



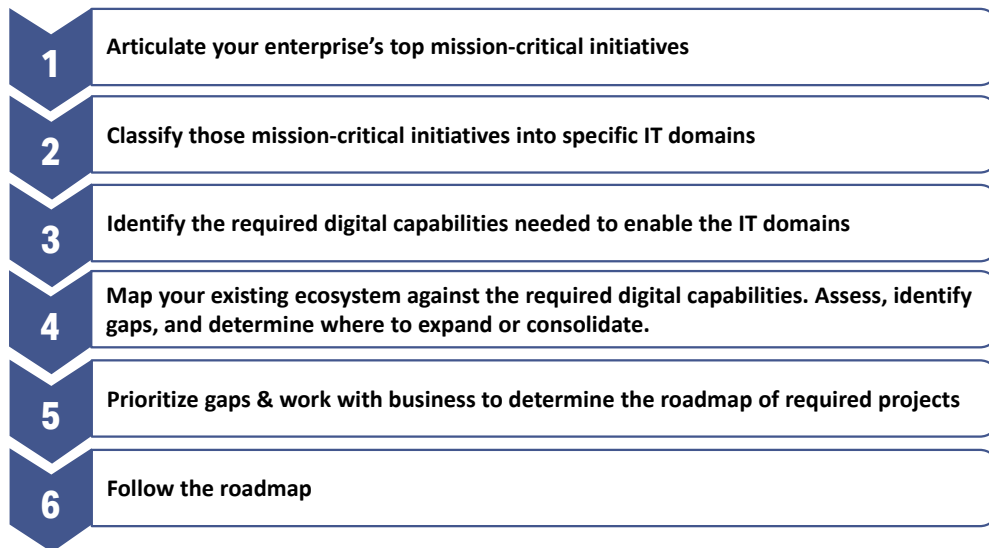
# **ENTERPRISE TRANSFORMATION: CREATING A TRANSIT CIO'S ROADMAP TO OPERATIONAL EXCELLENCE**

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# Introduction

Enterprise transformation, disruptive technology, predictive analytics, Internet of Things, enterprise visibility... As the CIO of a transportation organization you're faced with enough technology buzzwords to make your head spin. From transit passengers to front-line maintenance workers, the stakeholders that matter to your organization demand easier access to better information. As the C-level leader in charge of your organization's IT strategy, how do you determine where to apply your agency's limited financial and human resources? How do you integrate the potential and promise of new technology and best prepare your organization for the future? How do you build consensus and keep those demanding stakeholders happy?

This six-step framework provides a roadmap to operational excellence that aligns your IT department with the needs of your stakeholders and leverages your leadership role in transforming and continuously improving your transportation organization.



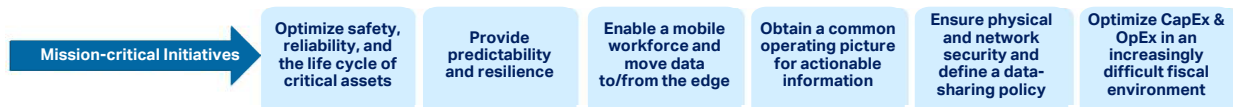
This framework assumes top leadership in your organization has at least some level of consensus on the strategic direction that drives the enterprise mission. Perhaps it is best-in-class customer experience, or improved community standard of living, or achievement of ISO55000 certification. Whatever that strategic direction is, it is naturally being pursued through initiatives and objectives that are at different stages of maturity and which involve various departments and stakeholders. This six-step framework is not intended to replace those initiatives. Instead, the intention is to ensure those initiatives and objectives are woven into the framework and supported appropriately.

Transformation is change. The success of this framework is greatly enhanced if you, your IT department, and your organization have embraced an organizational change management methodology. For the purposes of this article, we will assume that you, as the CIO, are familiar with organizational change management and members of your team actively engage with representative stakeholder groups and the governance activities that support the interests of those groups.



# Step 1: Articulate your enterprise's top mission-critical initiatives:

Today's transportation organizations play a unique role as an economic growth engine and a facilitator of improved quality of life. Although every transportation organization's mission is as unique as the regions they serve, they often share common strategic directions and objectives. In Step 1, you will break these down into the discrete initiatives that drive your asset-intensive organization. For many transportation organizations, this will be similar to the mission critical initiatives captured below.



**Optimize safety, reliability, and the life cycle of critical assets:** As an incredibly asset-intensive organization, the investment in your agency's network of roads, track, fleet, signs and signals, power, facilities, and materials is immense and under intense scrutiny. That network is either the engine of economic growth or the proverbial pothole of citizen frustration. Every employee in the organization must be laser-focused on optimizing the life cycle value of that asset registry and ensuring safety for the people using and maintaining those assets.

**Provide predictability and resilience:** Today's transportation organization maintains multiple asset classes and must be resilient to perils that range from natural and man-made disasters to urban sprawl and from political storms to crushing budget constraints. The organization must get better at predicting where problems will occur before they disrupt service. Transit organizations must have analytics capabilities to determine where to invest scarce resources and they must be able to account for how those investments perform. As CIO, you need confidence in your data before making your recommendations to prioritize spend on a capital improvement program, a new IT system, employee retention and training, or maybe on preparing for an era of connected vehicles.

**Enable a mobile workforce and move data to/from the edge:** A transit agency cannot run efficiently on old-school paper inspections and printed work orders. Data must be gathered and disseminated "at the edge", where the work occurs. Condition assessment data must be captured on the fly, validated, and the best possible business action must be put into effect with the least burdensome human intervention. In the next 10 years, a large portion of vehicles on the road will be connected to the internet in one form or another. In addition to passenger and cargo conveyance, those vehicles will become data collection tools. What useful information can be gathered from that technology?

**Obtain a common operating picture and turn data into actionable information:** Organizations are awash in data but starving for practical information. Departments become attached to legacy systems that do not integrate at the enterprise level. There are very few enterprise-wide tools that each of the business units within an agency is willing to use. Financial resources and asset modernization programs typically go to whoever is screaming the loudest rather than investments being made on sound analysis. These data silos impair enterprise visibility and hinder effective allocation of resources. An enterprise-wide common operating view provides situational awareness and prepares the organization for better decision making.

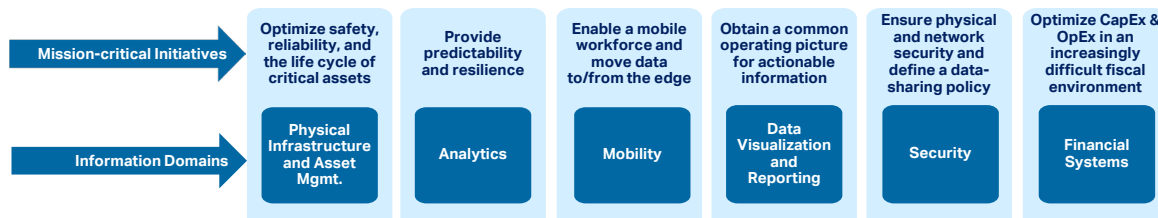
**Ensure physical and network security and define a data-sharing policy:** Your organization faces ever-changing cyber threats that were unfathomable a decade ago. The Industrial Internet of Things (IIoT) presents opportunities to logically connect disparate assets but those connection points are also vulnerable to illegitimate intrusion. Transit organizations need to be secure and resilient, but they need to balance security with public transparency and agency accountability.

**Optimize CapEx and OpEx in an increasingly difficult fiscal environment:** Transportation organizations are expected to do much more with much less. Political environments and social media can elevate a small viral outbreak of citizen discontent into a public relations epidemic. Accountability for investment and financial performance is essential.

Your job as a transportation CIO hugely influences how well your organization functions and serves its stakeholders. In addition to your daily duties of managing the IT infrastructure, network operations, and technical staff, you must execute against a well-conceived and integrated plan for enabling each of the mission-critical initiatives listed above.

## Step 2: Classify those mission-critical initiatives into specific IT domains

Understanding the mission is essential for everyone in the organization, but the CIO must deliver the tools and technical capabilities that enable that mission. In Step 2, you classify each of these outcomes into specific IT



domains. For example, as shown in the figure below.

Step 2 enables you to organize the mission-critical initiatives into broad but essential categories that are worthy of their own representative governance teams and processes. Individual IT domains are often managed at the day-to-day level by a discrete group within IT departments, with input and regular interaction from various lines of business. Classifying the initiatives into their respective IT domains supports the next step of translating those domains into specific required technical capabilities.

## Step 3: Identify the required technical capabilities needed to enable the IT domains

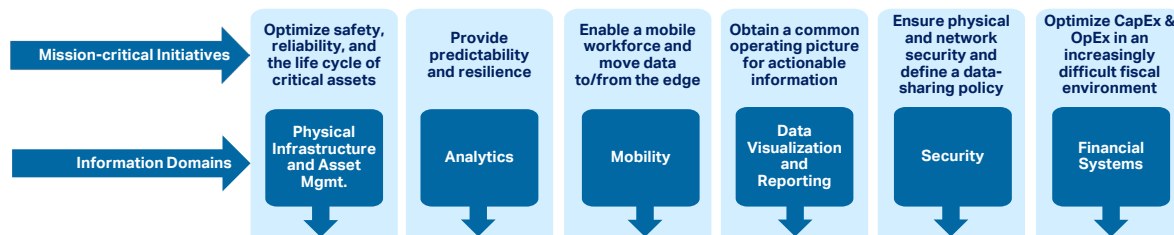
IT domains serve as the broadest levels of the enterprise architecture taxonomy. Step 3 requires you to determine what generic types of tools and technical capabilities your organization needs to support these IT domains. This requires significant interaction with stakeholders and departments to understand the data that is useful, available and in which formats it is best consumed.

If you were building an organization today, from scratch, you could theoretically provision many of the required capabilities within a particular IT domain with a single platform solution. However, most transportation organizations have spent years accumulating potentially overlapping point solutions. Those point solutions may have solved individual problems at one time, but often result in IT redundancies and sub-optimized administrative costs. Even in the best of situations, they rarely integrate fully into clean delineation of IT domains and efficient enterprise architecture. Without appropriate planning, a CIO is often burdened in subsequent years with spending scarce resources to rationalize and consolidate the number of point solutions to remove redundancy and obsolescence.

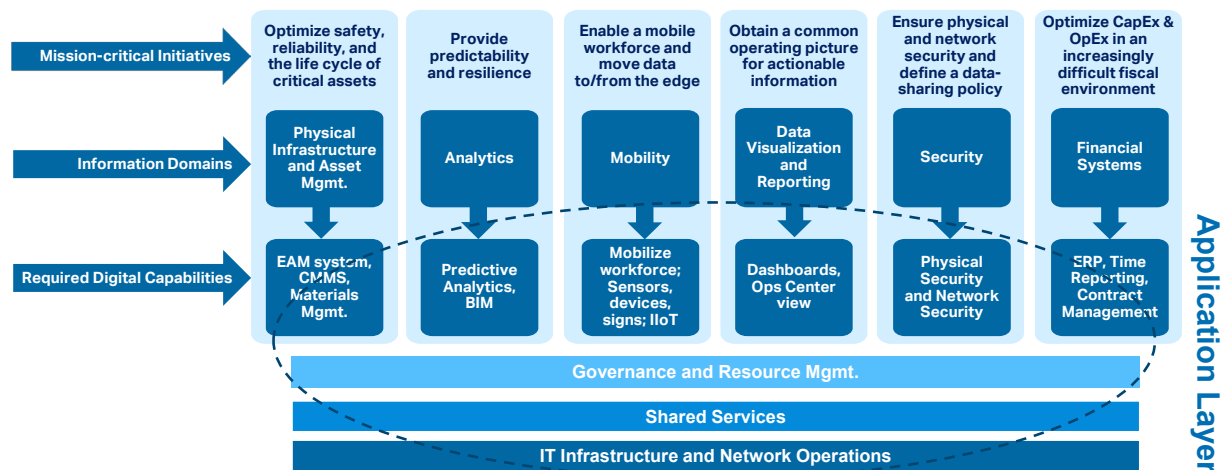
Once the required technical capabilities are identified, most organizations jump right into a succession of RFPs for technical solutions. That approach is problematic. It often leads either to a disjointed splatter of siloed systems that are hard to integrate and maintain, or to the business units being pressured to use shelf-ware which they will not adopt. Instead of attempting to identify and immediately procure the perfect tool for a specific required capability, the transformation-minded CIO will focus first on what organizational capabilities and competencies are required in each of the IT domains and then look for the solutions that best map to the enterprise architecture.

Enterprise architecture – two words that often suggest complexity and confusion. Do we really have to map out the entire enterprise architecture (EA) before we start rolling out point solutions to enable these capabilities? Yes and no. EA is both a journey and a destination. By definition, EA must encompass the business architecture, the technical architecture, and the data architecture. But these enterprise-level architectures must be layered across the people, processes, and technologies that define your organization. Like the organization it supports, an EA is constantly evolving. The transformation-minded CIO will resist the urge to procure a solution until he or she can articulate exactly how that solution fits into the overall EA.

So here is where you, as a transportation CIO, really exercise your leadership skills. The transformation-minded CIO enlists a small cadre of trusted advisors made up of deputies, department heads, and dependable consultants to review existing IT investments, identify gaps in the EA, and look for force multipliers where a single platform can fulfill multiple needs. This task requires discipline to look beyond the latest disruptive technology and focus on building the organizational capabilities and competencies needed to meet the strategic mission.



Eventually, your team will create a single vision that pulls these steps together into a strategic point of view. As illustrated in the example below, the required capabilities represent the broad solution requirements for the application layer that you, as the CIO, must deliver to your organization.

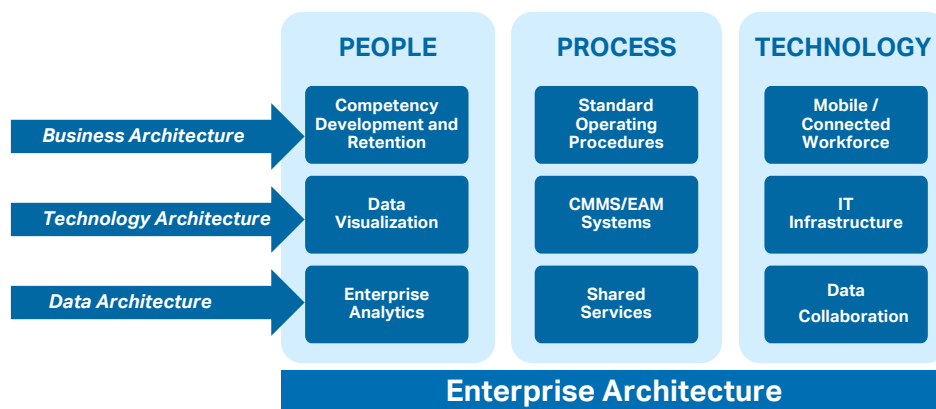


## Step 4: Map your existing ecosystem against the required capabilities. Assess current systems, identify gaps, and determine where to expand or consolidate.

We know that most of today's transit agencies are cluttered with dozens of potentially redundant systems and point solutions. One well-known American mass transit provider regretfully admitted to having over 40 different asset management tools in production and over 600 unique instances used in the daily maintenance operation of their core assets. Imagine the complexity of maintaining support and current versions for all those systems. Imagine the HR costs in retaining institutional expertise in 600 systems. What could be accomplished with the savings if you were able to neutralize just the costs of the required hardware and server licenses? And then recognize the obvious fact that many of these systems could be retired or consolidated.

Every CIO is thinking about system consolidation these days, but taking an honest inventory and assessment of the existing deployed solutions can be a logistical and political nightmare for the CIO office. Just hint to the workforce that you are assessing the efficacy of one of their preferred legacy systems and you might receive a visit from the group's collective bargaining representatives. Discretion is valor in this case. There are ways to accomplish an IT inventory without causing too much ruckus. For example, a strategic engagement to consider a centralized IT Asset Management Help Desk is a good, below-the-radar way to get your arms around the relative utility of all the systems that populate your enterprise. And at the same time, your CIO organization might be able to provide an upgraded benefit in system support to the users.

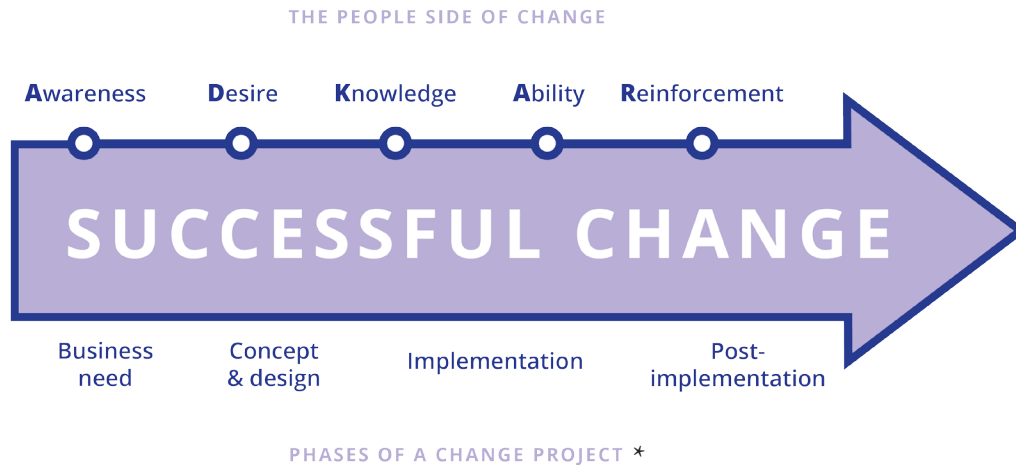
When beginning the rationalization process of determining which systems should be retired, consolidated, or enhanced in Step 4, it is helpful to consider the matrix below. Each of the organization's existing legacy systems and required capabilities will fall into one or more of the blocks. If a software solution doesn't map to the matrix, then you need to ask your team why that system is being maintained and not retired. Some capabilities may fall into numerous blocks. That could mean either that the capability is so pervasive that it should be at the pinnacle of your focus, or it could mean that you have defined the capabilities too broadly. Likewise, if you find a matrix block with no required capabilities, then you are probably missing something important. Leading your team through this discussion can pinpoint any areas that need further review.



## Step 5: Prioritize gaps and work with business units to determine the roadmap of required projects

In Step 5 you must lead by consensus. It will not be easy to get the business units to agree to retire and replace certain legacy systems or to reach compromise on new enterprise-level tools. Once there is agreement to make changes, your team will need to employ all their diplomacy skills to get the various business units to agree on the sequencing of these transformational changes.

Recognized organizational change management methodologies should be well entrenched in the process by this point. For example, using Prosci's ADKAR® model, the organization should already be past the awareness stage and into the desire and knowledge stages.



In a well-managed transformation program, the IT department and the business units will have been deeply integrated in governance activities and in the process of deploying a standardized foundation for assessing the efficacy of, or gaps within, the EA across the entire organization. The entire C-suite will be engaged and supportive. Other critical stakeholders will be informed and accommodating. The organization's leadership will come together in a way that supports the strategic mission goals and the day-to-day operations at the business unit level. Obviously this future state is easier to envision than it is to accomplish. With proper planning and the right guidance, and a robust Organizational Change Management program, an organization will rally around transformation that provides tangible benefits to every stakeholder from the front-line worker to the citizen end-user.

## Step 6: Follow the roadmap

Steps 1-5 provide the waypoints to help you create your integrated IT roadmap. This living document needs to be adopted by the individual business units as well as the IT department. It will also require the explicit support and appropriate push from the other C-suite officers and the accommodations from each of the stakeholder groups. All stakeholders must recognize the necessity to build the transformation brick by brick across the people, processes, and technology that define the organization.

## Conclusion

As a C-level leader and as the person most responsible for your organization's IT strategy, it is your role to optimize the organization's enterprise architecture, develop consensus, oversee the roll-out of the IT roadmap, and lead the execution of a portfolio of projects that will enable operational excellence. In doing so, you will prepare your organization for future challenges and hone the working model for the efficient integration of IT and Operations. The six-step approach above provides the framework for aligning the IT department with the business and all stakeholders. It is designed to leverage the CIO's leadership role in the continuous strategic transformation of the 21st century transit organization.

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## About the Author



As Managing Principal, Jesse Rothkopf leads Life Cycle Engineering's Transportation and Non-Manufacturing consulting practice. Jesse and his team work with public and private sector clients to align the people, processes, and technologies that make up today's complex enterprises and guarantee effective global strategies establish a persistent culture of competence. Jesse and his team recognize that the industries we serve require a community of professional expertise and we develop mutually beneficial relationships with 3rd-party organizations that enable our clients to meet the challenges of today and tomorrow.

## About LCE

Life Cycle Engineering brings 40+ years of asset management excellence serving large and complex clients across the Defense, Transportation, Power Generation, Life Sciences, Aerospace, Food and Beverage, Oil & Gas, and Mining and Metals industries. Our team of experts understand how related asset management processes and capabilities such as Management of Change, Work Management, Asset Criticality, and Reliability Engineering, should be aligned and integrated to achieve maximum benefit for our clients and their key stakeholders. In 2017, LCE proudly celebrated our 40th year of operation serving clients; it is only by delivering consistent, meaningful change and results to our clients that we have been able to reach this significant milestone. LCE has achieved the following endorsements, credentials, and licenses.

