

# Inland Port Transportation Evaluation Guide



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Robert Harrison  
John McCray  
Russell Henk  
Jolanda Prozzi

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# **INLAND PORT TRANSPORTATION EVALUATION GUIDE**

by

Robert Harrison, Center for Transportation Research, The University of Texas at Austin;  
John P. McCray, The University of Texas at San Antonio;  
Russell Henk, Texas Transportation Institute, The Texas A&M University System;  
and Jolanda Prozzi, Center for Transportation Research, The University of Texas at Austin

**CENTER FOR TRANSPORTATION RESEARCH**  
Bureau of Engineering Research  
**The University of Texas at Austin**



**Table of Contents**

OVERVIEW ..... vii

ACKNOWLEDGMENTS ..... vii

1. Background and Introduction ..... 1

2. TxDOT Project Development Process..... 2

3. Inland Port Classification..... 5

    Background..... 5

    A. Preparation ..... 7

    B. Establishment..... 9

    C. Expansion..... 10

    D. Stabilization ..... 11

    E. Decline/Innovation..... 12

4. Summary ..... 13

APPENDIX..... 15



## List of Figures

Figure 2.1 Participants in Planning Process.....	3
Figure 2.2 TxDOT Project Development Process .....	4
Figure 2.3 New Funding Category Structure (Draft as of July 2002) .....	5
Figure 3.1 Inland Port Lifecycle .....	6
Figure 3.2 Stage One – Preparation .....	8
Figure 3.3 Stage Two – Establishment .....	9
Figure 3.4 Stage Three – Expansion .....	10
Figure 3.5 Stage Four – Stabilization .....	12
Figure 3.6 Stage Five – Decline/Innovation .....	13



## OVERVIEW

Inland ports are now being proposed as elements of national and international trade transportation corridors, logistic systems, and new security processes. This guide is intended to inform those proposing or supporting the development of inland ports in Texas of the role the Texas Department of Transportation (TxDOT) could play in addressing the transportation needs of the facility site. An inland port classification system, developed as part of a TxDOT research project (0-4083), links proposals to the TxDOT project development process that is used to understand modifications to the highway infrastructure. With this information, proponents of new schemes will better understand TxDOT's procedures and can therefore anticipate and prepare data, material, and supporting documentation to ensure that their submission will be expedited.

The Guide is structured into four sections. First, an introduction is provided to research project 0-4083. Next, a description of the TxDOT project development process is given; then an inland port classification process is introduced, which gives both the inland port proponents' and TxDOT planners' perspectives at different stages of growth. Finally, a summary is given together with appendices covering supporting material. More detailed information on inland ports can be found in TxDOT research reports 0-4083-1, *The Identification and Classification of Inland Ports*, and 0-4083-2 *Inland Ports: Planning Successful Development*.

## ACKNOWLEDGMENTS

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## **1. Background and Introduction**

Growth in the global economy over the last two decades, new manufacturing and agricultural production, and new marketing techniques have increased the need for efficient transportation services. These services are important because manufacturing is now located worldwide to reduce labor costs and efficiently place distribution centers along global supply chains. Production systems now require frequent shipments, precise scheduling, and time definite logistic characteristics. Furthermore, focus has shifted to limiting the number of distribution facilities, which serve national, regional, or metropolitan markets. Requirements such as these depend on reliable transportation services. Consequently, companies are focusing on ways to reduce their transportation budgets with respect to travel times and monetary costs. Furthermore, the events of “9-11” have introduced a “security need” into the global supply chains that move products into the United States.

Inland ports are beginning to attract attention because they can provide the means to optimize transportation-related costs associated with supply chains. By providing multi-modal combinations at inland ports, new opportunities to control efficiency are introduced. Additional opportunities occur when “value-added services” are located at an inland port.

At inland ports, transportation capabilities in the form of access to the interstate highway system, intermodal rail facilities, or air cargo operations are viewed as building blocks for businesses seeking competitive advantages. They allow businesses the feasibility to choose the appropriate modal alternative(s) for their logistics needs. As supply chains become more complex, businesses look for ways to reduce the number of links in the chain by incorporating a variety of components at locations such as inland ports. For example, when distribution, warehousing, and manufacturing are located together at an inland port, uncertainties related to “just-in-time” systems are reduced. These uncertainties could relate to customs processing and border delays, which can be reduced at an inland port because these functions can be better managed at the inland site. Overall, an inland port can be seen as a location where transportation capabilities, combined with value-added services, allow businesses to compete more effectively.

The Texas Department of Transportation (TxDOT) recognizes the potential impacts of inland ports on local, regional, and national trade and transportation corridors. Transportation planners recognize that a reduction of congestion in land corridors is essential in supporting both international trade and efficient supply chains. Moreover, it is critical that the transportation requirements of industry are considered in the framework of transportation planning.

The results of study 0-4083 suggest that inland ports pass through several developmental phases as they grow and occupy a more important place in business supply chain decision-making. This guide is intended to help those individuals who are promoting specific inland port sites in Texas. It recognizes the important role that TxDOT plays in providing transportation infrastructure and attempts to guide those interested in seeking TxDOT’s assistance as to how best this might be achieved.

Interest in transportation corridors and inland ports appears to be growing. Although fully developed inland ports are relatively few in number, they are likely to play an important role in developing Texas trade corridors and maintaining their efficiency. Groups impacted by inland port proposals view them in a variety of ways. Planners are concerned about the location and ability to interact with critical transportation networks in metropolitan areas served by the facility. The business community (often represented by the local Chamber of Commerce) is focused on growth and employment opportunities, as well as providing additional incentives for major companies to relocate to the region and invest in the community. Local politicians are

generally concerned with the tax base employment prospects for their community. Those supplying services (railroads, airlines, and truckers) are focused upon efficient distribution and the ability to compete in the local market. TxDOT's focus is its central mission to provide safe, effective transportation services in the state. By supporting the concept of inland ports, TxDOT can seize the opportunity to advance multi-modal planning objectives and move products on modes other than highways.

While a wide variety of objectives are invoked in an inland port proposal, this guide concentrates on the provision of highway infrastructure to a site. It is organized in a way that matches the long-established planning process developed within TxDOT for developing highway infrastructure projects and is combined with the different stages of inland port growth noted by the researchers in study 0-4083. It highlights the information that TxDOT needs from proponents at the various phases of inland port development and specifies what could be expected from TxDOT's Districts in response to such information. The guide ends with a summary and indication of future developments in the incorporation of inland ports into the statewide transportation plan for Texas.

## **2. TxDOT Project Development Process**

The Texas Department of Transportation (TxDOT) project development process (PDP) is part of a federally-mandated, legally-established method to ensure fair and equitable planning for and funding of projects to improve the transportation infrastructure with the use of public funds. This process is divided into the two major descriptive functions of "planning" and "programming" (described in more detail subsequently). In order to better understand this entire process, it is helpful to first understand the context and dynamics (both jurisdictional and technical) associated with this process.

Participants in the overall planning process for transportation projects are illustrated in Figure 2.1. As noted in the figure, numerous entities are involved in the overall process in its broadest sense and include, but extend beyond, TxDOT. Particularly important participants in this overall process are TxDOT and the Metropolitan Planning Organization (MPO), especially in relation to publicly-funded transportation projects that might influence the development and/or operation of an inland port. Transportation projects (expanded upon in more detail in TxDOT Research Report 4083-2) include improvements to any and all publicly-funded efforts at the city, state, and county levels in a respective metropolitan area. These projects include traditional roadways as well as projects that support other modes of transport such as transit, bike paths/lanes, sidewalks, etc. The jurisdictional boundaries of the MPO encompass the current urbanized area (established in the aforementioned agreement between the MPO and Governor) and the area that is expected to be urbanized during a 20-year forecast period.

By comparison, TxDOT's responsibilities entail the "state" roadway network, which is commonly referred to as the "state system." Specific examples of this network (and respective designations) include the interstate system (IH), United States highways (US), state highways (SH), farm-to-market roads (FM), as well as spurs (SP) and loops (LP). These facilities are critically important, as they represent the primary sources of roadway capacity and mobility throughout the state. As such, these facilities will commonly be a focal point of attention for a proposed/planned inland port-type development.

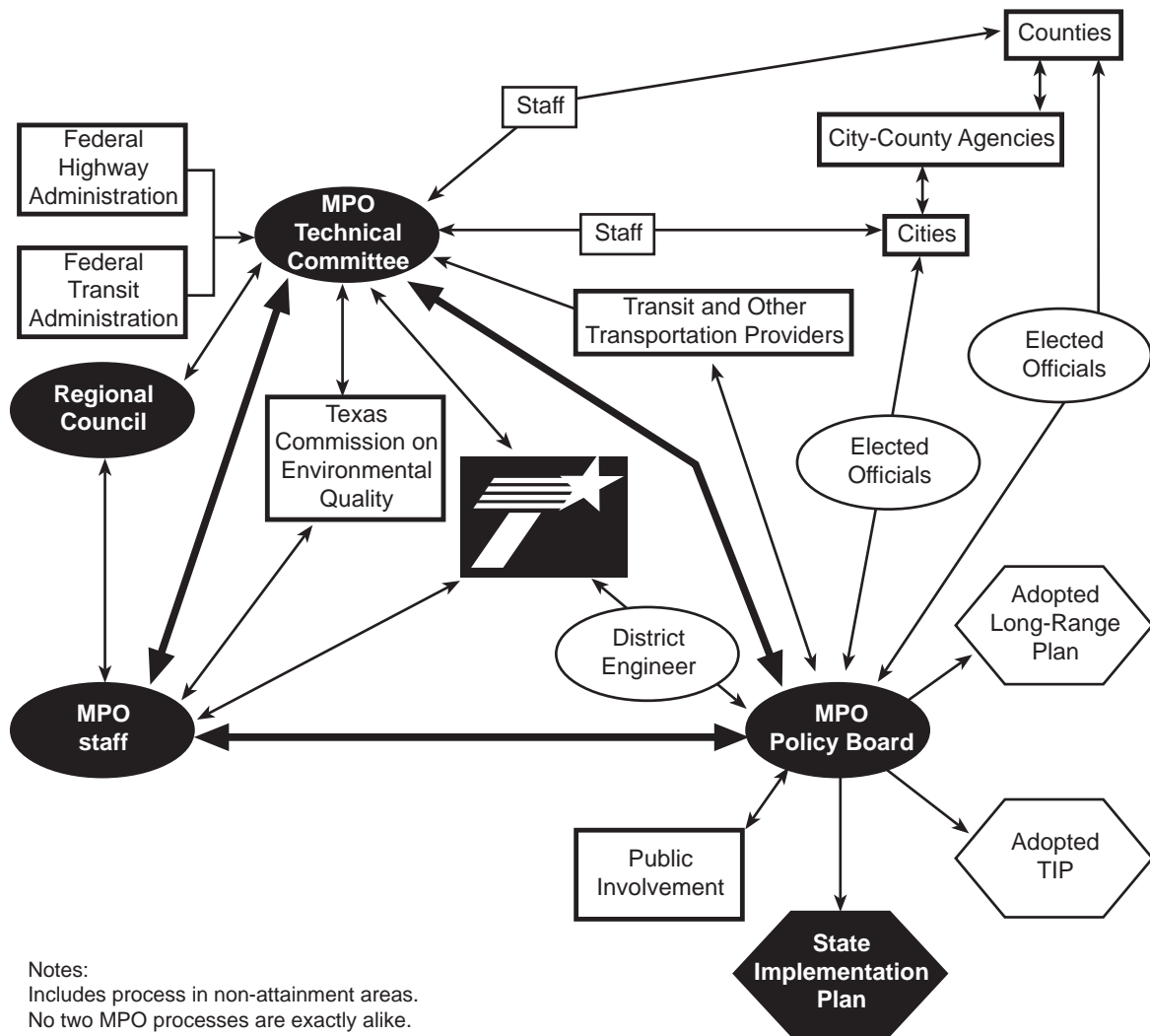


Figure 2.1 Participants in Planning Process

Requests made by inland port developers to TxDOT facilities would typically include the expansion of existing state roadway(s) or the construction of a new roadway in the vicinity of the proposed development site. When such requests are made, the process illustrated in Figure 2.2 must be recognized and followed. As noted previously, this process entails two major phases termed “planning” and “programming.” The former phase consists of activities during the 10 to 20-year timeframe when projects are considered to be in the initial stages of development. This project status is reserved for projects with high capital costs where the route studies, environmental impacts, and right-of-way determinations can take a substantial amount of time.

The “programming” phase is characterized by the Unified Transportation Program (UTP), which is essentially the state’s 10-year financial plan for transportation projects. The UTP is used by the Texas Transportation Commission (Commission) and TxDOT to guide and track proposed projects through more detailed development and on to construction. The UTP has two basic stages termed “design” and “schedule.”

The information outlined previously is only a broad overview of the PDP and its current status. Interested parties are encouraged to visit the TxDOT website or contact their regional

TxDOT District Office for more detailed information. As noted earlier, this process is in a state of change, but the fundamental purpose of the process remains the same. This process is necessary to maintain a fair, fiscally responsible program, and is particularly important given the present fiscally strained conditions of the state. It is also worth noting that this program funds not only new construction and expansion of state roadways, but also their rehabilitation and maintenance.

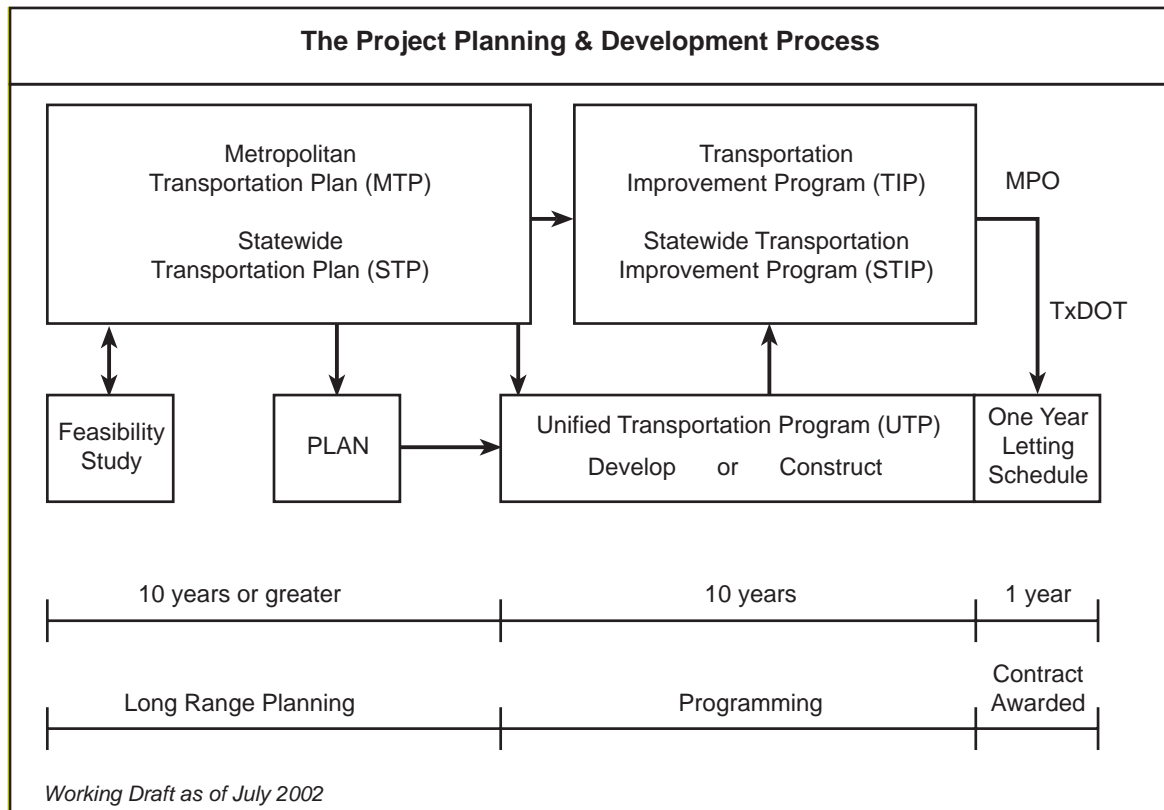


Figure 2.2 TxDOT Project Development Process

Based on the aforementioned processes, developers/planners of inland ports are encouraged to become familiar with the noted items. While it is not necessary to know the entire process in complete detail, it is vitally important that those proposing inland port highway connections understand that this is a legally-established process, which TxDOT planners will use to evaluate such projects, as well as their relative competitiveness with other prospective projects throughout the region and state. There are a number of ways that inland port proponents can increase the success of their prospective projects, – including: 1) a good basic understanding of the TxDOT PDP; 2) providing material/information related to the inland port (refer to Figure 3.1) in a timely fashion; 3) assisting in gathering information necessary for TxDOT planners to include the prospective inland port project’s needs in the PDP; 4) providing (i.e., paying for or donating) right-of-way needed for the project; and 5) entering into or creating joint partnerships that provide partial funding for the roadway construction/enhancements being requested.

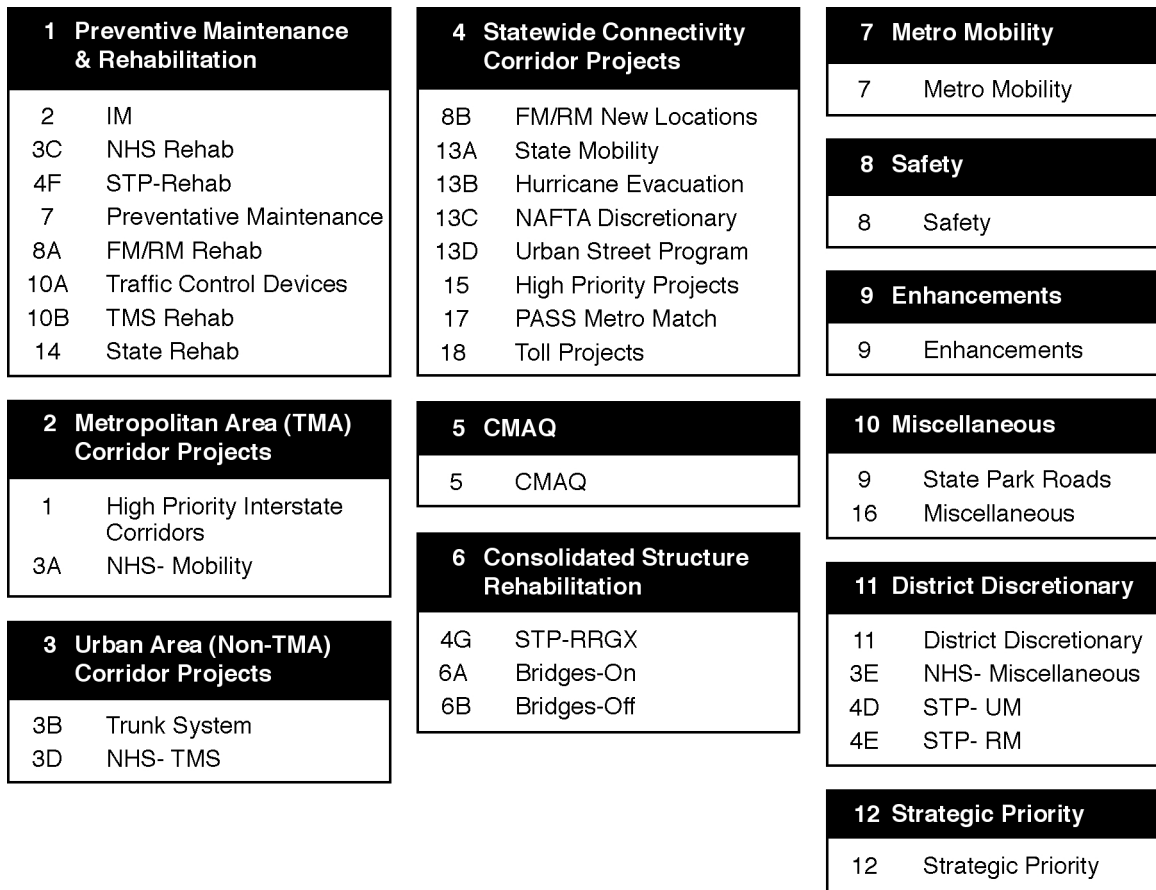


Figure 2.3 New Funding Category Structure (Draft as of July 2002)

### 3. Inland Port Classification

#### Background

Researchers on study 0-4083 noted the difficulty in classifying the wide variety of inland ports identified throughout the world. However, it was quite evident that the ports changed as they grew and these changes profoundly affected the needs for transportation links. In some cases, inland port proposals were merely conceptual and, though perhaps having a sound intellectual basis, had not moved to a stage where they could be regarded as valid transportation centers. At the other extreme, some ports were variations of long-established modal sites such as those on rivers and land borders. The challenge to the researchers was categorizing these sites for insertion into the transportation planning process. Researchers finally decided on a modified “product lifecycle,” which is used frequently in business and marketing analyses. The idea is that over the lifetime of a site, there is a result (like traffic demand), which grows somewhat slowly at first and then, if the site is successful, grows vigorously into a more stable process. The resulting relationship is asymptotic in nature and neatly falls into a number of phases.

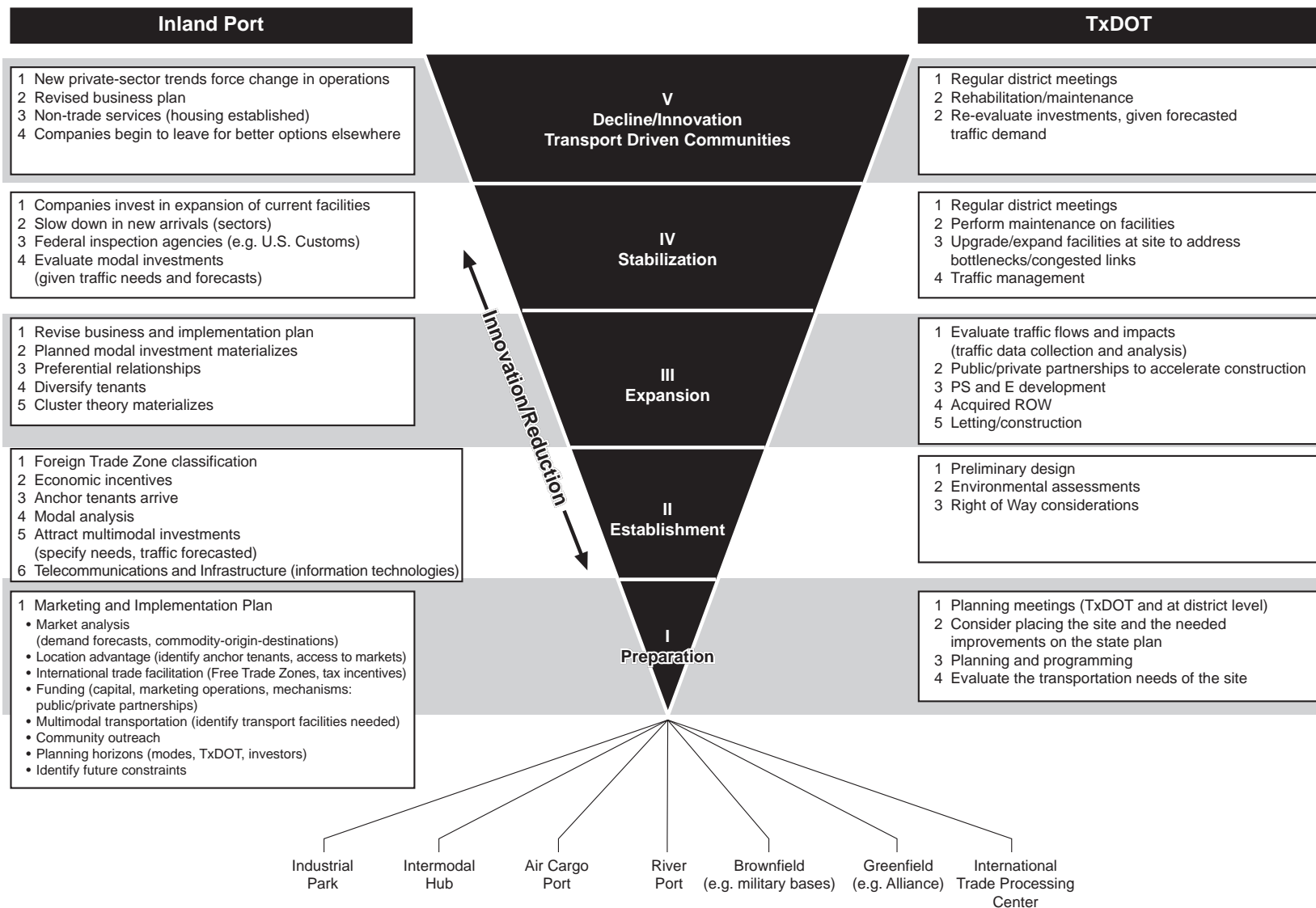


Figure 3.1 Inland Port Lifecycle

The life cycle approach, from TxDOT's perspective, should focus on the impact that the inland port site activities will have on the highway network. If the result is truck trips generated from the site, traffic levels will be relatively low when a site is newly opened. As the site develops, traffic will grow at some point in time when there is a thriving transportation system (usually multi-modal), generating a variety of trips that will impact both local and regional highway networks. The general development of the life cycle of an inland port can be described using the following five stages:

- a. Preparation
- b. Establishment
- c. Expansion
- d. Stabilization
- e. Decline/Innovation

Interestingly, the life cycle relationship may also reflect other measures of success that sponsors are seeking, such as employment, profit, and an enhanced tax base. However, this guide focuses on the aspect of traffic, since this is the main responsibility of TxDOT.

The development life cycle can be viewed both as a planning tool for inland port proponents and an evaluation tool for transportation planners. In their consideration of inland ports, transportation planners will work at each stage to support the site proposal and ensure that the appropriate investment is being made at the state level. The following sections identify the five stages of inland port development and the key elements that are expected from the proponents or supporters of the facility, together with potential responses from the transportation planners at TxDOT district and central headquarters.

## **A. Preparation**

This section deals with the first stage of inland port development, namely taking a proposal or concept and making it operational even though its scale may be modest. This development time can be quite lengthy, although at times the proposal concepts for inland ports are stimulated through the availability of property that has been de-commissioned from the US military forces. It is at this point—the development stage—that it is critically important to establish the ground work for a meaningful and effective relationship between those proposing the inland port and the TxDOT planning officials who will deal with those elements related to the highway links and networks. In general, ideas or suggestions for an inland port do not come from transportation experts. They come from those in the community who are concerned about employment prospects, growing the tax base, or providing areas for attracting industries and business activities. For those unfamiliar with the TxDOT project development process (PDP) it is vitally important that time is taken to understand the process, and therefore comprehend the constraints and legal systems by which TxDOT is expected to undertake project developments.

Figure 3.2 lists issues that the proponents of inland ports should be prepared to discuss with the TxDOT district planning staff. Most essential is a well-organized, convincing business plan. This plan must touch on the commodities to be moved, industries to be attracted, and generally lay out a convincing plan that these inland ports are likely to be a trip generator that will impact the TxDOT system in the future.

In addition, any information that can be provided about users who have committed to the center and their traffic needs (including basic traffic forecasts), would be extremely helpful in supporting the case in the state planning process. It is important that proponents recognize the substantial shortage of funds for transportation investments. TxDOT does not possess an unlimited budget for such investments and has to apply strict economic evaluations to promote

those projects most likely to succeed. Therefore, proponents should provide convincing evidence of the financial strength of the proposal, what they consider to be the impact on transportation in general (and highways in particular), and finally recommend specific highway project needs. This is essential since it will identify and flag those projects that will best suit the facility and to which TxDOT can apply their planning evaluation process.

TxDOT officials will likely begin the process by recommending a series of planning meetings at the district level with the proponents of the project and the relevant planning staff. If proponents are already familiar with the process (as recommended in this guide), then there should be a harmonious meeting and understanding of what will ultimately drive a project and accelerate it to success. District planning staff have substantial autonomy but may recommend further TxDOT planning meetings, perhaps with departmental staff such as those at the TxDOT multi-modal office. Once the project has been identified and found acceptable by the district planning staff it may proceed into the needs identification stage where need and scope will be defined. Following that, the project will be considered within the district and, if accepted, will proceed to project authorization which will trigger a series of steps in the PDP process, as previously discussed. Once an inland port becomes operational, managers at the site will become more familiar with TxDOT needs and the process. In fact, the more mature the inland port becomes, the less work there is to be done since both parties are intimately aware of each other's needs. This relationship is not clearly established in the first two phases of inland port development and exemplifies another reason why it is critical for those proposing new sites to have a clear and well argued case for TxDOT involvement.

Inland Port	TxDOT
<p>1 Marketing and Implementation Plan</p> <ul style="list-style-type: none"> <li>• Market analysis (demand forecasts, commodity-origin-destinations)</li> <li>• Location advantage (identify anchor tenants, access to markets)</li> <li>• International trade facilitation (Free Trade Zones, tax incentives)</li> <li>• Funding (capital, marketing operations, mechanisms: public/private partnerships)</li> <li>• Multimodal transportation (identify transport facilities needed)</li> <li>• Community outreach</li> <li>• Planning horizons (modes, TxDOT, investors)</li> <li>• Identify future constraints</li> </ul>	<ol style="list-style-type: none"> <li>1 Planning meetings (TxDOT and at district level)</li> <li>2 Consider placing the site and the needed improvements on the state plan</li> <li>3 Planning and programming</li> <li>4 Evaluate the transportation needs of the site</li> </ol>

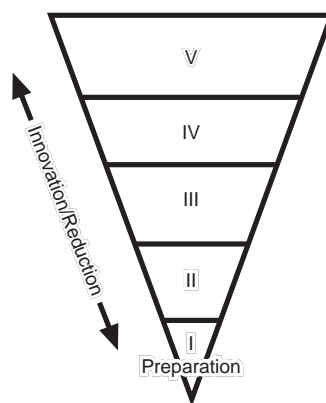


Figure 3.2 Stage One – Preparation

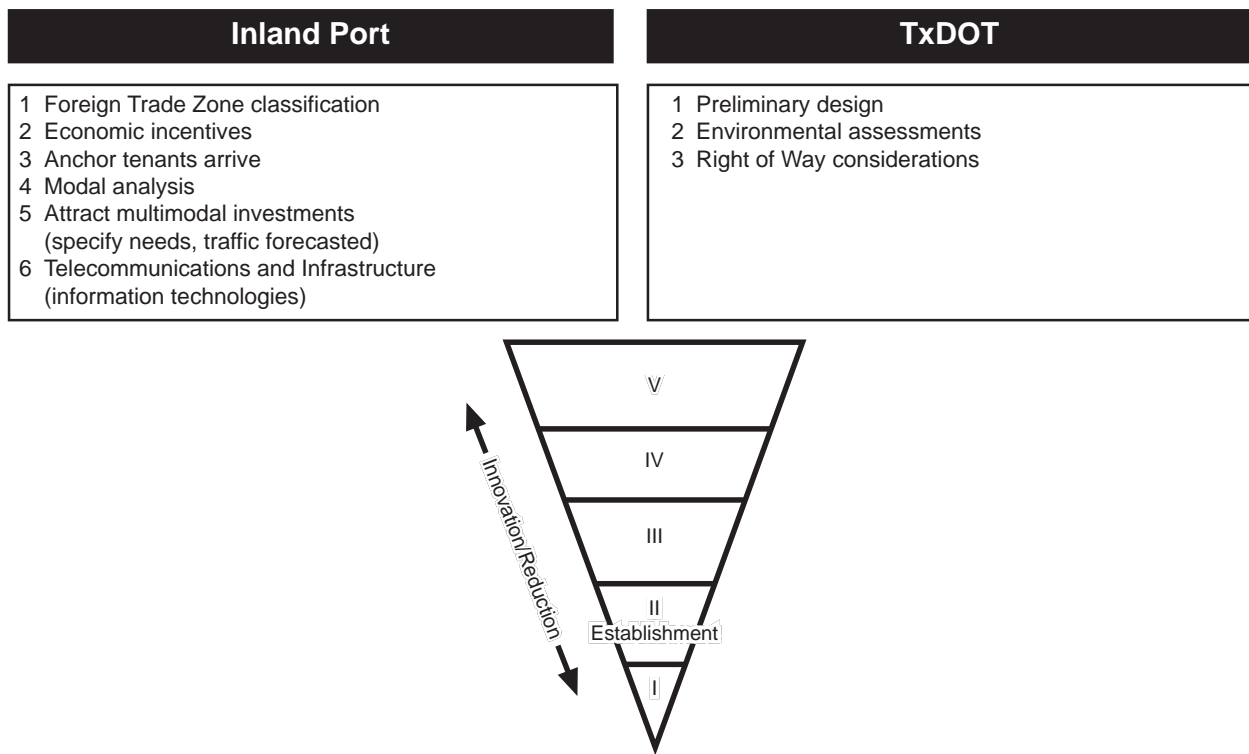


**B. Establishment**

The next stage begins when an inland port is operational and one or two anchor tenants have been established on the site. These tenants are likely to have certain transportation needs, which may best be provided by highways. Figure 3.3 lists the elements that would make the best case for those proposing to strengthen the transportation capabilities of a new site and TxDOT’s reactions. Again, a well-argued case must be made covering a range of issues.

It is critical to establish the market size, which the inland port will serve and ways the site will interact with multiple transportation modes. If the inland port still relies mainly on one mode, its growth is likely to be limited. Careful analysis of the land available at the site is important since this can be a critical constraint in port development. Financial issues need to be examined, such as tax and local incentives, the likely impact in terms of the employment base, and any likelihood in partnering where the private sector can complement investments made by TxDOT as the project moves towards implementation.

Finally the team making the submission to TxDOT must be specific about the highway project needs, the demand on the investments requested, and be able to demonstrate how these fit into the regional transportation network. TxDOT’s involvement in stage two inland port activities can be very extensive and may require substantial commitments at both district and



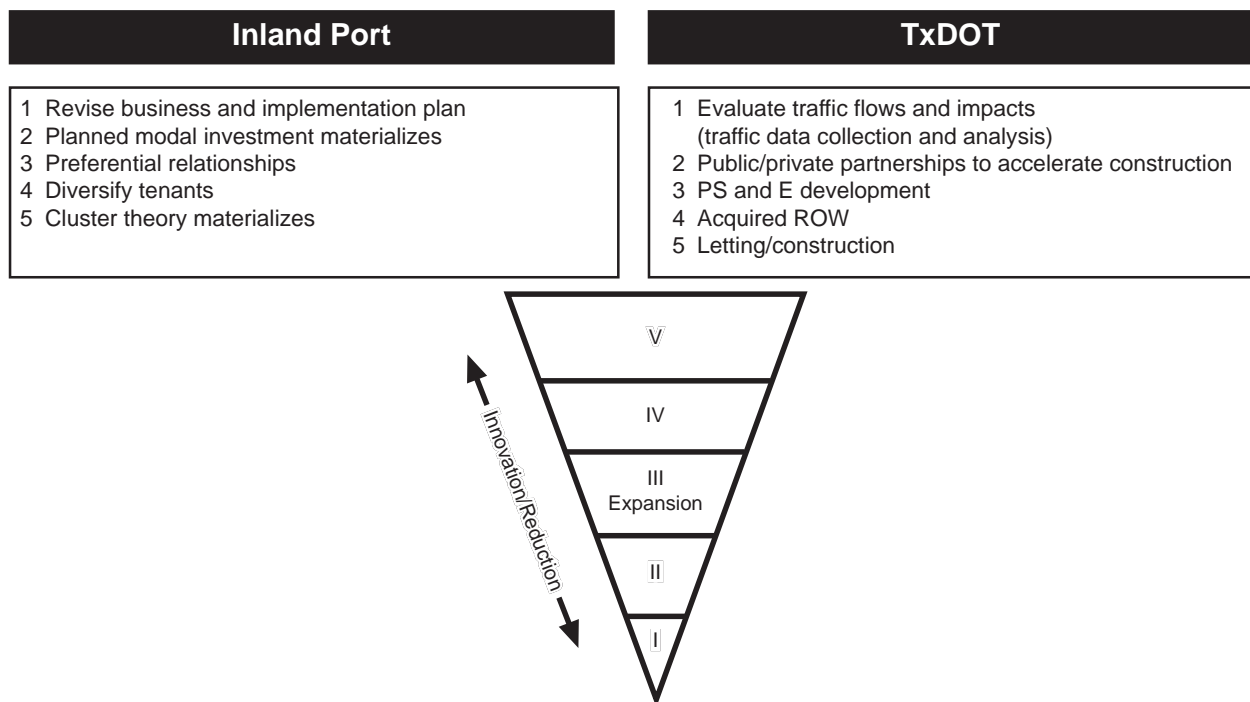
*Figure 3.3 Stage Two – Establishment*

division levels. Once TxDOT initiates the project, it begins to move through the process described in section two and shown in the flow chart of Appendix A in this guide. TxDOT staff will evaluate any project needs that may be multi-modal in nature, thus ensuring that TxDOT’s activities planned in this regard are not being compromised. The TxDOT district staff will then begin a series of meetings to discuss the various stages of the proposals, including material

developed by TxDOT staff themselves and consultants that TxDOT might hire to examine particular aspects of the project. Included in this process is the undertaking of data collection. Proponents of inland port projects can make TxDOT’s job easier by thinking through the consequences of their proposed activities in terms of traffic generation and developing forecasts that can be used by TxDOT in the evaluation process. A successful relationship cultivated at this stage of inland port development will ensure that a harmonious relationship is maintained in later stages and supports the most effective planning process.

**C. Expansion**

Those supporting expansion of an existing inland port are expected to provide a substantial commitment in the form of documentary evidence and data to expedite the proposed project (see Figure 3.4). It is reasonable to expect a multi-year business plan that includes an indication of the accuracy of preliminary forecasting as indicated in previous business plans. An inland port expansion could include new modal elements, since they are cornerstones of port expansion. A wider range of key tenants would make a more convincing case for growth on the highway mode. Work undertaken by researchers has indicated that as anchor tenants grow, they attract related businesses that feed into their assembly and production processes.



*Figure 3.4 Stage Three – Expansion*

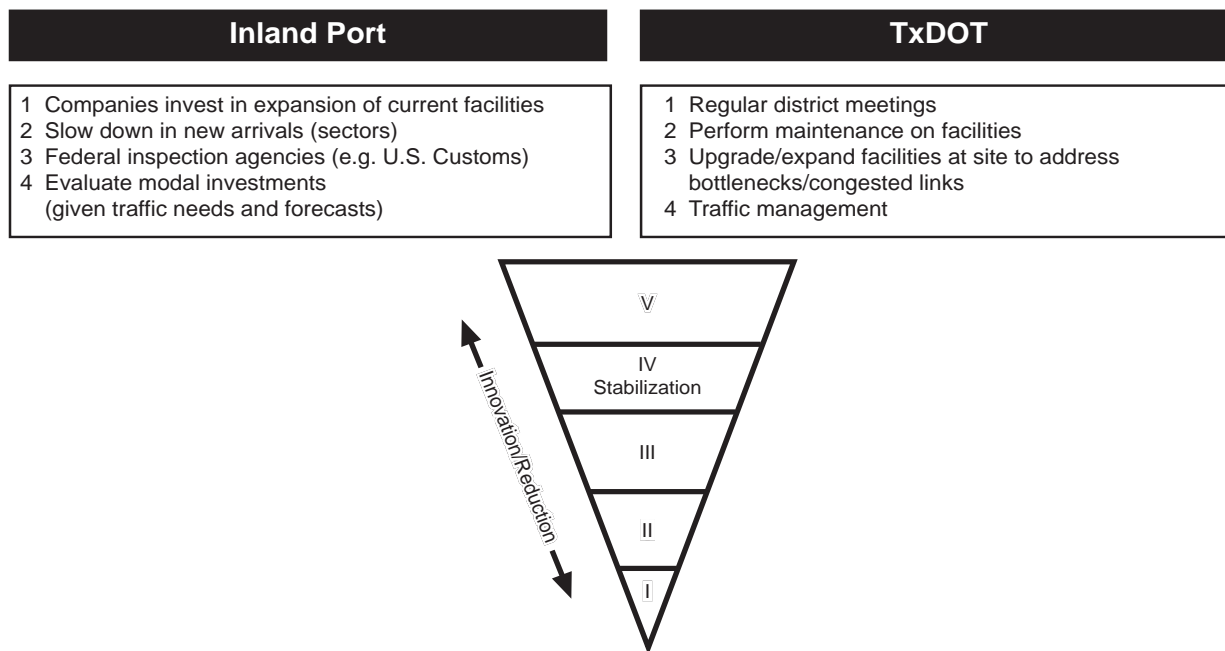
These so-called “cluster” activities provide new growth opportunities that can result in additional trips on the related highway systems. During an expansion mode, proponents may expect an accelerated schedule from TxDOT, particularly if they consider partnering with TxDOT to accelerate the PDP. This partnering can take various forms ranging from land acquisitions for right of way, data collection for evaluation, and the donation of resources for

construction. Ultimately, detailed traffic forecasts will be needed for any proposed highway project recommended at this stage.

TxDOT will begin to consider the impact of the larger site on statewide and district transportation planning. At the district level, planners will evaluate the impacts of flows on the local highway networks and compare them with other traffic generating points in the system. This is a precursor to undertaking formal cost benefit analysis to ensure that the resources are being placed in the most appropriate locations on the system. To facilitate an understanding of traffic demand, TxDOT will undertake traffic data collection and analysis, which could be accelerated if the proponents provided this information. TxDOT would also evaluate the impact of any joint partnering proposed and suggest how such partnering could target those elements most critical to accelerating the process. Finally, there would be an evaluation of the current structure and maintenance progress at the district level to ensure that any proposed highway project related to growth in an inland port would not adversely impact either construction or maintenance commitments already made.

#### **D. Stabilization**

The stabilization stage begins when the inland port is firmly established and the relationship between the managers and TxDOT district staff is well understood. At this level, it is probable that demands on the highway system are unlikely to be substantial and may be focused on certain congestion linkages, thereby improving safety and other elements of the local network. Again the proponents should be prepared to discuss the business plan with TxDOT, which would allow planners to make a convincing case for such investments (Figure 3.5). The business plan might include problems that current tenants are experiencing regarding traffic flow and the resolution of these problems will be linked to the projects recommended at this stage. However, it remains critical that a convincing case is made to TxDOT, which demonstrates that the removal of these bottlenecks and other transportation problems on the highway system will be long term and will provide a substantial benefit to the local community. At this time it is expected that the proponents are fully aware of TxDOT's needs and requirements and will be able to estimate future needs on the highway links associated with their sites. When new highway needs are identified, proponents will likely recognize the need to give trip generation data and share developmental undertakings that the site is considering with TxDOT.



*Figure 3.5 Stage Four – Stabilization*

TxDOT staff is likely to institute regular meetings at the district level to ensure that requested elements are placed in the appropriate planning level. It will be important that planners feed traffic data into the regional network and that they are made aware of the efficiencies to be gained by any project that is related to the inland port. Staff will enter projects—once approved—into the PDP and be able to identify with proponents how these might be accelerated. Finally, it will evaluate the needs of routine maintenance and traffic management associated with highway systems that are used by the facilities.

**E. Decline/Innovation**

If we use the life cycle concept in the planning classification system for inland ports, at some point it is likely that the inland port will be overtaken by other new and more efficient ways of manufacturing or distributing products to regional and global markets (Figure 3.6). In these situations it is probable that the local supporters of the system, perhaps the Chamber of Commerce, will consider ways in which the site may be revitalized. It should be expected that the proponents will present TxDOT with a business plan identifying how they intend to carry out improvements to the facility and the likely traffic forecasts and needs associated with this program. The business plan should be multi-year and should be structured in a way that clearly fits into the planning process already described. Convincing evidence should be offered in terms of the new business initiatives, together with any financial incentives that have been committed to the site. It may also be possible to revitalize a site through new opportunities for expansion and these opportunities should be clearly described along with the impact to the local system.

For example, if inland port management is working to develop low cost housing for its logistics staff near the inland port site, it is important to put the resulting traffic demands into the PDP process. The proponents should provide TxDOT staff with traffic data—both current and forecasted—from the facility that relate to the proposed transportation project, thus providing

forecasted—from the facility that relate to the proposed transportation project, thus providing information on exactly which new highway projects fit into the inland port sites so that TxDOT may consider this in the planning context.

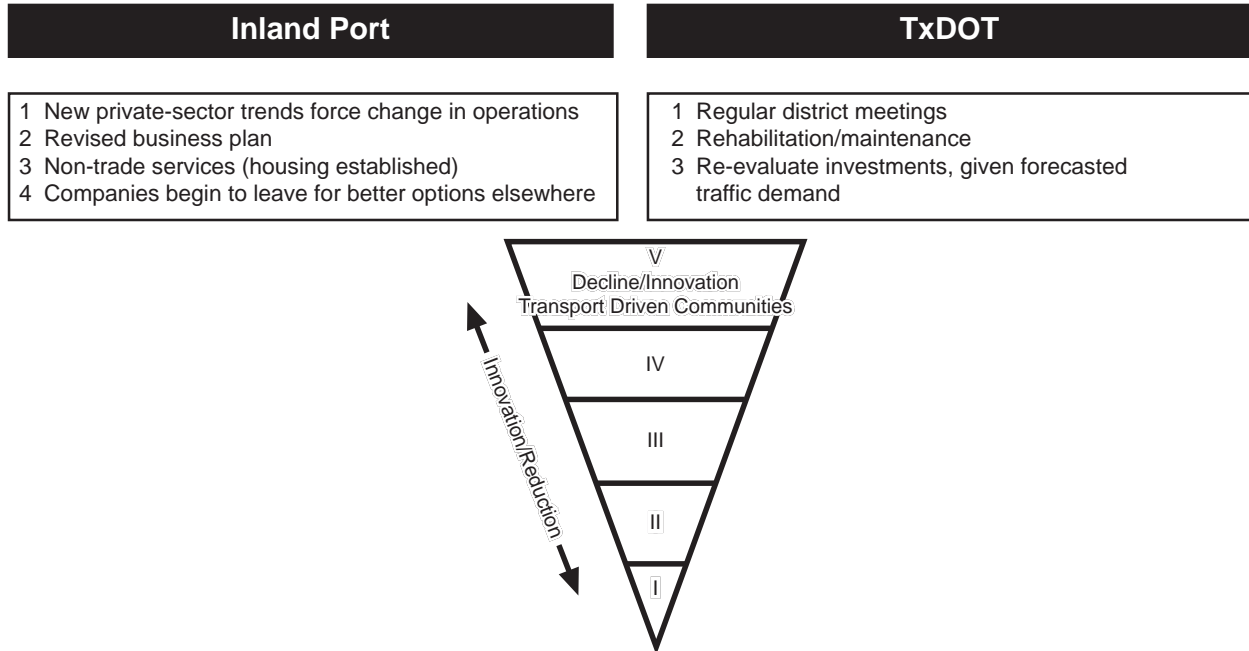


Figure 3.6 Stage Five – Decline/Innovation

TxDOT will input this information into district planning and projects and, when authorized, into the PDP. District staff will involve the departmental multi-modal office if new modes are involved.

#### 4. Summary

This guide shows those responsible for promoting inland ports how best to interact with TxDOT district planning staff. It is recommended that TxDOT planners meeting with supporters of inland port projects read the evaluation chapter of study 4083-2 to develop relevant questions to guide the discussions and aid the planning process. Since inland ports are highly variable in design, the guide recommends that proponents consider only those *transportation* needs associated with an inland port and how such needs impact the local and regional *highway* systems. It must be remembered that, although TxDOT works closely with other modal providers (like railroads), it is not responsible for infrastructure investments in these modes and is essentially focused on the provision and maintenance of highways. Those expecting planning assistance from TxDOT must therefore constrain their interests to highways. It is immensely helpful if they provide traffic data to support the project they are proposing. It must be remembered that traffic needs in Texas far outweigh the investment funds at the state’s disposal, so all planning problems involve choice. Proponents who present the best-case have a better likelihood of success and may even be able to accelerate the planning process.



## **APPENDIX**

# PROJECT DEVELOPMENT PROCESS

