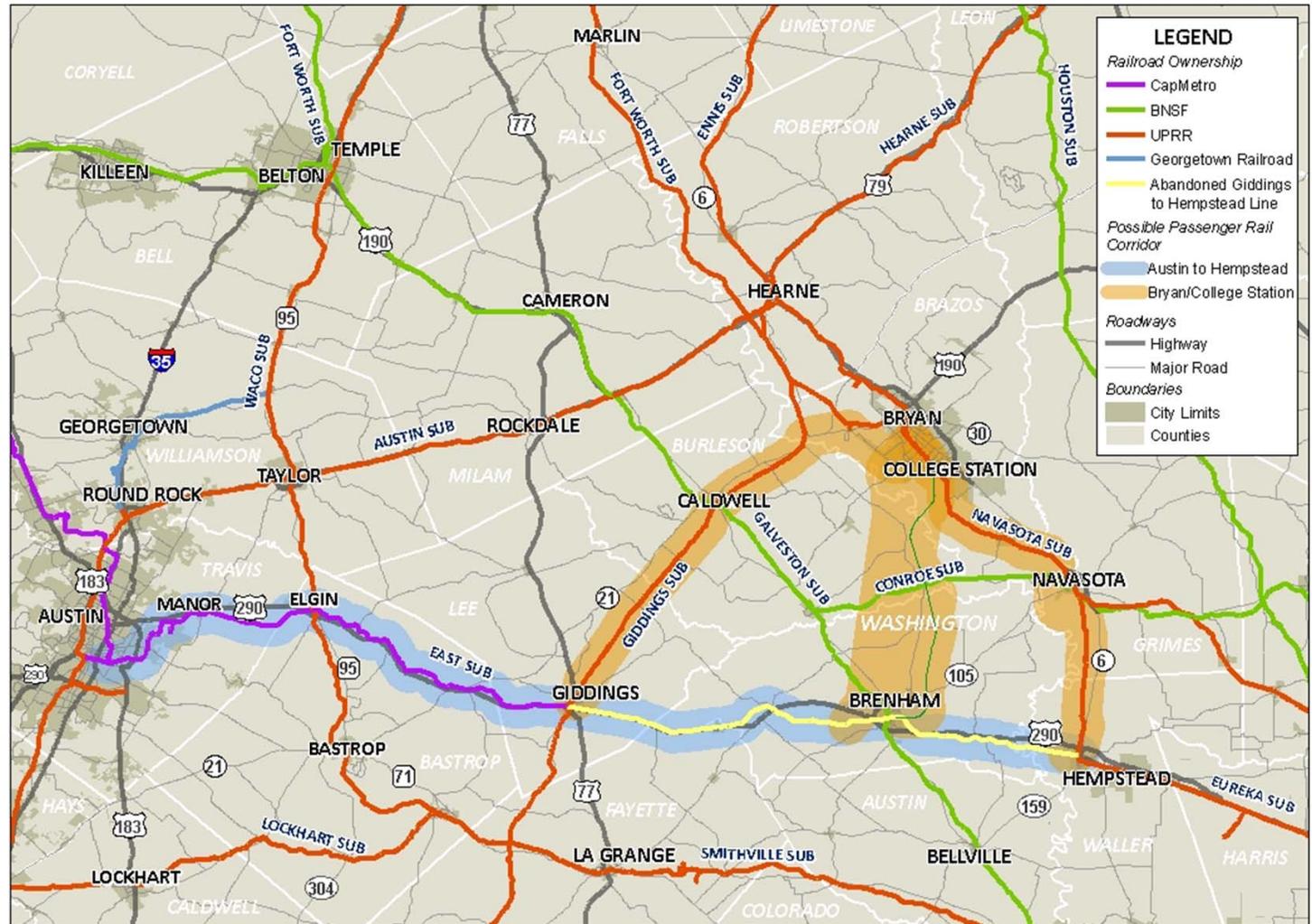


Austin to Houston Passenger Rail Study

Houston-Galveston Area Council

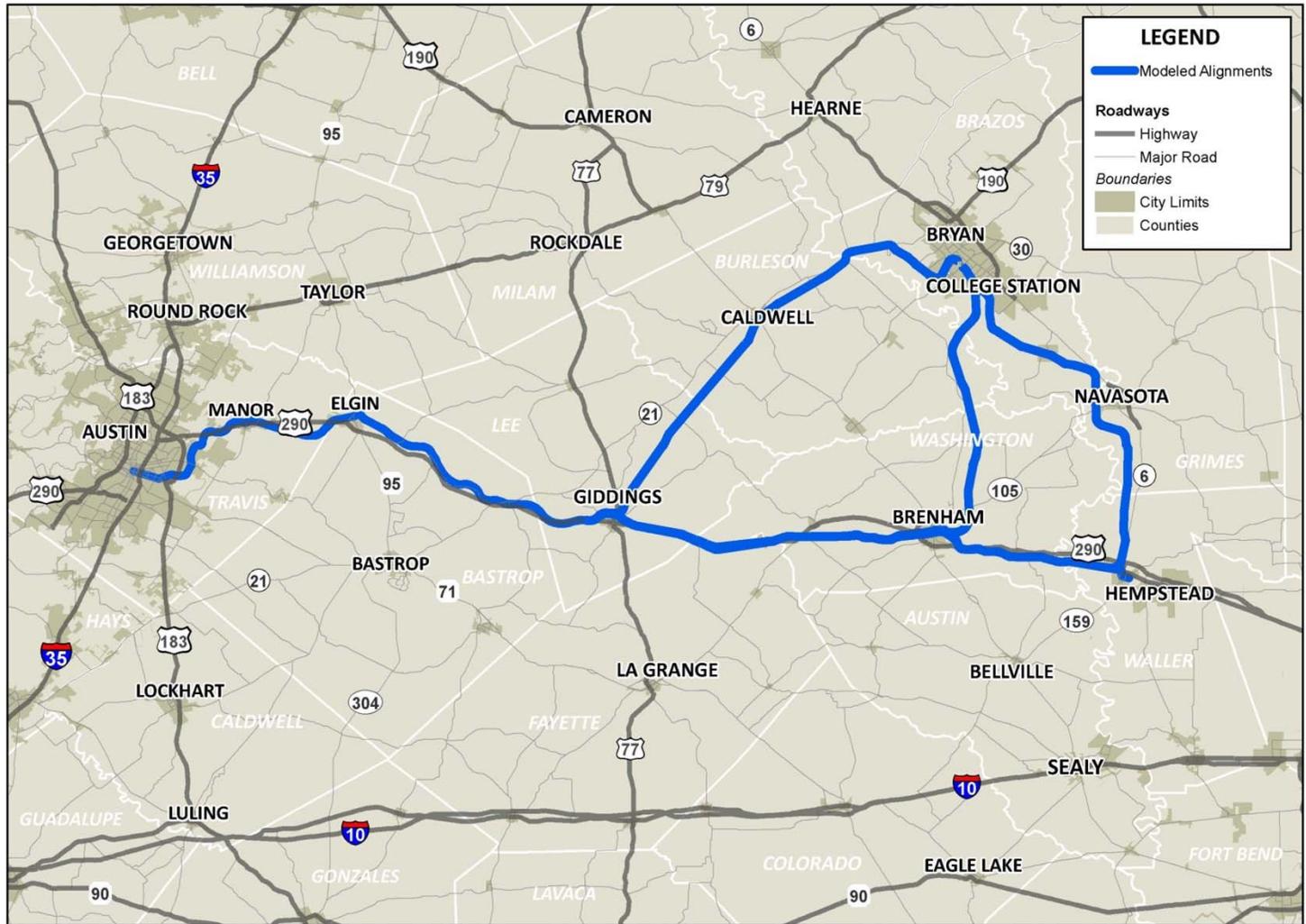
December 16, 2011

Study Area



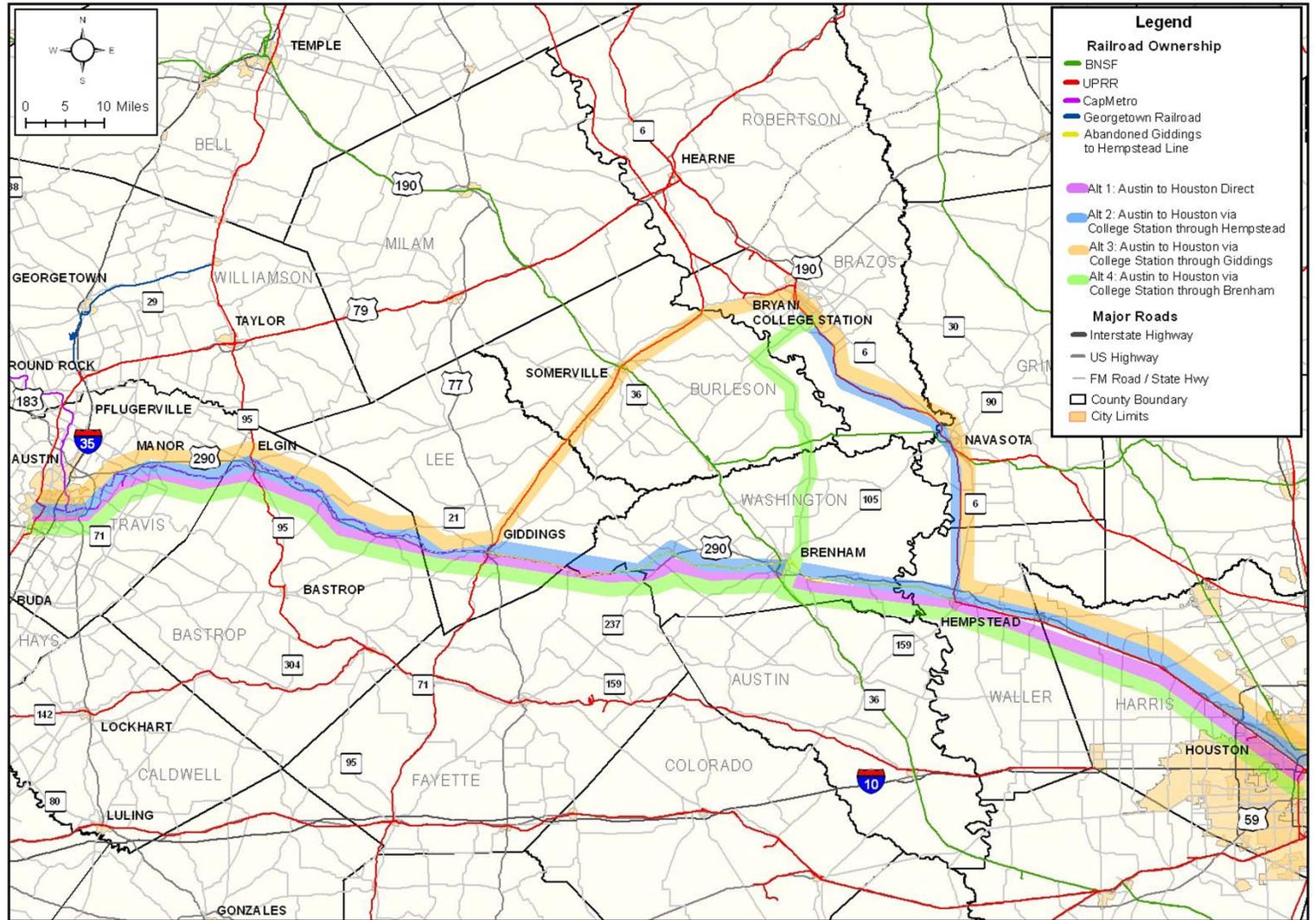
AUSTIN-TO-HOUSTON PASSENGER RAIL STUDY | OVERALL STUDY AREA

Modeled Alignments



AUSTIN TO HOUSTON PASSENGER RAIL STUDY MODELED ALIGNMENTS

Route Options



Passenger Operations – Start-Up

- **Two** round trips with morning departure and evening return (one in each direction) daily between Austin and Houston (only modeled to Hempstead)
 - Weekday trip times accommodate business travel
 - Weekend trip times accommodate leisure travel including sporting events
- 2 train sets

Passenger Operations – Build-Out

- **Four** round trips with morning departures and evening returns (two in each direction) daily between Austin and Houston (only modeled to Hempstead) on weekdays
 - Weekday trip times accommodate business travel
- **Two** round trips with morning departure and evening return (one in each direction) daily between Austin and Houston (only modeled to Hempstead) on weekends
 - Weekend trip times accommodate leisure travel including sporting events
- 4 train sets

Schedule – Option 1, Start-Up

| EASTBOUND | Austin to Houston Service (Direct) | | | | |
|-----------------|------------------------------------|-----------------|---------------|---------------|---------------|
| | Station | Dwell (m:ss) | 101 (h:mm) | 105 (h:mm) | 701 (h:mm) |
| Austin | ---- | 7:03 | 17:38 | 8:00 | 20:00 |
| Elgin | 3:00 | 7:37 | 18:12 | 8:34 | 20:34 |
| Giddings | 2:00 | 7:56 | 18:31 | 8:53 | 20:53 |
| Brenham | 2:00 | 8:24 | 18:59 | 9:21 | 21:21 |
| Hempstead | 3:00 | 8:40 | 19:15 | 9:37 | 21:37 |
| Houston | ---- | 9:45 | 20:20 | 10:42 | 22:42 |
| Total Trip Time | | 2:42 | 2:42 | 2:42 | 2:42 |
| Operating Days | | M-F | M-F | Sa, Su | Sa, Su |
| WESTBOUND | Houston to Austin Service (Direct) | | | | |
| | Station | Dwell (m:ss) | 102 (h:mm) | 106 (h:mm) | 702 (h:mm) |
| Houston | ---- | 6:42 | 17:17 | 7:39 | 19:39 |
| Hempstead | 3:00 | 7:50 | 18:25 | 8:47 | 20:47 |
| Brenham | 2:00 | 8:07 | 18:42 | 9:04 | 21:04 |
| Giddings | 2:00 | 8:36 | 19:11 | 9:33 | 21:33 |
| Elgin | 3:00 | 8:57 | 19:32 | 9:54 | 21:54 |
| Austin | ---- | 9:30 | 20:05 | 10:27 | 22:27 |
| Total Trip Time | | 2:48 | 2:48 | 2:48 | 2:48 |
| Operating Days | | M-F | M-F | Sa, Su | Sa, Su |



Travel Times & Speeds

| Route Segment | Modeled Travel Time (includes station dwells) | Modeled Average Speed of Passenger Trains |
|--|---|---|
| Downtown Austin Station-Austin Junction/ Wye | 9 min. | 8 to 10 mph |
| Austin Junction-Elgin | 24 to 25 min. | 67 to 74 mph |
| Elgin-Giddings | 19 to 21 min. | 75 to 80 mph |
| Giddings-Brenham | 28 to 30 min. | 77 to 81 mph |
| Brenham-Hempstead | 14 to 18 min. | 61 to 75 mph |
| Hempstead-Houston* | 65 min. | 50 mph |
| Hempstead-College Station (Option 2) | 31 to 34 min. | 83 to 93 mph |
| Giddings-College Station (Option 3) | 44 to 48 min. | 66 to 72 mph |
| Brenham-College Station (Option 4) | 24 to 29 min. | 67 to 72 mph |



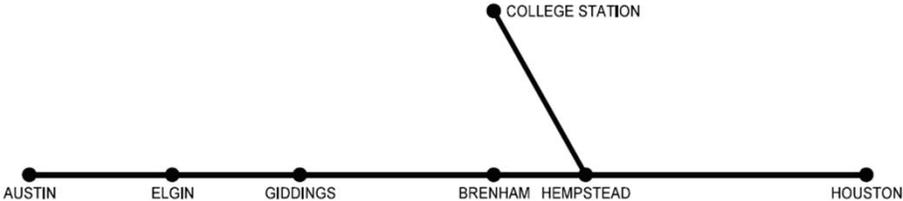
Route Comparisons

Note:
Track Miles
are Austin to
Hempstead

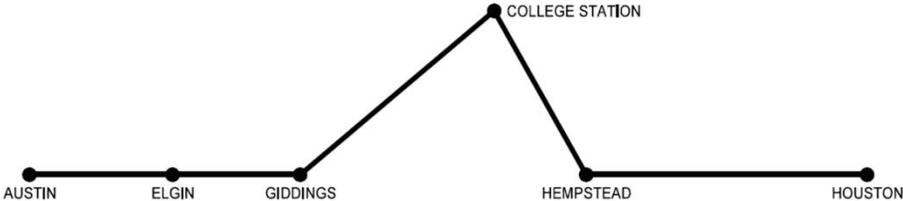
- Option 1 (Direct) – Travel time: 2:45, Track Miles: 109



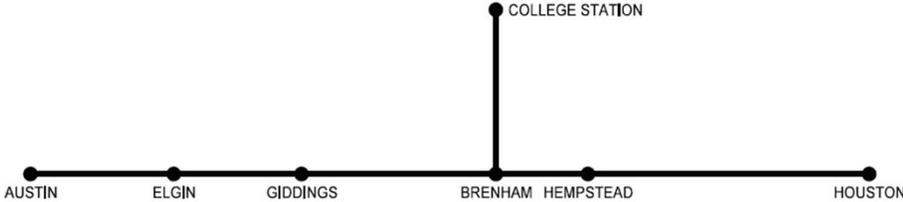
- Option 2 (Hempstead) – Travel time: 3:51, Track Miles: 152



- Option 3 (Giddings) – Travel time: 3:16, Track Miles: 149



- Option 4 (Brenham) – Travel time: 3:38, Track Miles: 141



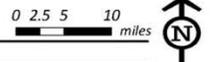
Infrastructure Requirements

- Upgrades to Austin-to-Giddings Line
- New mainline tracks east of Giddings to Hempstead via the individual routes
- CTC system
- Options 1 (direct) & 2 (via Hempstead)
 - Start-Up: 3-mile-long passing siding
 - Build-Out: Additional 3-mile-long passing siding
- Option 3 (via Giddings)
 - Start-Up: 4-mile-long passing siding
 - Build-Out: Additional 7 miles of passing sidings (2 sidings)
- Option 4 (via Brenham)
 - Start-Up: 3-mile-long passing siding
 - Build-Out: Additional 7 miles of passing sidings (2 sidings)

Infrastructure Requirements



OPTION 1: INFRASTRUCTURE REQUIREMENTS



Infrastructure Requirements

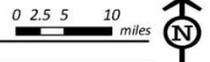


OPTION 2: INFRASTRUCTURE REQUIREMENTS

Infrastructure Requirements



OPTION 3: INFRASTRUCTURE REQUIREMENTS



Infrastructure Requirements



OPTION 4: INFRASTRUCTURE REQUIREMENTS



Estimated Costs

Note:
Does not include cost of infrastructure, etc. between Hempstead and Houston

Cost by Route Segment

| Route Segment | Total Cost (w/o sidings) | Cost per Mile |
|------------------------------|--------------------------|---------------|
| Austin to Giddings | \$439,660,000 | \$8,123,799 |
| Giddings to Hempstead | \$461,710,000 | \$8,105,481 |
| Hempstead to College Station | \$283,010,000 | \$6,554,192 |
| Giddings to College Station | \$387,660,000 | \$8,666,667 |
| Brenham to College Station | \$276,450,000 | \$8,580,508 |

Summary of Total Costs

| Austin to Houston Route Option | Start-Up | Build-Out |
|---|-----------------|-----------------|
| Option 1 (Direct) | \$936,710,000 | \$972,040,000 |
| Option 2 (to College Station via Hempstead route) | \$1,219,720,000 | \$1,255,050,000 |
| Option 3 (to College Station via Giddings route) | \$1,149,250,000 | \$1,199,510,000 |
| Option 4 (to College Station via Brenham route) | \$1,213,160,000 | \$1,263,420,000 |

- Includes rolling stock (estimated \$12 million per train set)
- Does not include operations and maintenance facilities

Conclusions

- Existing Austin to Giddings line:
 - The degree of curvature would need to be reduced (i.e. flattened) to increase allowable speeds
 - The existing jointed rail and timber ties would need to be replaced with continuously welded rail and concrete ties
 - The existing timber bridges would need to be replaced with new concrete or steel structures
 - A new CTC signal system with PTC overlay would need to be installed
- The cost per mile of upgrades along the existing Austin-to-Giddings segment nearly equals the cost per mile to build the segments of new track east of Giddings

Conclusions Cont'd

- The assumed start-up schedules could be supported by single track mainline with a 3 to 4-mile-long passing siding.
 - One additional siding would be required for the build-out schedule for route options 1 and 2
 - Two additional 3 to 4-mile-long sidings would be required for the build-out schedules for route options 3 and 4.



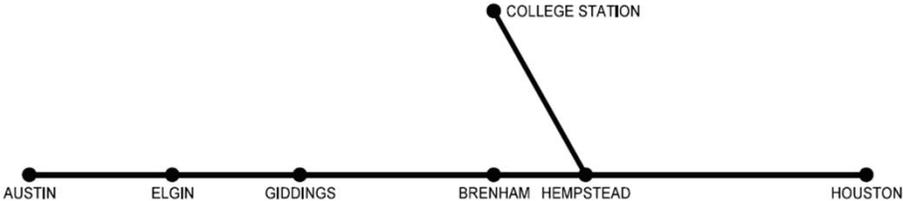
Conclusions Cont'd

Note:
Cost estimates
are Austin to
Hempstead

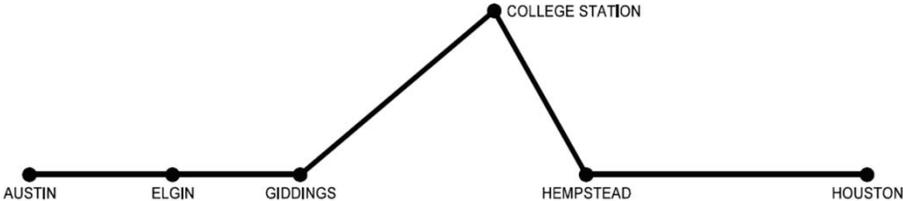
- Option 1 (Direct) – Travel time: 2:45, Estimated Cost: \$913 Million



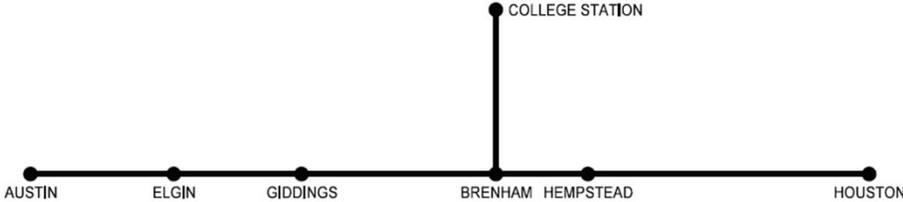
- Option 2 (Hempstead) – Travel time: 3:51, Estimated Cost: \$1.2 Billion



- Option 3 (Giddings) – Travel time: 3:16, Estimated Cost: \$1.13 Billion



- Option 4 (Brenham) – Travel time: 3:38, Estimated Cost: \$1.19 Billion





Any Questions?

