various levels of data in order for TOTS to provide effective service coordination, effective allocation of community resources, and the ability to answer strategic and tactical questions from a variety of stakeholders. Specifically, the state would benefit from uniquely identifying early childhood programs and children served. TOTS should effectively support an initiative such as this one by providing cross agency identification.

### Program Identifiers

With over 16,000 public and private early care and education programs in Texas, defining and identifying programs can be difficult. Because Texas uses a mixed model of delivery for early care and education, various agencies contribute different resources to programs. For example, Head Start classes may reside within independent school district campuses along with ISD classrooms, though the funding streams are different. Issues can arise when attempting to differentiate between a "program" (e.g. public school pre-k, Head Start, or child care) and the physical building it resides in. Differing agencies tally programs using differing definitions and identify programs within their purview with differing identification schema. A comprehensive assessment of the scope and impact of these early education programs is difficult to make given the disparate systems.

**Data Recommendation #6:**  
**Use TOTS to assist in defining and identifying programs throughout the state.**

The Council recommends using TOTS to assist in defining and identifying programs throughout the state. TOTS should provide guidelines and business rules for consistently defining early childhood educational programs. As a part of the data integration function, TOTS should provide a unique identifier for programs. This unique identifier construct is the key to joining data related to the programs from various systems in order to answer more comprehensive questions about the scope and state of early education programs in Texas.

### **Data Matching**

Just as the number and variety of early education programs complicate comprehensive statements about the state of early childhood programs, similar issues exist with identifying the recipients of these services. Lack of a common identifier, mobility, and name changes across systems all contribute to obstacles in making comprehensive statements on whether children birth to five receive needed services, whether the services they receive are effective in improving school readiness, and whether there are service redundancies throughout the system of services across areas.

#### *Data Recommendation #7:*

**Use a Master Data Management (MDM) hub as a specific technology for identifying and matching child-level data to create a gold standard of identification across data sources.**

Technologies exist for facilitating matching of children across data sources. The Council recommends using a Master Data Management (MDM) hub as a specific technology for identifying and creating a gold standard across data sources. While a MDM hub can automate components of this matching process, dedicated personnel would be required to establish and maintain a “gold standard” of identification across data sources. Since each year a new cohort of children will enter the birth to five age range, establishment of a consistent ID for children will require on-going support and sustainable funding sources.

### **Unique Child Identifiers**

Research tells us that the effectiveness of early childhood programs is tied to children’s outcomes later in life. Other longitudinal data systems relevant after age five also involve the creation of a unique identifier for children. Establishing an early education identifier would facilitate linkage between early childhood services and longitudinal outcome measures.

#### *Data Recommendation #8:*

**Establish a unique early education identifier for each child to facilitate linkage between early childhood services and longitudinal outcome measures.**

## Security and Confidentiality

### Security Principles

Security and confidentiality were overarching themes throughout the strategic planning and requirements planning sessions. Stakeholders voiced concerns about who would have access to shared data and the specific methods that TOTS would use to secure the data.

#### *Data Recommendation #9:*

**Apply the “Highest Common Denominator” security principle in any future design of TOTS.**

Two federal guidelines cover the data collected into TOTS. Family Educational Rights and Privacy Act (FERPA) and Health Insurance Portability and Accountability Act (HIPAA). FERPA covers educational related data. HIPAA covers medical and other protected health information (PHI). Security of data included in TOTS must comply with these guidelines at a minimum.

The strategic plan included a security survey of the participating agencies. The survey found that agencies complied with minimum requirements but that specific agency policies often exceeded these minimum requirements and that respective methods for complying with federal guidelines varied between agencies. As a design philosophy during the requirements planning sessions, the TOTS team adopted a principle of designing security requirements toward the “highest common denominator,” meaning that the requirements should match the highest standard established by participating agencies. The Council recommends application of this principle in any future design of TOTS.

The strategic plan recommends participating and complying with several federal security initiatives to comply with the HIPAA and FERPA guidelines. These standards include Federal Information Processing Standards (FIPS) Publication 140-2 level 2, National Institute of Standards and Technology (NIST) 800-53, and State Identity Credential and Access Management (SICAM) framework. Each of these publications and processes provide security methodologies and standards that TOTS technology implementation would need to fulfill in order to establish security for individual participant’s data.

As mentioned previously, current technology exists to secure participant data; however, a governance structure is lacking. A governance structure is needed to provide a framework and decisions for how data from the various agencies is stored, transmitted, and shared. This entity should also provide a framework for risk management, inter-agency data sharing, compliance requirements, and specific application implementation of security controls.

Specific technology security comes with costs. *Cost* not only refers to traditional cash expenses, but it also refers to encumbrances with accessibility and usability.

Too stringent of a security context reduces usability for end users. A component of the decision making framework will need to balance security costs while maximizing confidentiality for individuals' data.

At the national level, the Nationwide Health Information Network (NHIN ) provides a governance framework for federal entities exchanging information. Rather than storing data, this organization provides a framework for exchange of health data across health entities in a way that protects the security of individual's health data but maximizes the ability of agencies to provide services to participating individuals. TOTS' governance structure should fulfill a similar function for early childhood data within Texas.



## Governance Recommendations

The following section details the governance recommendations generated through the creation of the TOTS strategic plan and the JRP sessions. These recommendations relate to the establishment of a governance entity and governance structure for TOTS, including specific recommendations for the purpose, scope, authority, and sustainability of a data governance structure for Texas early childhood data.

The strategic plan, the requirements process, and requirements documents all indicated the necessity of governance for the creation of TOTS. As the strategic plan indicates, technology constrains the development of TOTS less than the absence of the people, policy, process, and financing components that make up the governance structure for early childhood data in Texas. The remaining sections use the following working definition of governance: *the policies, decisions, funding, and authority required to establish an inter-agency early childhood data exchange system to positively impact the school readiness of children birth to five years.*

Research such as the Data Quality Campaign's paper, "Linking Data across Agencies: States That Are Making It Work" points to the importance of governance in data settings. Inter-agency collaboration provides stakeholders with richer datasets from which to make informed decisions across the early childhood landscape. Governance provides the framework to make that sharing possible above and beyond any technological ability. Technology provides the means to do good, governance provides the directives to do good.

The remainder of this document outlines the steps necessary to establish a governance structure for TOTS. It outlines how a governance structure could benefit Texas' youngest citizens, and it provides a roadmap for establishing this governance.



## Texas Strategy for Early Childhood Data

The Council recommends the following strategy for guiding the governance of early childhood data in Texas. This strategy provides a framework that a governing entity could use in executing its charge to manage the creation of TOTS.

### Answering Critical Questions

As a part of the development process for TOTS, the Council identified eight key questions for the system to answer. These questions should serve as the framework for guiding decisions made by a data governance structure for early childhood data.

1. What is the performance trend of children with respect to different indicators over a period of time? (e.g. demographics, family situation, language, classroom, program participation, pre-literacy, nutrition, health, disability)
2. What are the number and percentage of children with specific at-risk indicators? (e.g. income level, ELL/ESL, single parent family, special education, developmental delays)
3. How aligned is the early childhood workforce with children's needs in different areas?
4. What are the characteristics of the early childhood workforce?
5. What programs are available to children with specific needs in my area and to what extent are these programs utilized?
6. What programs coordinate with other programs to serve children's needs and transition services when needed?
7. How effective are different early childhood programs and services in addressing specific children's needs and improving children's school outcomes?
8. What are the characteristics of early childhood programs? (e.g. curriculum, funding sources, accreditation, staff qualifications, and quality ratings)

The strategic plan surveyed agencies to identify which collected data related to answering these questions. The survey found both overlap and gaps in each agency's ability to answer these questions. Overlap indicates potential to combine data from various sources to provide richer answers to the above questions. Gaps show areas for future collection by the early childhood community. The tables on the following pages illustrate the results of these surveys of both the data collection content areas and the systems that store that information.

Table 1 compares the Council's strategic questions with the data that TOTS would need to collect to answer these questions. This table formed an intermediary step towards a concrete identification of these corresponding data within Texas state agencies.

Table 2 represents the second phase of the search. This table cross references specific early childhood data and the corresponding agencies which house this data. In the table, red circles signify that this agency collects the corresponding data, empty circles signify that this data is out of the agency's scope of work, and question marks refer to agencies that interviews received no response before the deadline for the drafting of the strategic report. The second row of the header rows represents the specific measures or programs that the agency uses for data collection.





Please refer to the abbreviations chart on page 6 for more information.

Table 2 includes state systems in existence at the time of analysis. Therefore there is no mention of the Texas Longitudinal Data System, which is currently in development at the TEA. Once completed, TLDS will serve as a preschool – grade 20 data warehouse, which will help state policymakers and local school districts to “better understand students’ preparedness to contribute to the twenty-first century workforce.” These recommendations recognize the importance of the TLDS and assume a connection between TLDS and any future realization of the TOTS project; however, at the time of analysis TLDS fell outside of the scope of work for the TOTS strategic plan.

**Table 1. Answering Critical Questions**

		Program/Service Information		Teacher/Staff Information		Classroom Information		Assessment Information		Parent/Family Information		Child Information	
	Services/Other Characteristics												
	Accreditations/Certifications/Quality Rating	X	X										X
	HR Information	X	X	X									X
	Geography	X	X	X			X	X					X
	Program Demographics	X	X				X	X			X		X
	Professional Development				X	X							
	Education and Experience	X			X	X							X
	Staff Demographics	X			X	X							X
	Curriculum/Certifications	X	X										X
	Classroom Details	X	X	X									X
	Classroom Assessment				X							X	X
	Child Assessment	X	X	X								X	
	Income	X	X										
	Employment	X	X										
	Family Demographics	X	X										
	Parent Demographics	X	X										
	Medical Information	X	X	X			X	X				X	
	Child Services	X	X				X	X				X	
	Child Demographics	X	X	X			X	X				X	
	What is the performance trend of children with respect to different indicators over a period of time?												
	What is the number and % of children with specific indicators and how are these children doing in school?												
	How aligned is the early childhood workforce with children's needs in different areas?												
	What are the characteristics of the early childhood workforce?												
	What programs are available to children with special needs in my area and to what extent are these programs utilized?												
	What programs coordinate with other programs to serve children's needs and transition services when needed?												
	How effective are different early childhood programs in addressing specific children's needs and improving children's academic achievement?												
	What are the characteristics of early childhood programs?												

**Table 2. Early Childhood Data in Texas**

Agency	System	Data Availability												Legend
		Child demographics	Service related information	Medical information	Parent demographics	Family information	Employment information	Household income	Child assessment	Classroom assessment	Classroom details	Curriculum and certifications		
UTHealth	ECWR	○	○	○	○	○	○	○	○	○	○	○	○	Available  Not Available  ?  Unknown 
	PM	●	○	○	○	○	○	○	○	●	○	○	○	
	SRC	●	●	○	●	○	○	○	○	●	●	●	●	
	TOMS	●	○	○	○	○	○	○	○	●	●	●	●	
HS	PIR	●	●	●	●	●	●	●	○	○	○	○		
TEA	SIS	●	●	○	○	○	○	○	○	●	●	●	●	
	DCD	●	●	○	○	○	○	○	○	●	●	●	●	
	TPEIR	●	●	○	○	○	○	○	○	●	●	●	●	
	PEIMS	●	●	○	○	○	○	○	○	●	●	●	●	
	TSDS	●	●	○	●	●	○	○	○	●	●	●	●	
TWC	TWIST	●	●	○	●	●	●	●	○	○	○	○		
HHSC		?	?	?	?	?	?	?	?	?	?	?		
DFPS	IMPACT	○	○	○	○	○	○	○	○	○	○	○		
	CLASS	○	○	○	○	○	○	○	○	○	●	●		
DSHS	TEHDI	●	●	●	●	●	●	●	○	○	○	○		
	LIMS	●	●	●	●	●	○	○	○	○	○	○		
DARS	TKIDS	●	○	●	●	●	●	●	○	○	○	○		
		Child information	Parent and family information			Assessment information			Classroom information					

**Table 2, Continued. Early Childhood Data in Texas**

		Teacher/staff demographics	Staff education and experience	Professional development information	Program/provider demographics	Geographic information	HR/staff information	Certifications/ accreditations/ quality ratings	Services	
		Teacher/staff information			Program/school information					
UTHealth	ECWR	●	●	●	○	○	○	○	○	
	PM	○	○	○	●	○	○	○	○	
	SRC	○	●	●	●	○	○	○	○	
	TOMS	●	●	●	●	●	●	○	○	
HS	PIR	●	●	●	●	●	●	●	●	
TEA	SIS	●	●	●	●	●	●	●	●	
	DCD	●	●	●	●	●	●	●	●	
	TPEIR	●	●	●	●	●	●	●	●	
	PEIMS	●	●	●	●	●	●	●	●	
	TSDS	●	●	●	●	●	●	●	●	
TWC	TWIST	○	○	○	●	●	○	●	●	
HHSC		?	?	?	?	?	?	?	?	
DFPS	IMPACT	●	●	○	●	●	●	●	○	
	CLASS	●	●	○	●	●	●	●	○	
DSHS	TEHDI	●	○	○	●	●	●	○	●	
	LIMS	○	○	○	○	○	○	○	○	
DARS	TKIDS	●	●	○	●	●	●	○	●	

 Available
  Not Available
  ?
  Unknown

## Usability for Stakeholders

Data systems are only as valuable as the information that they provide to their users. The JRP sessions targeted TOTS user groups: parents, researchers, policymakers, state agencies, program teachers and administrators, and the general public. Given the critical questions outlined in the previous section, the TOTS strategy must provide for establishing a user-friendly portal for these stakeholders to make informed decisions to promote the school readiness of Texas' children. To protect the identity and confidentiality of participants, data must be aggregated to group levels during the presentation.

### ***Governance Recommendation #1:***

**A data governance entity should provide the decision making and guidance to ensure that relevant consumers have access to data to make empirical decisions.**

A data governance entity should provide the decision making and guidance to ensure that relevant consumers have access to data to make empirical decisions; however, data access and usage should be subordinated to security and confidentiality guidelines.

## Data Sharing

As mentioned previously, currently Texas' early childhood data exists in a series of silos. Combining data between these silos occurs on an ad-hoc basis rather than with an integrated framework. One of the chief principles of TOTS is to create this integrated environment. As the strategic plan identified, agencies have differing data structures, security policies and technology implementations. A data governance entity should provide guidance, rules, and a policy framework for facilitating sharing between agencies. With an integrated system, data consumers could better answer the questions outlined previously and generate more rich and comprehensive questions to effectively support school readiness in Texas.

### ***Governance Recommendation #2:***

**A data governance entity should provide guidance, rules, and a policy framework for facilitating sharing between agencies.**

## Identify Information Gaps

The requirements planning sessions identified what users would require of TOTS. During these sessions, users identified specific data that they would need to answer the questions outlined earlier. In many cases, this process identified gaps between the data needed to answer these questions and the data available. In determining the characteristics of early childhood programs, the requirements planning sessions identified teacher training and quality as an area in which little data existed. A data

governance entity should identify these gaps and report back to agencies to influence future data gathering initiatives. In this fashion, the data governance entity can serve as a watchtower to foresee future data collection initiatives that would benefit the quality of early childhood data.

***Governance Recommendation #3:***

**A data governance entity should identify gaps in data and report back to agencies to influence future data gathering initiatives.**

## **Provide Infrastructure Support**

During the strategic planning and requirements process, agencies frequently asked “Who’s going to do the work?” Most, if not all, agencies were dealing with reduced budgets and smaller staff. A project supporting TOTS requires that the Texas Legislature designate resources in support of this effort. In addition, the planning and requirements process identified differences in technological and security levels between agencies.

***Governance Recommendation #4:***

**A data governance entity should fund staff salaries and technological improvements that support all relevant agencies in participating fully in TOTS.**

A data governance entity should not only provide decision making and rules setting, but it should also, with legislative funding, provide material, monetary, and knowledge resources to agencies requiring such resources to participate in TOTS. The data governance entity should fund staff salaries and technological improvements to support all relevant agencies in participating fully in TOTS.

## **Local Data Integration**

One of the technology gaps identified during the planning and requirements were organizations operating outside of state agencies. Smaller community based agencies facilitate the effectiveness of early childcare but investigating the data within these smaller agencies was outside of the scope of the strategic plan. A governance entity should further identify smaller data sources to include in TOTS. The entity should also plan to support the integration of these systems into TOTS.

***Governance Recommendation #5:***

**A data governance entity should further identify smaller data sources to include in TOTS. The entity should also plan to support the integration of these systems into TOTS.**

## Goals of TOTS Governance

TOTS governance accomplishes both general and specific policy goals. An explicit governance structure for early childhood data in Texas would accomplish general policy goals by providing the following components: agency participation, transparency, responsiveness to stakeholders, strategic use of early childhood education (ECE) data resources, and accountability. A governance structure would provide a forum for agencies to participate in the creation of policy regarding early childhood data. In order to facilitate this participation, explicit governance rules should provide for transparency into how early childhood data is managed. These same rules should define the roles of participating agencies and assign responsibility for the management of this cross-agency data. This big-picture view of early childhood data within Texas would allow for a more strategic use of ECE data resources. Rather than working independently in silos, agencies could better identify redundancies, leverage existing data, and communicate with stakeholders as the early childhood environment changes in Texas.

## Implementation

As the strategic plan outlines, specific governance is needed for the operational effectiveness of TOTS. In implementing any data system, a leadership entity must answer tactical questions that emerge as a part of the implementation process. A governance entity should link the strategic vision with the operational realities of implementing an innovative system. Part of these tactical components involves clarifying business rules. As described previously, the transform component of an ETL process involves taking data from various sources and applying coded business rules to these data in order to resolve differences between similar data sets. These business rules are specified during the application design phase. A data governance entity could provide the framework for interpreting these business rules and answering other questions that arise during the implementation phase.

### *Governance Recommendation #6:*

**A data governance entity should link the strategic vision with the operational realities of implementing an innovative system and provide the framework for this integration.**

As the strategic plan illustrates, integrating many systems requires reconciling differences between these systems and making policy decisions for standardizing incoming data. A governance entity should provide the framework for this integration. Specifically the governance entity should provide standards on sharing data, quality of data, establishing an ID system and establishing a “gold standard” for matching programs and children across systems.



## Governance Implementation

Determining the scope of the TOTS governing entity is critical to the effectiveness of the entity. Too large of a scope could hamper interagency collaboration due to territorial issues, while too limited of a scope could hinder the success of providing for a transformational system for early childhood data due to an inability to initiate and carry out change. This section describes specific areas in which the governing entity could provide guidance and decisions. The following section describes a staged approach to implementing this governance entity.

### Administrative Guidance

The governance entity should provide for rulings and guidance on administrative parts of TOTS. These administrative components create the context for TOTS data management, but not necessarily the data management itself.

#### ***Governance Recommendation #7:***

**A governance entity should provide for rulings and guidance on administrative components of TOTS.**

These administrative components should include written guidelines on:

- Policies and procedures for the sharing, management, and securing of data
- Day-to-day operational components
- Establishment of roles of TOTS and the agencies that it interacts with
- Establishment of a risk management framework for assessing, planning for, and mitigating risk for TOTS
- Provide transparency in its workings to establish accountability structure

### Data Management

Within the data components, the TOTS governance entity should provide written guidelines and standards for:

#### ***Governance Recommendation #8:***

**A governance entity should provide written guidelines and standards for the management of the data in TOTS.**

- Storage
- Sharing
- Appropriate use\*
- Access management
- Establishing security and confidentiality of data
- Archiving plans for data when participants exceed early childhood years

\*These guidelines and standards should not contradict existing agency standards.

## Establishment of the TOTS Governance Structure

As addressed previously, the scope of the governance structure is fundamental to TOTS' effectiveness. Key to that effectiveness is the relationship between the governing agency and the agencies it must work with. The Council recommends a phased implementation of a data governance structure in which the relationship with agencies changes over time and project phase. The first phase involves the formal creation of the data governance structure by the Texas Legislature. The second phase involves the creation of Memoranda of Understanding (MOU) between TOTS and the agencies. These MOUs detail the agreements between the agencies regarding security, standards, sharing of data, and oversight. In the third phase, the TOTS governing structure would take on a role of making recommendations, providing implementation oversight, and providing technical support and guidance to agencies to continue their participation in TOTS and to raise the data standards of all agencies. This governance structure would also provide for formal mechanisms to receive feedback from public stakeholders and inform them of the concrete benefits of TOTS.

### Authority

In its initial incarnation, the TOTS project set about to make recommendations to the Governor on the creation of an early childhood data exchange system. This paper outlines the technological requirements and governance requirements necessary to create and implement. As described above, acquiring sufficient authority and funding to establish TOTS is necessary for the long-term success of the system. This authority has three parts: creating the TOTS governance structure, mandating agency participation in the system, and system creation and maintenance.

#### *Governance Recommendation #9:*

**The Texas Legislature should designate a TOTS host agency, along with a mandated interagency advisory board, to guide the work and decisions associated with the creation and maintenance of TOTS.**

A lesson quickly learned during the TOTS requirements planning sessions was that interagency agreement and practice are often difficult to build consensus around. In general, the agencies have the will and impetus to work together, but systemic barriers exist. Among the barriers are accountability structures, agency culture, and lack of resources. Based on the experience of gathering information from the various agencies through both requirements planning sessions and one-on-one interviews, it is clear that in order to make TOTS a reality, one agency, with a legislative mandate and authority, must drive the work. However, there is great risk involved in consolidating that responsibility into one agency, as the nature of TOTS is meant to bring about collaboration and better interagency planning. The risk is that inequalities in authority among agencies, as a result of the creation of TOTS authority structure, may create barriers and cynicism with regards to full collaboration and interagency planning. Because of this risk, the Council recommends Legislative designation of a TOTS host

agency, along with a mandated interagency advisory board, to guide the work and decisions associated with the creation and maintenance of TOTS.

### Acquisition of Authority

TOTS can only be achieved through a legislative mandate and appropriate funding. The Council recommends that the Texas Legislature designate an agency of its choice to serve as the host agency for TOTS.

#### *Governance Recommendation #10:*

**The Texas Legislature should entrust the ultimate authority to make TOTS decisions and enact TOTS policies with one state agency.**

### Advisory Board Representation

In its designation of a Texas agency as a host for TOTS, the Texas Legislature should also mandate that all relevant institutions send representatives to comprise an ongoing advisory board that will serve to shape decisions and data governance rules relevant to the construction and ongoing maintenance and supervision of TOTS. Delegates to the advisory board should be designated by the Commissioners of each respective agency.

#### *Governance Recommendation #11:*

**The Texas Legislature should mandate all relevant institutions to send representatives to comprise an ongoing advisory board that will serve to shape decisions and data governance rules relevant to the construction and ongoing maintenance and supervision of TOTS.**

### Decision-Making Authority

The Council recommends that the Texas Legislature entrust the ultimate authority to make TOTS decisions and enact TOTS policies with one agency of the Legislature's choice. As mentioned above, the Council also recommends the creation of an interagency advisory board to help shape decisions, thus it is important that the Texas Legislature explicitly mandate that the designated agency conference and seek input from advisory members on decisions related to TOTS implementation and ongoing maintenance. However, equally important, the Texas Legislature should explicitly state that ultimate decision making authority resides with the legislatively designated agency.

### Interagency Agreements

During the second phase of the TOTS governance structure development, the designated agency should coordinate the creation of interagency MOUs. These MOUs will provide the framework for interagency data sharing. Currently these

sharing agreements are created on an ad hoc basis between individual agencies. A comprehensive framework could facilitate interagency sharing above and beyond data available in TOTS. The designated agency should be mandated to coordinate these agreements with all relevant agencies; relevant agencies should be mandated to participate in the creation of these agreements.

### **Memoranda of Understanding**

The MOUs created should establish the rules governing the sharing, standards, and security of data from agencies. Specifically, the MOUs should determine the scope, definitions, policies, procedures, maintenance, and oversight of the data sharing. *Scope* refers to defining the agencies and stakeholders included in the agreement. *Scope* also describes their relationships, as well as the user access level, to the data. *Definition* refers to the operational and technical terms associated with data sharing and frequency. These should include defining acronyms and technology specifications. *Policy* refers to the circumstances of use of the TOTS data and the context in which the governing entity makes tactical decisions regarding use of data. It also references the authorization to access data. Procedures outline the steps necessary to exchange, secure, and allow access to data. It also refers to any financial arrangements between agencies. Maintenance specifies responsibilities to maintain equipment, software, licenses, and security protocols to ensure that privacy and confidentiality agreements are upheld. Oversight outlines the governance of the data and defines the roles and responsibilities of TOTS and the agencies in deploying and ensuring the ongoing effectiveness of the system.

#### **Governance Recommendation #12:**

**The Texas Legislature should mandate the designated agency to coordinate agreements between all relevant agencies; relevant agencies should be mandated to participate in the creation of these agreements.**

### **Establishment and Maintenance**

The last phase for establishing the TOTS governance structure is for the designated agency to transition to TOTS creation and maintenance. The designated agency should have the ultimate authority to execute the MOUs, purchase needed infrastructure, hire needed staff, and create TOTS. Additionally, the designated agency should have the ultimate authority to provide for the ongoing maintenance of the system as well as interagency compliance with TOTS MOUs.

#### **Governance Recommendation #13:**

**The Texas Legislature should provide authority to the designated agency, as well as the appropriate funding, to create and maintain the TOTS governing entity.**

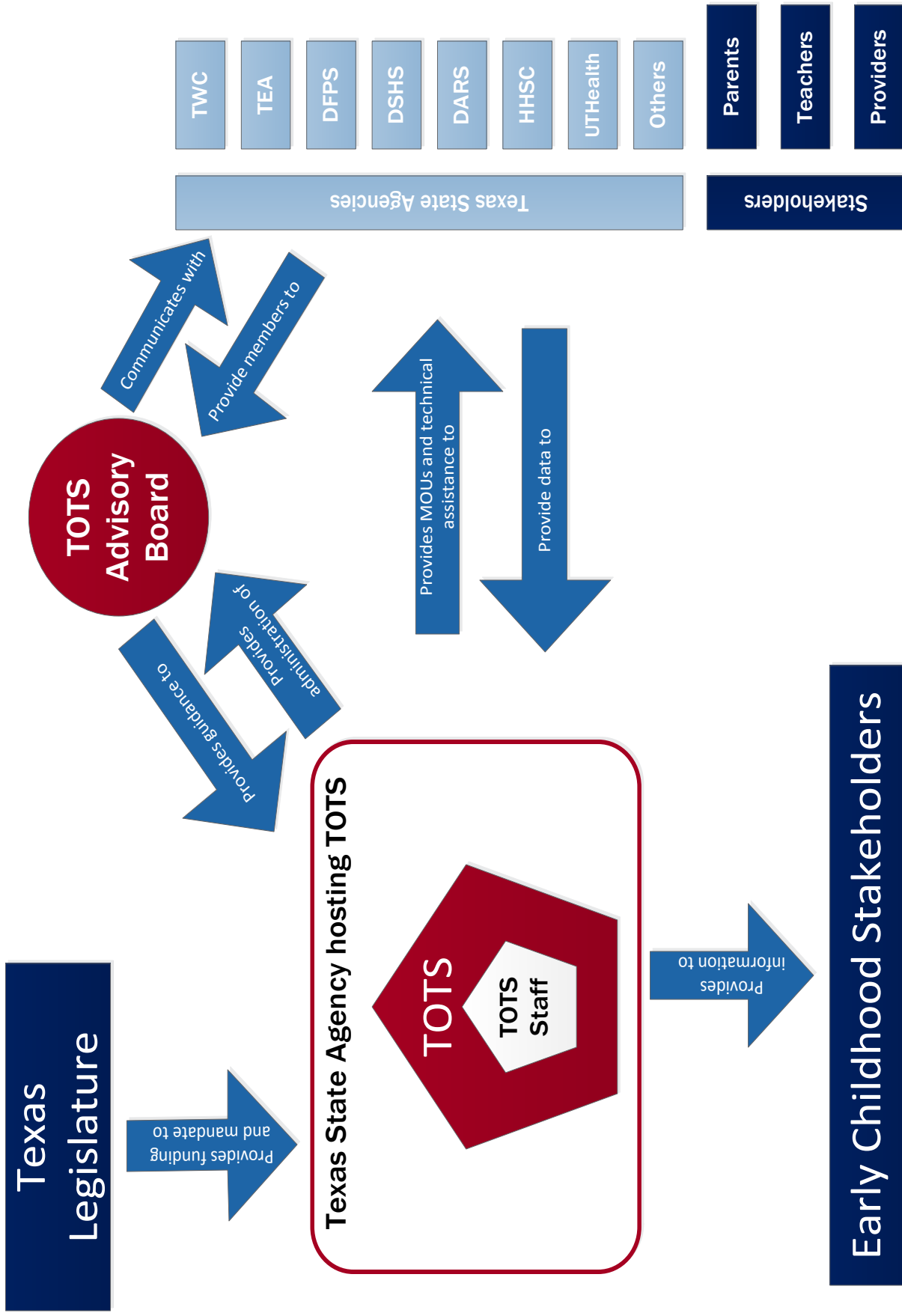
Due to the nature of TOTS as an interagency system, the designated agency will need the authority and financial resources to assist other agencies in upgrading, strengthening, and maintaining their data systems. The Council recommends that the Texas Legislature provide this authority to the designated agency, as well as the appropriate funding to carry out its creation and ongoing maintenance.

With regards to assistance to other agencies, as issues arise, the designated agency should conference with involved agencies and work to resolve issues. Additionally, when TOTS begins to produce efficiencies and identify redundant data collection, the TOTS designated agency should make statewide recommendations to agencies on data collection and management efforts. When Federal rules evolve, the governing entity should provide TOTS relevant interpretation of these rules to reduce discrepancies and excessive variation in interpretation amongst all relevant agencies. These guidelines should be binding for all relevant agencies contributing data to TOTS.

As mentioned previously, if legislatively funded, the governing entity could distribute resources to state and local agencies to achieve many purposes. The funds should help support the updating of agency infrastructure to raise the levels of security and accessibility throughout the state. The funds should also support technical assistance support from the designated agency to the other relevant agencies.

On the following page is a graphical representation of the proposed governance structure for TOTS. The chart relates the state agencies, the legislature, and early childhood stakeholders, and their respective roles, to TOTS.

# TOTS Governance Chart



## Funding

A designated host agency for TOTS requires sufficient resources to conduct its primary mission. These resources include a staff with sufficient, specialized expertise to establish and maintain and govern TOTS. The Texas Legislature must commit to ongoing TOTS funding in order for the project to be successful. Below are estimated funding levels for four years.

		Year 1	Year 2	Year 3	Year 4
<b>Contract</b>	Joint Application Design	\$200,000			
	System Design		\$600,000		
	System Implementation (i.e. coding, testing, installation)			\$2,400,000	
	System Maintenance				\$75,000
	Licensing Software		\$300,000	\$300,000	\$300,000
<b>Equipment</b>			\$700,000	\$10,000	\$10,000
<b>Personnel</b>	Legal Counsel	\$150,000			
	Project Manager	\$100,000	\$100,000	\$100,000	\$100,000
	Data Architect	\$75,000	\$75,000	\$75,000	\$75,000
	Data Manager	\$75,000	\$75,000	\$75,000	\$75,000
	Data Application Designer	\$75,000	\$75,000	\$75,000	\$75,000
	Administrative Staff	\$7,500	\$7,500	\$7,500	\$7,500
<b>Administrative Support</b>		\$45,000	\$45,000	\$45,000	\$45,000
<b>TOTALS</b>		<b>\$727,500</b>	<b>\$1,977,500</b>	<b>\$3,087,500</b>	<b>\$762,500</b>

These estimates were derived from two sources. The initial consulting contract and RFP process provided estimates of the Joint Application Design sessions. The second source of estimate data derived from federal applications for statewide longitudinal data systems (SLDS). These estimates match the scope and complexity of the TOTS system and organizational structure.

This budget reflects several constraints. These estimates reflect budgeted figures. Actual amounts vary between 25% of budgeted amounts. On-going maintenance costs after year 4 would amount to 20-30% of the start-up costs. These costs reflect the direct costs and approximate fringe rates of the hosting agency but do not account for costs borne by the participating agencies. Participating agency costs would include expenses for legal, program, and IT support.

### Governance Staff

The designated agency will need specialized skills to establish and maintain and govern TOTS. The interpretation of federal and state privacy and confidentiality laws arose frequently as a topic during the strategic and requirements planning. A staff attorney available to provide interpretations of security laws would assist the governing entity in establishing the MOUs as well as on-going decision making.

Technical staff are necessary as well. Data managers are needed to manage the established business processes and make modifications as needed to that process. Application developers are needed to establish, maintain, and update the public interface of the system. A critical component of the proposed business process is staff to create the gold standard when matching programs and children across systems. Though technology has evolved to a degree sufficient to automate much of the matching process, skilled human labor has the semantic understanding to resolve discrepancies, update business rules, and establish the gold standard for matching these levels of data.

Administrative staff is necessary to support the governing entity. Qualified leadership, management, and support staff are necessary to provide the foundation upon which the governing entity can conduct its business.

### Agency Staff

As identified in the planning and requirement phases, agencies would need external support to provide the early childhood data to TOTS. Technical assistance would include both technical and administrative components. The technical staff makes modifications to their existing systems to provide data for TOTS. The administrative staff liaises with the TOTS governing entity for project management duties and clarification of rules.

### Sustainability

In order for the designated agency to sustain TOTS into the future, the Texas Legislature must provide funding for resources to the necessary components. Two critical concepts must be adhered to to ensure the sustainability of TOTS.



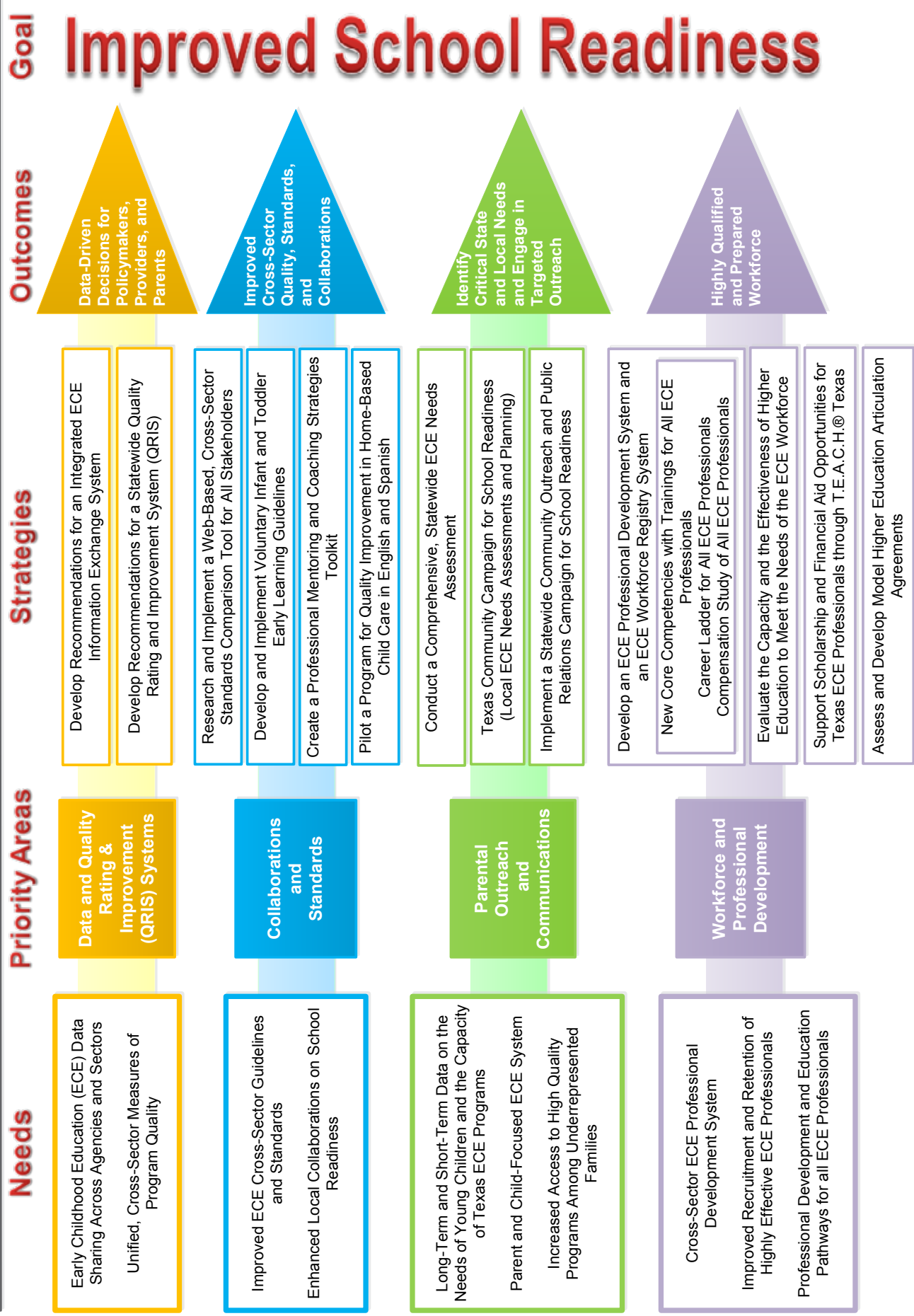
First, the funding should be perceived as a long-term infrastructure investment. As each cohort moves through the 0-5 age range, the improvement in services will have a long-term impact on the school readiness of these children. The first cohort benefiting from TOTS would take more than three years to show its full impact. Each year of improvement contains a delay before the impact is perceived. Milestone metrics can illustrate the achievement of incremental goals but the overall impact is long-term. Just as roads and highways help Texans move around the state, TOTS helps stakeholders make the best decisions for Texas' youngest population. Systems must continue to upgrade and improve over time, so the financial commitment from the state must be ongoing.

Second, the State of Texas should own the intellectual property of TOTS. For the application, ownership of the code entails more costs in the development phases but the maintenance costs reduce over time. Vendors who provide application service provider agreements or licensing arrangements receive fixed payments for the duration of the system. While ownership of the application entails maintenance costs over time, the total costs for a system over decades is significantly less expensive than paying licensing and service provider agreements over time. Hosting of the system has more flexibility. As the state creates more of a shared technological infrastructure, the resources required for hosting become less expensive and more stable. Third party hosting has benefits in terms of upgrading and maintenance costs shifted to the private company. Yet, smaller hosting companies carry the risk of acquisition by larger firms and the number of tier 3 and type 3 hosting companies diminishes and may be prohibitively expensive over a long duration.



## Texas Early Childhood Path to School Readiness

The Texas Early Learning Council is working towards the goal of improving school readiness in Texas by identifying needs and priority areas in the early care and education system, developing strategies for improvement, and facilitating high-quality outcomes.





# **The On-Track System (TOTS)**

## **Early Childhood Data Systems Recommendations Report to Governor Rick Perry**

Texas Early Learning Council  
October 2012

[www.earlylearningtexas.org](http://www.earlylearningtexas.org)