Background Paper

GULF COAST RAIL DISTRICT WORKSHOP
COMMUTER RAIL RIGHT-OF-WAY

NOVEMBER 2013

Prepared for

GULF COAST RAIL DISTRICT

Prepared by

TEXAS A&M TRANSPORTATION INSTITUTE
THE TEXAS A&M UNIVERSITY SYSTEM

TABLE OF CONTENTS

Introduction and Purpose

Since its inception, Houston has prospered because of its rail network. As the freeway system reaches capacity, the Houston-Galveston region is again looking to both freight and commuter rail to foster economic growth and travel alternatives (see Figure 1 and Figure 2).

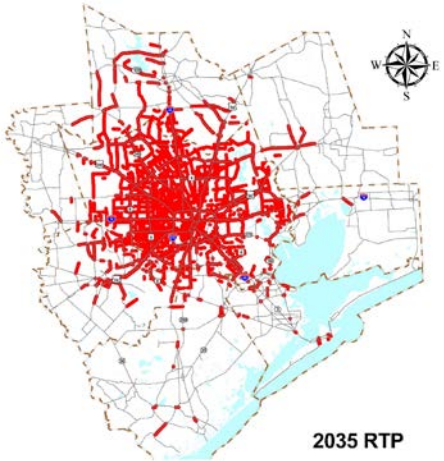

FIGURE 1. 2035 CONGESTION, REGIONAL TRANSPORTATION PLAN (H-GAC)

The Gulf Coast Rail District (GCRD) works with public and private partners to develop and implement a systematic approach to improving the regional rail network for the benefit of the region's residents and the economy. GCRD would like to investigate the opportunity and feasibility of using rights-of-way (ROWs) to develop commuter rail in the region. The concept is to have separate track for freight and commuter rail in separate or shared ROW corridors. GCRD is hosting a workshop November 15, 2013, to explore the feasibility of shared public and private ROW to accommodate both types of rail in the same corridor. The focus of the workshop is not traditional shared use of rail tracks between commuter and freight operations, although this may still be feasible in some limited areas in the Houston-Galveston region.

FIGURE 2. HOUSTON FREEWAY CAPACITY CONTRAINT AREAS (H-GAC)

What to Expect in the Workshop

The workshop agenda will include brief introductions, a quick review of the potential corridors for commuter rail service in the region, and then a discussion about ROW in potential corridors. Facilitators will use GoogleEarth Pro and City of Houston GIMS tools to zoom in on aerial imagery and pan across each potential corridor (see Figure 3). Workshop participants will contribute to the discussion about ROW ownership and space for commuter rail. The workshop is essentially the first filter in the decision making process as the region takes a fresh look at commuter rail and focuses on ROW rather than traditional shared track operations.

FIGURE 3. EXAMPLE OF GOOGLEEARTH AERIAL IMAGERY

The question of the day will be: "**Which corridors, if any, have ROW potential for commuter rail service and therefore warrant further feasibility analysis?**"

History of Regional Commuter Rail Studies

The following timeline briefly summarizes the history of commuter rail planning processes in the Houston-Galveston region over the past 25 years.

1988-1992 (sponsor: Houston METRO)
Track-Sharing Study by METRO investigated potential for two scenarios:

- service along 9 of 13 potential rail lines, or
- start-up service on 4 of 13 lines.

1998 (sponsor: METRO)
METRO revises ridership and cost forecasts for six lines of commuter rail into downtown. Track congestion and costs determined prohibitive.

1999 (sponsor: TxDOT)
US 290 Corridor Major Investment Study of US 290 and portions of SH 249 determined locally preferred alternative to include general purpose lanes, managed facility, and high-capacity transit along Hempstead Highway.

2003 (sponsor: Harris County)
Harris County Commuter Rail Analysis evaluated potential for commuter rail operations along three corridors: US 290, SH 249, and US 90A. Evaluated physical, operational, and relative cost characteristics.

2004 (sponsor: Harris County)
Harris County Freight Rail Grade Crossings Study evaluated mobility and safety for train and vehicular traffic at rail grade crossings.

2004 (sponsor: H-GAC)
U.S. 90A Rail Feasibility Study studied future transportation needs and feasibility of implementing passenger rail in US 90A corridor.

2005 (sponsors: multiple)
Regional Freight Rail Improvement Plan developed information about seven projects totaling $4.5 billion to improve services for city, private industry, and seaport.

[GCRD formed in 2007]

2007 (sponsor: H-GAC)
Commuter Rail Corridor Relative Demand Potential summarized the data, procedures, and measures to estimate relative demand among 16 potential commuter rail corridors.

2008 (sponsor: H-GAC)
Regional Commuter Rail Connectivity Study identified recommendations and findings for the region to consider in furthering commuter rail planning, engineering, and facility and infrastructure preparation: looked closely at 10 corridors as principal corridors and five corridors as the

2010 (sponsors: City of Galveston, Galveston County)
Galveston-Houston Mobility Corridor Alternatives Analysis examined feasibility along IH 45 and SH 3.

2012 (sponsor: METRO)
US 90A Southwest Commuter Rail Corridor Project examined feasibility along or near US 90A and Union Pacific Railroad (UPRR).

2012 (sponsor: GCRD)
Hempstead Corridor Commuter Rail Study examined feasibility along the UPRR parallel to US 290.

Primary Types of Commuter Rail

According to the Federal Railroad Administration (FRA), there are separate definitions for the terms shared track, shared ROW, and shared corridor for freight and commuter rail service.

Shared Track

Shared track is when the freight and commuter rail operations use the same physical track. Increases in freight rail demand in the future mean that operating freight and commuter service on shared track will be difficult and may be feasible in limited applications in this region.

Shared ROW

Shared ROW is when vehicles run on separate tracks less than 25 feet apart—which according to the FRA makes the tracks adjacent and subject to increased FRA regulation.

Shared Corridor

Shared corridor is when commuter rail and freight operators share a corridor in which tracks for freight and commuter services are 25 to 200 feet apart. A common, preferred separation is 50 feet from center to center. Another feature common to shared corridor commuter rail service is a pedestrian safety barrier between the commuter track and freight tracks.

Figure 4 depicts shared corridor between double freight tracks (left) and barrier-separated commuter track (source: 2008 H-GAC CRC Study).

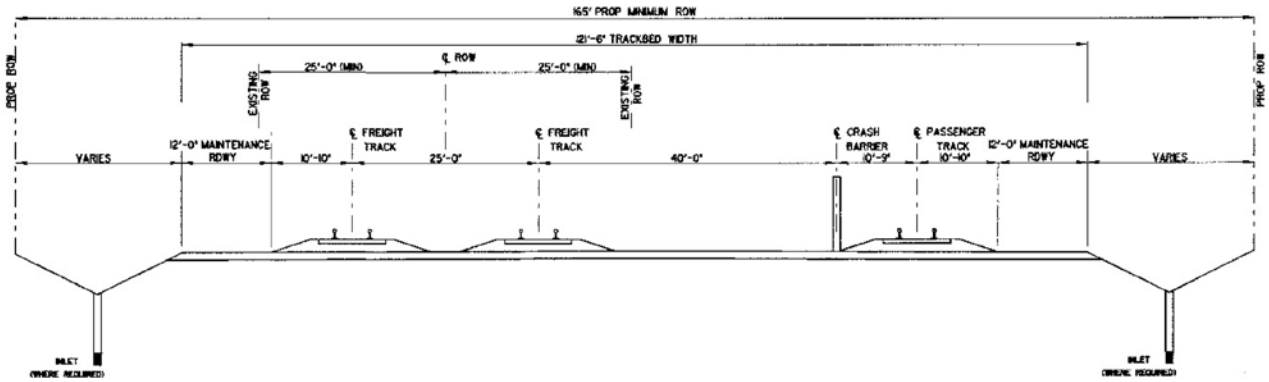

FIGURE 4. SHARED CORRIDOR RAIL CONFIGURATION WITH BARRIER

Examples of Shared Corridor

Shared track and shared ROW are the most common types of commuter rail service in the United States and Canada. However, examples of shared corridor commuter rail currently in operation do exist; a few examples are below. Please note that these examples may include commuter rail alignments where a portion of a rail alignment is shared corridor and sections of the corridor fall into the shared ROW category (track separation less than 25 feet).

FrontRunner in Utah

The Utah Transit Authority (UTA) began operating the FrontRunner commuter rail line in 2008. FrontRunner is a push/pull diesel train with either single or bi-level vehicles, connecting 16 stations through 44 miles of track. FrontRunner operates on separate track in either shared corridor or shared ROW with freight operator UPRR. Generally, the northern half of the corridor is shared ROW with tracks separated by 20 feet, and the southern half is shared corridor with tracks separated by 35 feet. UPRR originally owned the entire corridor, but UTA purchased some of the ROW parallel to the corridor. The partner agencies negotiated insurance and liability coverage for the line as part of the original contract. UPRR trains cross FrontRunner tracks in a few places to access adjacent industrial sites and so require special considerations for scheduling with FrontRunner. Otherwise, the two services are able to operate independently from each other.

GO Transit in Toronto

GO Transit began building self-owned track in 1988 to expand on the system it was using in Canadian National Railway and Canadian Pacific Railway ROW. The agency owns outright part of the ROW on which it operates a mixture of shared ROW and shared corridor commuter rail services.

Metro Subway in Baltimore

The Metro Subway is a transit service operated by the Maryland Mass Transit Administration in Baltimore, with 7.2 miles of track sharing a corridor with CSX Hanover. The heavy rail line is 15.5 miles long serving 14 stations. The Metro Subway line runs either underground or at surface level, where it shares a corridor with CSX Hanover before moving to an elevated structure. The portion of shared corridor runs parallel to the freight rail track at a distance of 50 to 100 feet from the rail line. There are no grade crossings between the freight line and the heavy rail line.

Rail Runner Express in Albuquerque/Santa Fe

Rio Metro operates the Rail Runner Express commuter rail train, which connects the Albuquerque and Santa Fe areas. The first phase of the service, located in Albuquerque, is shared track with Amtrak and Burlington Northern Santa Fe Railroad (BNSF). In 2008, Rio Metro

began the northward expansion to Santa Fe through the purchase and construction of new tracks. An 18-mile segment of track is shared ROW with IH 25 but is not adjacent to the freight track. The tracks run underneath interstate overpasses and along the median of the interstate. The New Mexico Department of Transportation owns the track and ROW. Track spacing meets BNSF standards. In addition, the height and width of tunnels comply with FRA engineering standards. The entry to the median of the highway occurs between a rest area and an overpass of the road. The platforms to stations in the middle of the highway median, such as the Santa Fe County/NM 599 Station, are reachable by pedestrian overpasses. Fencing discourages pedestrians from accessing the platform via the highway or trying to leave the overpass inappropriately. Figure 5 is a photograph of a Rail Runner Express commuter train operating down the median of IH 25.

FIGURE 5. RAIL RUNNER EXPRESS COMMUTER RAIL IN SHARED CORRIDOR WITH IH 25

RIGHT-OF-WAY FOR COMMUTER RAIL

The Houston-Galveston region has studied potential commuter rail corridors numerous times, as highlighted in the timeline on page 2 of this background paper. The purpose of this section is to provide a brief synthesis of the corridors previously considered and how they rank for potential demand as compared to each other. The information in this section of the background paper is from the executive summary of the H-GAC 2008 Regional Commuter Rail Connectivity Study, available at http://www.hgaccommuterrail.com/.

WHY LOOK AT PREVIOUS STUDIES?

This summary information about potential corridors in the region is provided as historical background. The workshop will focus on the discussion about potential ROW available in each corridor previously studied to answer the question: "Which corridors, if any, have ROW potential for commuter rail service and therefore warrant further feasibility analysis?"

POTENTIAL CORRIDORS IN PREVIOUS STUDIES

In 2008, H-GAC planners and a consultant team evaluated 16 potential commuter rail corridors in the region (see Table 1). They used ranking criteria to rate each corridor for demand or potential utilization in terms of demographics, trip generation, and trip intensity. Figure 6 illustrates a corridor map surrounded by tables summarizing the H-GAC rankings for each corridor. Both the corridors and surrounding tables are color-coded by group category.

TABLE 1. CORRIDOR DESCRIPTION, LENGTH AND OWNERSHIP (H-GAC)

Corridor	Corridor Name	Length (mi.)	Railroad Ownership
C01	N, IH-45	49.1	HBT and UP
C02	NNE, US 59	43.7	UP
C03	NE, Btw. US 59 & US 90	52.7	HBT and UP
C04	ENE, US 90	56.9	UP
C05	E, IH-10	33.1	PTRA and UP
C06	ESE, SH 225/SH 146	50.6	UP and abandoned
C07	SE, IH-45	43.2	GHH and UP
C08	SSE, SH 35/SH 6	49.0	BNSF, GHH, and UP
C09	S, SH 288/FM 521	55.4	HBT, UP, abandoned, and "new"
C10	WSW, US 90A/US 59	42.9	HBT, UP, and TM
C11	W, FM 1093 (Westpark)	34.1	Abandoned
C12	W, IH-10	35.3	UP and abandoned
C13	WNW, US 290	53.1	UP
C14	NNW, SH 249/FM 1486	59.0	BNSF and HBT
C15	SW, FM 521/1994/442	44.4	BNSF, HBT, UP, and abandoned
C16	E2, IH-10	57.4	PRTA and "new"

BNSF BNSF Railway Company
UP Union Pacific Railroad
HBT Houston Belt & Terminal
(Corporate shell for the "Terminal Trackage" owned 50/50 by BNSF & UP. Maintenance performed by UP. Operations controlled by the Joint Dispatching Center in the UP Regional Office building in Spring, TX.)
PTRA Port Terminal Railroad Association
(General property ownership resides with Port of Houston. PTRA Operating Board of Directors consists of representatives from the Port of Houston, BNSF, UP, & KCS.)
GHH Galveston Houston & Henderson
(UP property)
TM Texas Mexican
(Part of KCS Railroad)

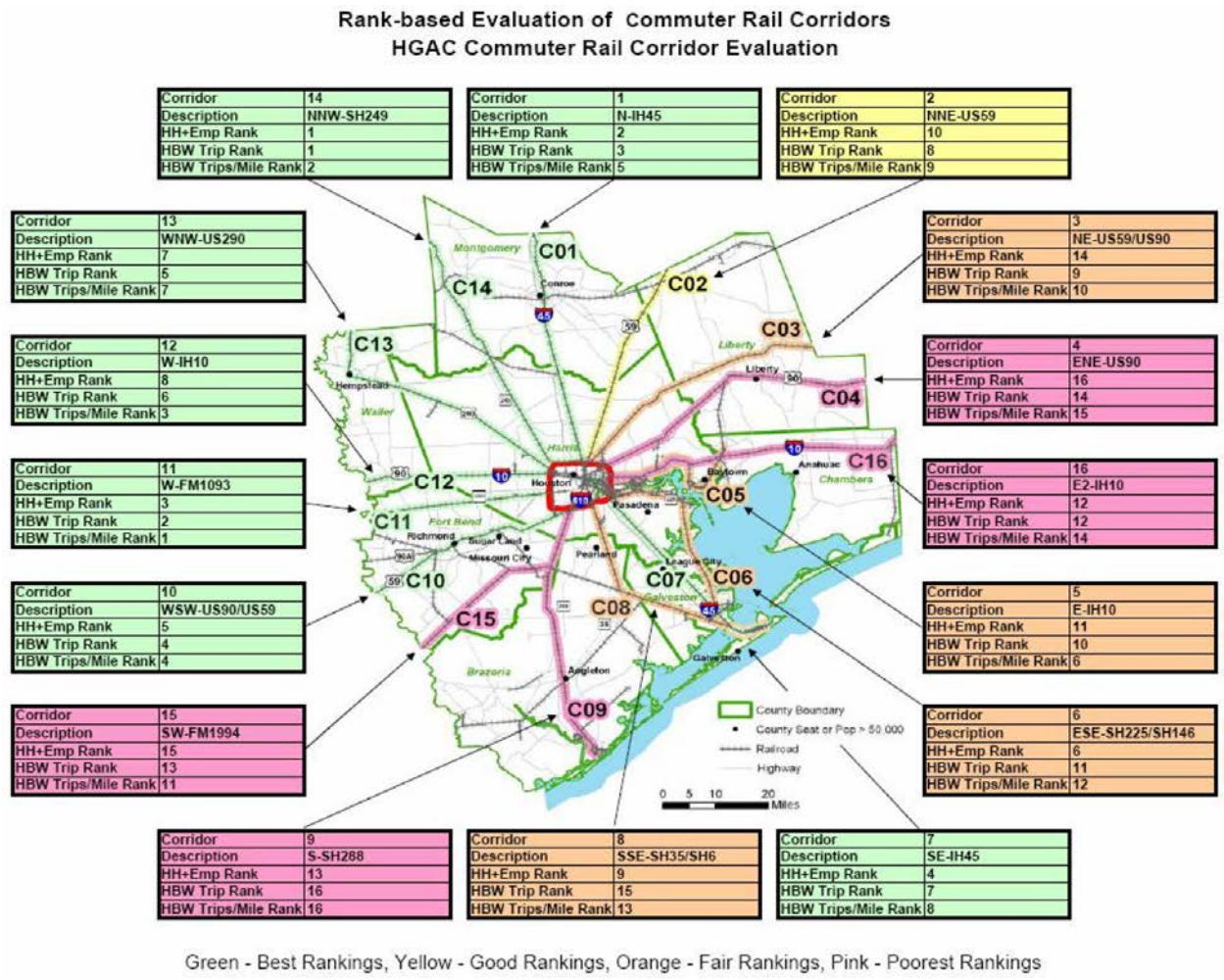

FIGURE 6. RELATIVE RANK OF POTENTIAL COMMUTER RAIL CORRIDORS (H-GAC)

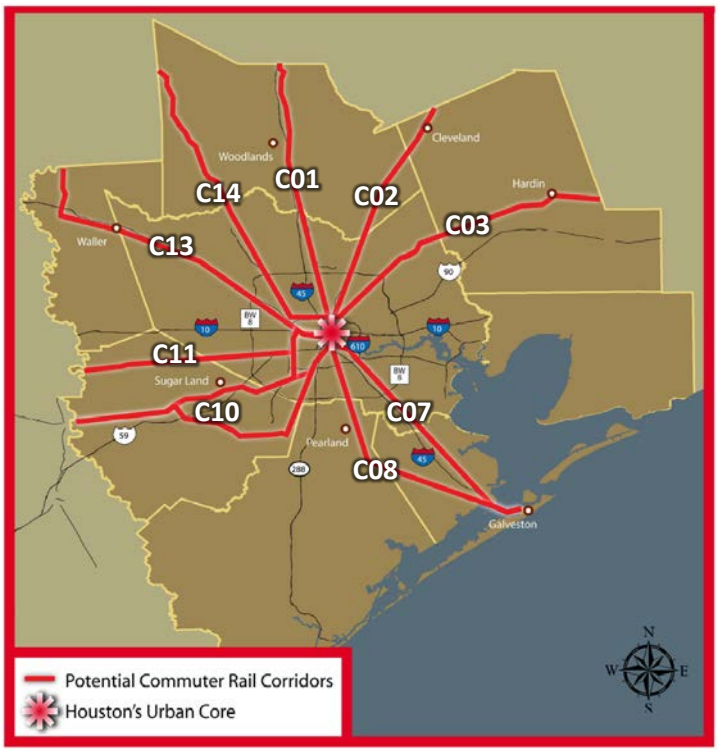

FIGURE 7. POTENTIAL COMMUTER RAIL CORRIDORS (H-GAC)

FIGURE 8. BASELINE SYSTEM PLAN (H-GAC)

H-GAC used the ranking analysis to identify a list of nine corridors to evaluate further and designated these as principal corridors for further planning efforts (see Figure 7):

- Hardy Toll Rd / IH 45 North (C01),
- US 59 North (C02),
- Lake Houston / Huffman (C03),
- SH 3 / IH 45 South (C07),
- SH 35 / SH 6 (C08),
- US 59 South / 90A (C10),
- Westpark Toll Road (C11),
- US 290 (C13), and
- SH 249 / FM 1774 (C14).

H-GAC worked with railroad operators in the region to determine which corridors may be able to operate as shared track commuter rail based on freight train frequency, infrastructure capacity, and other concerns. In the end, five of the corridors were chosen to form a baseline commuter rail system plan operated primarily or entirely as shared track service (see Figure 8).

The five corridors in the baseline system plan were:

- SH 3 / IH 45 South (C07),
- SH 35 (C08),
- US 90A (C10),
- US 290 (C13), and
- SH 249 / FM 1774 (C14).

The workshop will first take a close look at ROW for the five corridors in the baseline system plan and will then review ROW for additional principal corridors.

Considerations for Feasibility

The workshop is essentially the first filter in the decision-making process as the region takes a fresh look at commuter rail service. ROW will be the primary topic of concern and discussion in the workshop. If ROW exists in one or more corridors, then the next step is for GCRD and stakeholders to conduct further planning studies. This section highlights some considerations to keep in mind while discussing shared corridor or shared ROW commuter rail. Please note this list is not exhaustive—rather, these are the types of considerations that will be part of a feasibility assessment to evaluate shared corridor or shared ROW commuter rail.

Safety and Related Matters

- Center-line distance between tracks affects safety in case of derailment, spills, etc. and provides for off-track maintenance activity.
- Monitoring technology and positive train control provide for traffic control and train management. These systems can alert operators to potential hazards—especially important at shared grade crossings—but also loss-of-shunt problems, broken rails, or other issues that may result in derailment.
- Curve super-elevation can be a challenge for shared corridors because higher speeds for commuter rail require more stringent geometry and maintenance. Heavily banked curves allow for higher speeds for commuter rail but may cause problems for freight operations.
- Typically, there are fences or physical walls between separate tracks in the ROW to prevent maintenance workers and commuter rail riders from crossing tracks and entering the path of freight rail operations. Crash walls provide stronger barriers between tracks and corridor edges to minimize the risk in the case of train derailment.
- Grade separation in shared corridors may be necessary when there are multiple grade crossings; or, potential conflicts with auto traffic, or the corridor is susceptible to flooding. Grade separations also provide a higher level of safety between the two rail operations.

Infrastructure and Rolling Stock

- With large concentrations of commuters and demand for trips during peak hours in peak directions, commuter services may use bi-level rolling stock in order to increase train capacity without the need for extending station platforms or facilities. The bi-level vehicles have higher vertical profiles to consider.
- Low-level and high-level station platforms may present a challenge in shared track operations, but for shared corridor platforms height is less an issue due to separate tracks.
- Gauntlet tracks may be constructed to allow freight trains to be shifted from the main track and not interfere with the clearance envelope of the commuter platform.

Planning and Operations

- When trains are operating in shared corridor or ROW, it is not necessary for them to follow different schedules or adjust service according to peak hours. Typically, time separation is used for systems sharing track with each other, relegating commuter trains to peak hours and freight trains to non-peak hours. If there is incidental shared track at portions of the corridor or ROW, then temporal separation of operations may be necessary.
- Protocols must be in place to contact operators of the other agency if a problem occurs on a line. These problems could include obstructions, derailments, emergency brake applications, or simple delays in operations that may happen at any given time and affect adjacent or crossed tracks. Protocols are commonplace and widely used and accepted by the freight rail industry.

Economic and Institutional

- Ownership of the corridor or ROW may vary greatly depending on the specific agreement between freight and commuter rail. Access can be acquired through a variety of means, including property leases, easements, shared-use agreements, operating rights purchases, sales agreements, and franchises.
- Commuter and freight rail operators may choose to share or coordinate track maintenance practices on adjacent or nearby track, especially during initial construction phases.
- Future land use along shared corridors, i.e., heavy industrial land uses, may be affected by establishment of shared corridor commuter rail due to agreements about freight and commuter track crossings. The objective is to look at opportunities to provide commuter rail service as an additional travel alternative and also to support freight rail economic growth.
- Shared corridor commuter rail may be constructed in any available ROW. For example, Rail Runner in New Mexico is an example of a commuter rail service built in highway ROW.
- In the case that transit and freight services in a corridor share rail or highway crossing protection, it is important for maintenance personnel to understand the standards and safety practices for both services.

Contact Information

Thank you for reviewing this background paper to prepare for the workshop!

If you have questions or suggestions, please feel free to contact:

- Maureen Crocker, GCRD Executive Director at (713) 843-5451 or *maureen.crocker@gcrd.net*; or
- Linda Cherrington, Transportation Planning Division Head, Texas A&M Transportation Institute at (713) 613-9240 or *L-Cherrington@tamu.edu.*