

North I-25 FEIS Travel Modeling

Model Development Options

The Travel Forecast Working Group (TFWG) met to discuss the travel modeling for the FEIS. The combined model was no longer up to date with the MPO models, and updating the combined model was considered. After some discussion, a range of options were identified for the FEIS combined model:

- A. "Use Existing 2030". This would be the application of the 2030 combined model, with no changes to the model structure.
- B. "Use Existing 2030 and Document the Likely Effect of 2035". A technical memorandum would be prepared that provides a quantitative analysis of the changes between the 2030 and 2035 datasets, and the likely result on highway and transit forecasts.
- C. "Use Existing Model Structure But Update the Networks and Land Use Datasets to 2035". The current structure and program code of the combined model would be retained, but the networks and land use datasets from the adopted 2035 RTPs from NFRMPO and DRCOG would be used. In addition, a 2035 No-Action model run would be produced.
- D. "Full Redevelopment". This would involve updating the combined model to reflect the new zone systems, improved models from the respective regions, and other improvements. In addition, a 2035 No-Action model run would be produced.

It was recognized that Option A would clearly be the least expensive option. However, after some discussion, it was suggested that updating to the 2035 data set would be beneficial for the long term validity of the FEIS and ROD. After much discussion, it was thought that given general direction from the federal agencies recently on other projects, a more direct approach would be preferable than Option B. It was recognized that Option D would be by far the most expensive option. Furthermore, it was noted that a key element of the combined model is the long bi-regional trips, which were based on origin and destination survey data from the Census and the DRCOG roadside survey. Since no new survey data is available, a major rebuilding of the combined model would not be worthwhile. For this reason, Option B of using the current model structure but updating the networks and land use to 2035 was recommended.

Updated Components of Combined Model

Title

| MPO Model | Component | Updated Combined Model |
|------------------|--|---|
| DRCOG | New Zones | No |
| | New 2005 & 2035 Socio-economics | Yes |
| | Updated model resource code | No |
| | Highway Network updates to 2005 and 2035 | 2005: Changes to major facilities in northern area (Inclusion of E-470 and Northwest Parkway; review of laneage on I-25) 2035: Changes to major facilities in northern area (review of laneage on I-25) |
| | Transit Network updates to 2005 and 2035 | 2005: No changes 2035: Updated headway and station set for North Metro and Northwest Rail |
| NFRMPO | New Zones | No |
| | New 2005 & 2035 Socio-economics | Yes |
| | Updated model resource code: New revalidated model with full mode choice module | No |
| | Highway Network updates to 2005 and 2035 | 2005: Updated laneage and facility type on arterials 2035: Updated laneage and facility type on arterials |
| | 2005 & 2035 Transit Network | 2005: Recoded *.rts to basically match NFR area transit coding 2035: Recoded *.rts to basically match NFR area transit coding for background routes; Added Mason Street BRT; Included Greeley-Loveland E-W |

Approach to Model Network Update

Merge New Highway Networks

- + accurate
- + less labor for network coding
- new networks have new zones
 - require script changes
 - require matrixgrower changes
 - require model overlap area recoding
 - require revising zone overlap area land use treatment
 - require reforming bi-regional trip table
 - other ?
- + better to match new models for validation

Title

Recode Existing Highway Networks

- labor intensive
- less accurate
- less regional
- + preserves existing combined model structure
- validation not a good match

Transit

RTD area:

- Merged Highway Networks
 - Use COG's new route system
- Recoded Highway networks
 - Recode old route system to match new route system
 - Geographic area?
 - Validation?

NFR area:

- Code route system to match new NFRMPO model

Model Development Tasks

- Obtain NFRMPO 2005 & 2035 model Data
- Obtain DRCOG 2005 & 2035 model Data
- Test Model Operation
- Review file management procedures
- Define coding QC procedures
- Code 2005 Highway Network
 - Original combined 2001 as base
 - match MPO 2005 networks
 - Include 2005 traffic counts
- QC 2005 highway network coding
- Code 2035 No-Action Highway Network
 - Original combined 2030 No Action as base
 - match MPO 2035 networks; except for I-25 in study area
- QC 2035 highway network coding
- Prepare 2005 zonal land use files in combined model format
- Prepare 2035 zonal land use files in combined model format
- Recode RTD area 2005 transit network
 - Original combined 2001 route system as base

Title

- Match RTD 2005 routes
 - geographic focus?
- Code NFR area 2005 transit network
 - Original combined 2001 route system as base
 - Match new NFRMPO Model 2005 route coding
- QC 2005 route system coding
- Recode RTD area 2035 transit network
 - Original combined 2030 No-Action route system as base
 - Match RTD 2035 routes
 - geographic focus?
- Code NFR area 2035 transit network
 - Original combined 2030 No-Action route system as base
 - Match new NFRMPO Model 2035 route coding
- QC 2035 route system coding
- Validation

Task Schedule

| | Task | Completion Date |
|--------------------------|--|------------------------|
| <input type="checkbox"/> | Obtain NFRMPO 2005 & 2035 model Data | October 10, 2008 |
| <input type="checkbox"/> | Obtain DRCOG 2005 & 2035 model Data | October 17, 2008 |
| <input type="checkbox"/> | Meet with RTD | October 17, 2008 |
| <input type="checkbox"/> | Review file management procedures | October 24, 2008 |
| <input type="checkbox"/> | Review coding QC procedures | October 24, 2008 |
| <input type="checkbox"/> | Code 2005 Highway Network <ul style="list-style-type: none"> ▪ Original combined 2001 as base ▪ match MPO 2005 networks ▪ Include 2005 traffic counts | October 31, 2008 |
| <input type="checkbox"/> | QC 2005 highway network coding | November 14, 2008 |
| <input type="checkbox"/> | Code 2035 No-Action Highway Network <ul style="list-style-type: none"> ▪ Original combined 2030 No Action as base ▪ match MPO 2035 networks; except for I-25 in study area | October 31, 2008 |
| <input type="checkbox"/> | QC 2035 highway network coding | November 14, 2008 |
| <input type="checkbox"/> | Prepare 2005 zonal land use files in combined model format | October 31, 2008 |
| <input type="checkbox"/> | Prepare 2035 zonal land use files in combined model format | October 31, 2008 |
| <input type="checkbox"/> | Recode RTD area 2005 transit network <ul style="list-style-type: none"> ▪ Original combined 2001 route system as base ▪ Match RTD 2005 routes <ul style="list-style-type: none"> ○ geographic focus? | November 7, 2008 |
| <input type="checkbox"/> | Code NFR area 2005 transit network | November 7, 2008 |

Title

| | | |
|--------------------------|---|-------------------|
| | <ul style="list-style-type: none"> ▪ Original combined 2001 route system as base ▪ Match new NFRMPO Model 2005 route coding | |
| <input type="checkbox"/> | QC 2005 route system coding | November 14, 2008 |
| <input type="checkbox"/> | Recode RTD area 2035 transit network <ul style="list-style-type: none"> ▪ Original combined 2030 No-Action route system as base ▪ Match RTD 2035 routes <ul style="list-style-type: none"> ○ geographic focus? | November 7, 2008 |
| <input type="checkbox"/> | Code NFR area 2035 transit network <ul style="list-style-type: none"> ▪ Original combined 2030 No-Action route system as base ▪ Match new NFRMPO Model 2035 route coding | November 7, 2008 |
| <input type="checkbox"/> | QC 2035 route system coding | November 14, 2008 |
| <input type="checkbox"/> | Validation <ul style="list-style-type: none"> ▪ Check highway volumes for reasonableness <ul style="list-style-type: none"> ○ Compare to original combined model; new NFRMPO models, and new DRCOG models ▪ Check transit volumes for reasonableness <ul style="list-style-type: none"> ○ Compare to original combined model; new NFRMPO models, and new DRCOG models | December 5, 2008 |
| | | |

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Date: April 24, 2009
To: Chris Primus
From: Jim Baker
Subject: North I-25 EIS Rail Travel Time Estimates

As requested, we have reviewed prior rail time estimates for this project and have suggested some modifications to reflect the service as proposed in this project's Draft Committee Vision Plan.

Prior estimates completed by Smith Myung were based on alignment drawings that were provided to him by Carter Burgess in 2005/2006. We do not have copies of those drawings, but are assuming that there have been no significant changes that would drastically affect travel times.

One significant alignment change is in Longmont. The prior work assumed the alignment coming south from Longmont would turn east towards I-25, with a station stop at Sugar Mill. The Draft Committee Vision Plan assumes North I-25 rail service will now use the Northwest rail line for service to/from downtown Denver. Thus, there will no longer be a stop at Sugar Mill. Instead, southbound trains will operate to 1st and Terry, then continue south on the Northwest rail line. It appears that the station-to-station distance from SH 66 to 1st and Terry is similar to the station-to-station distance from SH 66 to Sugar Mill. Thus, we have kept this travel time estimate unchanged.

When reviewing the prior travel time estimates, we noticed speed assumptions through Fort Collins and Loveland that appear inappropriate. The prior travel time estimate assumes 65-75 mph maximum speeds through Fort Collins and 70 mph maximum speeds through Loveland. We have modified this assumption to assume 25-35 mph maximum speeds through Fort Collins and 35 mph maximum speeds through Loveland. These changes have resulted in 4 minutes of additional travel time from Longmont to Fort Collins.

Finally, the prior travel time estimate for a North Metro rail service extension from 162nd Avenue to CR 8/I-25 remains unchanged from the prior work effort.

Tables 1 and 2 present station-to-station travel time estimates for the Northwest-BNSF rail line extension from Longmont to Fort Collins, and for the North Metro rail line extension from 162nd Avenue to CR 8/I-25. Table 3 presents resulting average speeds between stations. Average speeds remain unchanged from your current coded network speeds, with the exception of the following three links:

- Fort Collins to CSU
- CSU to South Transit Center
- Loveland-29th Street to Loveland-US 34

Average speeds for these three links should be changed to reflect the revised travel times presented in this memo.

Table 1

**DENVER I-25 NORTH EIS
DMU SOUTHBOUND TRAVEL TIME ESTIMATES
Fort Collins to 1st & Terry in Longmont
Draft Committee Vision Plan**

| Station | Max Spd . (mph) | Distance (miles) | | Run Time (hr:min:sec) | Delay Time (hr:min:sec) | Dwell Time (hr:min:sec) | Total Time (hr:min:sec) |
|-----------------------------|--------------------|------------------|--------------|--------------------------|----------------------------|----------------------------|----------------------------|
| | | Incr. | Total | | | | |
| Fort Collins | | 0.00 | | | | 0:00:00 | 0:00:00 |
| | 25 | 1.23 | | 0:03:13 | 0:00:00 | | |
| CSU | | 1.23 | | | | 0:01:00 | 0:04:13 |
| | 35 | 3.75 | | 0:06:50 | 0:00:00 | | |
| South Transit Center | | 4.98 | | | | 0:01:00 | 0:12:03 |
| | 50 | 0.44 | | 0:01:01 | 0:00:00 | | |
| Start of Curve 1 | | | 5.42 | | | 0:00:00 | 0:13:04 |
| | 50 | 0.17 | | 0:00:13 | 0:00:00 | | |
| End of Curve 1 | | | 5.59 | | | 0:00:00 | 0:13:17 |
| | 75 | 1.07 | | 0:01:21 | 0:00:00 | | |
| Start of Curve 2 | | | 6.66 | | | 0:00:00 | 0:14:38 |
| | 75 | 0.20 | | 0:00:10 | 0:00:00 | | |
| End of Curve 2 | | | 6.87 | | | 0:00:00 | 0:14:48 |
| | 75 | 0.85 | | 0:00:41 | 0:00:00 | | |
| Start of Curve 3 | | | 7.72 | | | 0:00:00 | 0:15:29 |
| | 75 | 0.19 | | 0:00:09 | 0:00:00 | | |
| End of Curve 3 | | | 7.91 | | | 0:00:00 | 0:15:38 |
| | 75 | 1.15 | | 0:00:56 | 0:00:00 | | |
| Start of Curve 4 | | | 9.06 | | | 0:00:00 | 0:16:34 |
| | 65 | 0.25 | | 0:00:14 | 0:00:00 | | |
| End of Curve 4 | | | 9.31 | | | 0:00:00 | 0:16:48 |
| | 65 | 0.43 | | 0:00:24 | 0:00:00 | | |
| Start of Curve 5 | | | 9.74 | | | 0:00:00 | 0:17:12 |
| | 50 | 0.19 | | 0:00:14 | 0:00:00 | | |
| End of Curve 5 | | | 9.92 | | | 0:00:00 | 0:17:26 |
| | 70 | 2.01 | | 0:02:22 | 0:00:00 | | |
| Loveland - 29th St | | 11.93 | | | | 0:01:00 | 0:20:48 |
| | 35 | 1.80 | | 0:03:30 | 0:00:00 | | |
| Loveland - US 34 | | 13.73 | | | | 0:01:00 | 0:25:18 |
| | 35 | 0.19 | | 0:00:35 | 0:00:00 | | |
| Start of Curve 1 | | | 13.92 | | | 0:00:00 | 0:25:53 |
| | 45 | 0.18 | | 0:00:20 | 0:00:00 | | |
| End of Curve 1 | | | 14.10 | | | 0:00:00 | 0:26:13 |
| | 45 | 0.40 | | 0:00:32 | 0:00:00 | | |
| Start of Curve 2 | | | 14.51 | | | 0:00:00 | 0:26:45 |
| | 45 | 0.20 | | 0:00:16 | 0:00:00 | | |
| End of Curve 2 | | | 14.70 | | | 0:00:00 | 0:27:01 |
| | 45 | 0.39 | | 0:00:33 | 0:00:00 | | |
| Start of Curve 3 | | | 15.09 | | | 0:00:00 | 0:27:34 |
| | 30 | 0.28 | | 0:00:34 | 0:00:00 | | |
| End of Curve 3 | | | 15.38 | | | 0:00:00 | 0:28:08 |
| | 30 | 0.02 | | 0:00:03 | 0:00:00 | | |
| Start of Curve 4 | | | 15.40 | | | 0:00:00 | 0:28:11 |
| | 30 | 0.35 | | 0:00:42 | 0:00:00 | | |
| End of Curve 4 | | | 15.75 | | | 0:00:00 | 0:28:53 |
| | 30 | 0.04 | | 0:00:05 | 0:00:00 | | |
| Start of Curve 5 | | | 15.79 | | | 0:00:00 | 0:28:58 |
| | 30 | 0.24 | | 0:00:29 | 0:00:00 | | |
| End of Curve 5 | | | 16.03 | | | 0:00:00 | 0:29:27 |
| | 75 | 4.04 | | 0:04:22 | 0:00:00 | | |
| Berthoud - SH 56 | | 20.07 | | | | 0:01:00 | 0:34:49 |

DENVER I-25 NORTH EIS
DMU SOUTHBOUND TRAVEL TIME ESTIMATES
Fort Collins to 1st & Terry in Longmont
Draft Committee Vision Plan

| Station | Max Spd . (mph) | Distance (miles) | | Run Time (hr:min:sec) | Delay Time (hr:min:sec) | Dwell Time (hr:min:sec) | Total Time (hr:min:sec) |
|-------------------------|--------------------|------------------|--------------|--------------------------|----------------------------|----------------------------|----------------------------|
| | | Incr. | Total | | | | |
| Start of Curve 1 | 50 | 0.78 | 20.86 | 0:01:26 | 0:00:00 | 0:00:00 | 0:36:15 |
| End of Curve 1 | 50 | 0.51 | 21.36 | 0:00:36 | 0:00:00 | 0:00:00 | 0:36:51 |
| Start of Curve 2 | 55 | 0.33 | 21.69 | 0:00:25 | 0:00:00 | 0:00:00 | 0:37:16 |
| End of Curve 2 | 55 | 0.14 | 21.83 | 0:00:09 | 0:00:00 | 0:00:00 | 0:37:25 |
| Start of Curve 3 | 55 | 0.02 | 21.85 | 0:00:02 | 0:00:00 | 0:00:00 | 0:37:27 |
| End of Curve 3 | 60 | 0.18 | 22.04 | 0:00:15 | 0:00:00 | 0:00:00 | 0:37:42 |
| Start of Curve 4 | 65 | 0.70 | 22.74 | 0:00:43 | 0:00:00 | 0:00:00 | 0:38:25 |
| End of Curve 4 | 60 | 0.13 | 22.87 | 0:00:08 | 0:00:00 | 0:00:00 | 0:38:33 |
| Start of Curve 5 | 60 | 0.04 | 22.91 | 0:00:02 | 0:00:00 | 0:00:00 | 0:38:35 |
| End of Curve 5 | 60 | 0.14 | 23.05 | 0:00:09 | 0:00:00 | 0:00:00 | 0:38:44 |
| Start of Curve 6 | 60 | 0.11 | 23.17 | 0:00:07 | 0:00:00 | 0:00:00 | 0:38:51 |
| End of Curve 6 | 60 | 0.25 | 23.42 | 0:00:15 | 0:00:00 | 0:00:00 | 0:39:06 |
| Start of Curve 7 | 60 | 1.36 | 24.78 | 0:01:23 | 0:00:00 | 0:00:00 | 0:40:29 |
| End of Curve 7 | 45 | 0.19 | 24.97 | 0:00:15 | 0:00:00 | 0:00:00 | 0:40:44 |
| Start of Curve 8 | 50 | 0.44 | 25.41 | 0:00:35 | 0:00:00 | 0:00:00 | 0:41:19 |
| End of Curve 8 | 40 | 0.26 | 25.67 | 0:00:23 | 0:00:00 | 0:00:00 | 0:41:42 |
| Longmont - SH 66 | 75 | 1.80 | 27.46 | 0:02:25 | 0:00:00 | 0:01:00 | 0:45:07 |
| Start of Curve 1 | 40 | 1.91 | 29.37 | 0:03:12 | 0:00:00 | 0:00:00 | 0:48:19 |
| End of Curve 1 | 35 | 0.26 | 29.63 | 0:00:27 | 0:00:00 | 0:00:00 | 0:48:46 |
| Start of Curve 2 | 35 | 0.01 | 29.64 | 0:00:01 | 0:00:00 | 0:00:00 | 0:48:47 |
| End of Curve 2 | 35 | 0.19 | 29.84 | 0:00:20 | 0:00:00 | 0:00:00 | 0:49:07 |
| Start of Curve 3 | 35 | 0.53 | 30.36 | 0:00:54 | 0:00:00 | 0:00:00 | 0:50:01 |
| End of Curve 3 | 35 | 0.18 | 30.54 | 0:00:19 | 0:00:00 | 0:00:00 | 0:50:20 |
| Start of Curve 4 | 35 | 0.01 | 30.56 | 0:00:01 | 0:00:00 | 0:00:00 | 0:50:21 |
| End of Curve 4 | 35 | 0.06 | 30.61 | 0:00:06 | 0:00:00 | 0:00:00 | 0:50:27 |

DENVER I-25 NORTH EIS
DMU SOUTHBOUND TRAVEL TIME ESTIMATES
Fort Collins to 1st & Terry in Longmont
Draft Committee Vision Plan

| Station | Max Spd . (mph) | Distance (miles) | | Run Time (hr:min:sec) | Delay Time (hr:min:sec) | Dwell Time (hr:min:sec) | Total Time (hr:min:sec) |
|----------------------|--------------------------|------------------|-------------------|--------------------------|----------------------------|----------------------------|----------------------------|
| | | Incr. | Total | | | | |
| Start of Curve 5 | 35 | 0.07 | 30.68 | 0:00:07 | 0:00:00 | 0:00:00 | 0:50:34 |
| End of Curve 5 | 35 | 0.11 | 30.80 | 0:00:12 | 0:00:00 | 0:00:00 | 0:50:46 |
| Start of Curve 6 | 35 | 0.22 | 31.01 | 0:00:22 | 0:00:00 | 0:00:00 | 0:51:08 |
| End of Curve 6 | 35 | 0.06 | 31.07 | 0:00:06 | 0:00:00 | 0:00:00 | 0:51:14 |
| Start of Curve 7 | 35 | 0.03 | 31.11 | 0:00:04 | 0:00:00 | 0:00:00 | 0:51:18 |
| End of Curve 7 | 35 | 0.05 | 31.16 | 0:00:06 | 0:00:00 | 0:00:00 | 0:51:24 |
| Start of Curve 8 | 35 | 0.04 | 31.20 | 0:00:04 | 0:00:00 | 0:00:00 | 0:51:28 |
| End of Curve 8 | 35 | 0.10 | 31.30 | 0:00:10 | 0:00:00 | 0:00:00 | 0:51:38 |
| | 25 | 0.05 | | 0:00:13 | 0:00:00 | | |
| 1st and Terry | | | 31.34 | | | 0:01:00 | 0:52:51 |
| TOTAL | | | 31.34 | 0:45:51 | 0:00:00 | 0:07:00 | 0:52:51 |
| | Avg Stn Spacing = | | 4.48 miles | | | Avg Speed = | 35.58 |

Notes:

Distances and curve restrictions from plan drawings provided by Carter Burgess, July 2006.

Some design curves from drawings not noted since operating speeds dictated by acceleration/deceleration rather than design speed.

Table 2

**DENVER I-25 NORTH EIS
 EMU SOUTHBOUND TRAVEL TIME ESTIMATES
 North Metro Line extension to CR 8/I-25
 Draft Committee Vision Plan**

| Station | Max Spd . (mph) | Distance (miles) | | Run Time (hr:min:sec) | Delay Time (hr:min:sec) | Dwell Time (hr:min:sec) | Total Time (hr:min:sec) |
|---------------------------|--------------------------|------------------|-------------------|--------------------------|----------------------------|----------------------------|----------------------------|
| | | Incr. | Total | | | | |
| County Rd 8 / I-25 | | | 0.00 | | | 0:00:00 | 0:00:00 |
| Start of Curve 9 | 50 | 0.42 | 0.42 | 0:01:00 | 0:00:00 | 0:00:00 | 0:01:00 |
| End of Curve 9 | 60 | 0.40 | 0.82 | 0:00:33 | 0:00:00 | 0:00:00 | 0:01:33 |
| Start of Curve 10 | 60 | 0.06 | 0.88 | 0:00:04 | 0:00:00 | 0:00:00 | 0:01:37 |
| End of Curve 10 | 60 | 0.25 | 1.14 | 0:00:15 | 0:00:00 | 0:00:00 | 0:01:52 |
| Start of Curve 11 | 70 | 0.60 | 1.74 | 0:00:41 | 0:00:00 | 0:00:00 | 0:02:33 |
| End of Curve 11 | 70 | 0.24 | 1.98 | 0:00:12 | 0:00:00 | 0:00:00 | 0:02:45 |
| Start of Curve 12 | 70 | 0.14 | 2.12 | 0:00:07 | 0:00:00 | 0:00:00 | 0:02:52 |
| End of Curve 12 | 75 | 0.46 | 2.58 | 0:00:28 | 0:00:00 | 0:00:00 | 0:03:20 |
| Start of Curve 13 | 75 | 1.32 | 3.90 | 0:01:03 | 0:00:00 | 0:00:00 | 0:04:23 |
| End of Curve 13 | 75 | 0.28 | 4.19 | 0:00:14 | 0:00:00 | 0:00:00 | 0:04:37 |
| Start of Curve 14 | 75 | 1.06 | 5.25 | 0:00:57 | 0:00:00 | 0:00:00 | 0:05:34 |
| End of Curve 14 | 75 | 0.46 | 5.71 | 0:00:26 | 0:00:00 | 0:00:00 | 0:06:00 |
| 162nd Ave./N. Metro | 40 | 0.13 | 5.84 | 0:00:22 | 0:00:00 | 0:01:00 | 0:07:22 |
| TOTAL | | | 5.84 | 0:06:22 | 0:00:00 | 0:01:00 | 0:07:22 |
| | Avg Stn Spacing = | | 1.95 miles | | | Avg Speed = | 47.57 |

Notes:

Distances and curve restrictions from plan drawings provided by Carter Burgess October 4, 2005.
 Dent segment from I-25 to SH 7 scaled from Mapquest. (Curve restriction based on rough estimate.)

**Table 3
NORTHWEST RAIL BNSF RAIL EXT. TIMES**

| Segment | Distance | Time | Avg. Speed |
|----------------------|--------------|----------------|--------------|
| Fort Collins | | | |
| | 1.23 | 0:04:13 | 17.50 |
| CSU | | | |
| | 3.75 | 0:07:50 | 28.72 |
| South Transit Center | | | |
| | 6.95 | 0:08:45 | 47.66 |
| Loveland-29th St. | | | |
| | 1.80 | 0:04:30 | 23.99 |
| Loveland-US 34 | | | |
| | 6.34 | 0:09:31 | 40.00 |
| Berthoud-SH 56 | | | |
| | 7.39 | 0:10:18 | 43.03 |
| Longmont-SH 66 | | | |
| | 3.88 | 0:07:44 | 30.12 |
| Longmont-1st & Terry | | | |
| Total | 31.34 | 0:52:51 | 35.58 |

NORTH METRO RAIL EXT. TIMES

| Segment | Distance | Time | Avg. Speed |
|-----------------------|----------|---------|------------|
| CR 8/I-25 | | | |
| | 5.84 | 0:07:22 | 47.57 |
| 162nd Street/N. Metro | | | |

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FEIS 2035 MODEL VALIDATION

Purpose

This document summarizes the validation findings for the FEIS travel demand model (Travel Model). The FEIS Travel Model updates previous efforts undertaken for the DEIS by including more recent information for roadways, transit enhancements, 2005 land use inputs, and 2035 land use inputs for the North I-25 EIS Study Area. These updates rely on information provided by North Front Range, Metropolitan Planning Organization (NFRMPO) and Denver Regional Council of Governments, Metropolitan Planning Organization (DRCOG).

The intent is to compare new forecasts results (year 2005 and 2035) with those forecasts done for the DEIS (year 2001 and 2030). In the case of 2005 forecasts, comparisons are also made against field observations. In the end, the purpose of this documentation is to demonstrate the Travel Model still is valid and useful for travel forecasting purposes.

The following sections of this document provide quantitative and writing explanation of the following:

- Input Comparisons
 - TAZ level differences in socio-economic inputs for 2005 and 2035
 - Quantify differences in socio-economic input data for the ½ mile and 4 mile buffer around planned transit stations
- Trip Generation by Trip Purpose
 - Comparison of FEIS Travel Model trip rates to DEIS trip rates
 - Comparison of FEIS Travel Model trip rates to NFRMPO and DRCOG trip rates
- Trip Distribution by Trip Purpose
 - Comparison of FEIS Travel Model trips to DEIS trips
 - Comparison of FEIS Travel Model trips to NFRMPO and DRCOG trips
- Mode Choice by Trip Purpose
 - Comparison of FEIS Travel Model trips to DEIS trips

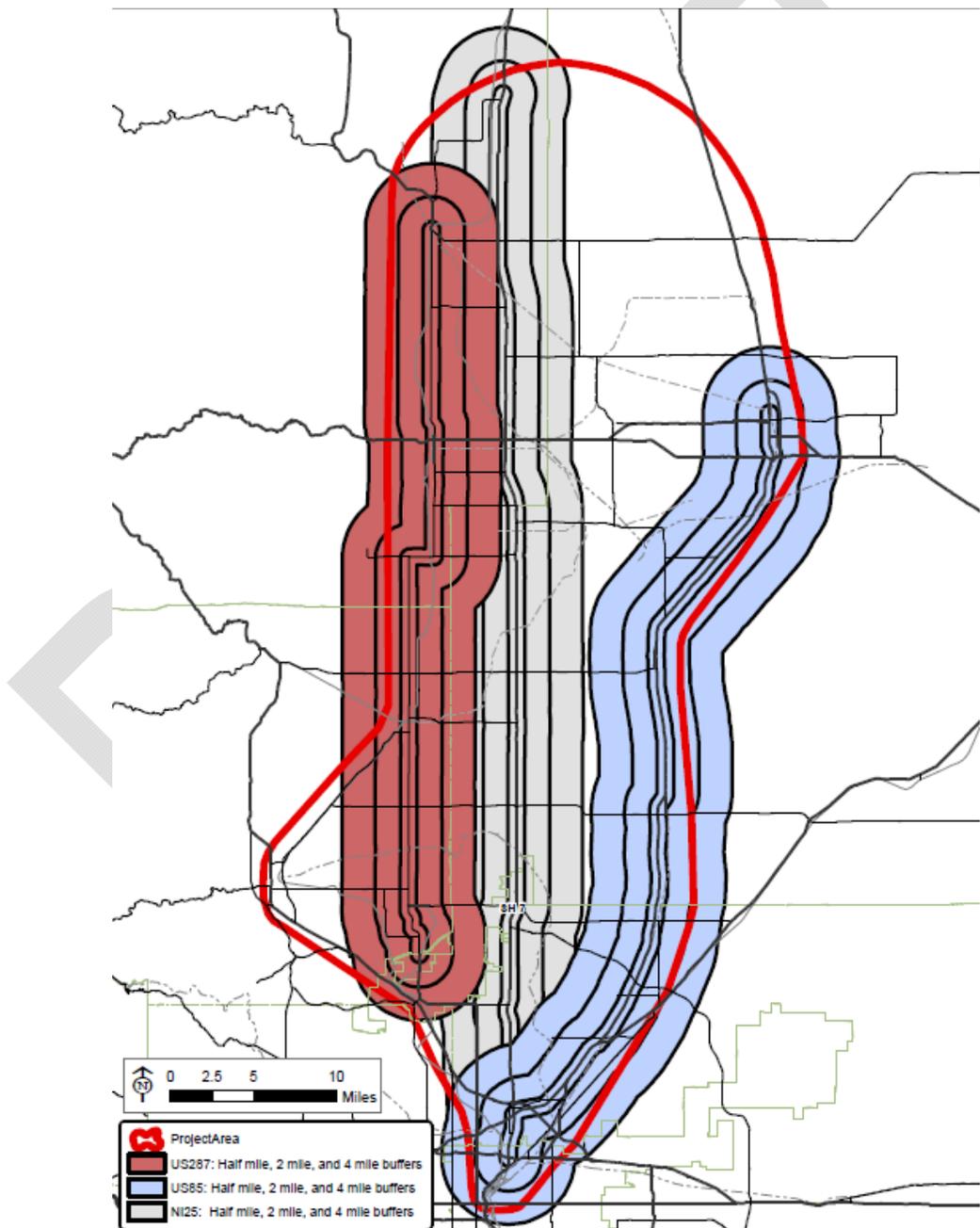
- Comparison of FEIS Travel Model trips to NFRMPO and DRCOG trips
- Trip Assignment
 - VMT comparisons FEIS to DEIS by alternative
 - VMT comparisons FEIS to NFRMPO and DRCOG
 - I-25 roadway assignments FEIS to DEIS
 - Screenline comparisons FEIS to DEIS and comparison to NFRMPO and DRCOG
- Transit Boarding Comparison
 - Comparison of 2030 DEIS transit boarding and 2035 FEIS boardings by route/mode

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Input Comparisons

Both DRCOG and NFRMPO provided new socio-economic (or Land use) input data for years 2005 and 2035. A comparison of the base year – 2001 (DEIS) and 2005 (FEIS) – and a comparison of the planning horizon year – 2030 (DEIS) and 2035 (FEIS) – follows.

The three major corridors – I-25, US-287, and US-85 were analyzed separately. A graphical depiction of the areas used is provided below, with a summary of the findings, and the data following.



In the base years, population increases north of E-470 between 2001 and 2005 within the 2-mile buffer of all three major corridors:

- I-25 – increase of 112% (27,500 people), with most of the growth between SH-14 and SH-60.
- US-287 – increase of 10% (25,600 people), with most of the growth north of SH-60.
- US-85 – increase of 6% (5,300 people), with growth near both ends of the corridor.

In the base years, employment increases in the I-25 and US-287 corridors:

- I-25 – increase of 20% (5,300 jobs), with most of the growth between SH-14 and SH-60 and between SH-119 and E-470.
- US-287 – increase of 9% (12,300 jobs), with most of the growth near both ends of the corridor.
- US-85 – decrease of 14% (7,600 jobs), mostly north of SH-60.

In the planning horizon, population differences north of E-470 between 2030 and 2035 within the 2-mile buffer of all three major corridors are much more moderate:

- I-25 – overall population projections in the corridor are lower by a minor amount (1%), but shifts in the allocation of the population are observed, with increases between SH-14 and SH-119 and decreases at the ends of the corridor.
- US-287 – overall increase in the population projection of 1% (4,400 people), with most of the growth north of SH-60.
- US-85 – overall increase in the population projection of 11% (15,600 people), with a 46% higher projection south of SH-119 and a 15% lower projection north of SH-60.

In the planning horizon, employment differences north of E-470 between 2030 and 2035 display similar patterns as the base year, but again are more moderate:

- I-25 – overall employment projections in the corridor are higher by 17% (23,500 jobs), with substantially higher projections south of SH-60.
- US-287 – overall increase in the employment projection of 2% (3,000 jobs).
- US-85 – overall decrease in the employment projection of 6% (4,000 jobs); however, the projections are higher in 2035 south of SH-60.

Overall, within the 2-mile buffers north of E-470, growth is still projected to occur between 2005 and 2035 in all three corridors, but at different rates:

- I-25 – population is projected to increase by 300%, compared to the DEIS projection of 750%. Employment is projected to increase by 430%, compared to the DEIS projection of 450%.

- US-287 – population is projected to increase by 34%, compared to the DEIS projection of 46%. Employment is projected to increase by 18%, compared to the DEIS projection of 26%.
- US-85 – population is projected to increase by 65%, compared to the DEIS projection of 57%. Employment is projected to increase by 26%, compared to the DEIS projection of 38%.

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| NI25 Centerline | | | | | | | | | | | | | | | | | | |
|---------------------|----------------|---------------|---------------|---------------|---------------|---------------|--------------|-------------|--------------|------------|---------------|---------------|---------------|---------------|--------------|------------|--------------|------------|
| Half Mile Buffer | | | | | | | | | | | | | | | | | | |
| Segment | No. of Parcels | Acres | POP 01 | POP 05 | EMP 01 | EMP 05 | POP 01 TO 05 | Percentage | EMP 01 TO 05 | Percentage | POP 30 | POP 35 | EMP 30 | EMP 35 | POP 30 TO 35 | Percentage | EMP 30 TO 35 | Percentage |
| Wellington to SH 14 | 22 | 5922 | 2009 | 3651 | 1684 | 2236 | 1644 | 82% | 551 | 33% | 7413 | 5967 | 9143 | 8333 | -1443 | -19% | -811 | -9% |
| SH 14 to SH 60 | 56 | 10345 | 1548 | 2159 | 4898 | 5986 | 609 | 39% | 1087 | 22% | 10796 | 10161 | 25945 | 25019 | -641 | -6% | -935 | -4% |
| SH 60 to SH 119 | 15 | 8322 | 747 | 679 | 405 | 713 | -70 | -9% | 309 | 76% | 5645 | 12801 | 3215 | 9796 | 7156 | 127% | 6582 | 205% |
| SH 119 to E470 | 35 | 8115 | 821 | 5003 | 665 | 647 | 4181 | 509% | -18 | -3% | 19141 | 13741 | 22872 | 32767 | -5398 | -28% | 9893 | 43% |
| SUBTOTAL | 128 | 32704 | 5125 | 11492 | 7652 | 9582 | 6364 | 124% | 1929 | 25% | 42995 | 42670 | 61175 | 75915 | -326 | -1% | 14729 | 24% |
| E470 to Denver | 65 | 6951 | 28906 | 32044 | 21603 | 22360 | 3140 | 11% | 760 | 4% | 36770 | 39094 | 54532 | 52318 | 2325 | 6% | -2216 | -4% |
| TOTALS | 193 | 39655 | 34031 | 43536 | 29255 | 31942 | 9504 | 28% | 2689 | 9% | 79765 | 81764 | 115707 | 128233 | 1999 | 3% | 12513 | 11% |
| 2 Mile Buffer | | | | | | | | | | | | | | | | | | |
| Segment | No. of Parcels | Acres | POP 01 | POP 05 | EMP 01 | EMP 05 | POP 01 TO 05 | Percentage | EMP 01 TO 05 | Percentage | POP 30 | POP 35 | EMP 30 | EMP 35 | POP 30 TO 35 | Percentage | EMP 30 TO 35 | Percentage |
| Wellington to SH 14 | 69 | 26698 | 6141 | 10227 | 3701 | 4595 | 4086 | 67% | 895 | 24% | 42030 | 36295 | 17328 | 16092 | -5734 | -14% | -1236 | -7% |
| SH 14 to SH 60 | 127 | 41355 | 11707 | 21252 | 18765 | 22308 | 9542 | 82% | 3547 | 19% | 67898 | 72889 | 68509 | 68984 | 4997 | 7% | 473 | 1% |
| SH 60 to SH 119 | 25 | 31951 | 3681 | 5828 | 1599 | 2554 | 2148 | 58% | 956 | 60% | 16663 | 43678 | 9278 | 25933 | 27018 | 162% | 16656 | 180% |
| SH 119 to E470 | 59 | 33514 | 3142 | 14881 | 1642 | 1503 | 11742 | 374% | -139 | -8% | 83820 | 55673 | 46147 | 53806 | -28147 | -34% | 7658 | 17% |
| SUBTOTAL | 280 | 133518 | 24671 | 52188 | 25707 | 30960 | 27518 | 112% | 5259 | 20% | 210411 | 208535 | 141262 | 164815 | -1866 | -1% | 23551 | 17% |
| E470 to Denver | 154 | 30848 | 153886 | 171690 | 59659 | 60083 | 17806 | 12% | 427 | 1% | 211252 | 220967 | 110666 | 109567 | 9718 | 5% | -1095 | -1% |
| TOTALS | 434 | 164366 | 178557 | 223878 | 85366 | 91043 | 45324 | 25% | 5686 | 7% | 421663 | 429502 | 251928 | 274382 | 7852 | 2% | 22456 | 9% |
| 4 Mile Buffer | | | | | | | | | | | | | | | | | | |
| Segment | No. of Parcels | Acres | POP 01 | POP 05 | EMP 01 | EMP 05 | POP 01 TO 05 | Percentage | EMP 01 TO 05 | Percentage | POP 30 | POP 35 | EMP 30 | EMP 35 | POP 30 TO 35 | Percentage | EMP 30 TO 35 | Percentage |
| Wellington to SH 14 | 114 | 59911 | 16068 | 21573 | 13687 | 16173 | 5505 | 34% | 2487 | 18% | 64585 | 57278 | 31623 | 30659 | -7309 | -11% | -962 | -3% |
| SH 14 to SH 60 | 231 | 82682 | 66988 | 89325 | 47934 | 59398 | 22338 | 33% | 11468 | 24% | 149639 | 167870 | 110034 | 115253 | 18234 | 12% | 5220 | 5% |
| SH 60 to SH 119 | 56 | 64758 | 10403 | 13517 | 3610 | 4976 | 3110 | 30% | 1365 | 38% | 32754 | 63518 | 13257 | 32970 | 30763 | 94% | 19712 | 149% |
| SH 119 to E470 | 91 | 66754 | 11756 | 29974 | 2930 | 2885 | 18216 | 155% | -46 | -2% | 144374 | 117598 | 54589 | 60974 | -26777 | -19% | 6383 | 12% |
| SUBTOTAL | 492 | 274105 | 105215 | 154389 | 68161 | 83432 | 49169 | 47% | 15274 | 22% | 391352 | 406264 | 209503 | 239856 | 14911 | 4% | 30353 | 14% |
| E470 to Denver | 311 | 68966 | 323469 | 353243 | 129268 | 124150 | 29775 | 9% | -5120 | -4% | 443751 | 468691 | 197096 | 204635 | 24936 | 6% | 7537 | 4% |
| TOTALS | 803 | 343071 | 428684 | 507632 | 197429 | 207582 | 78944 | 18% | 10154 | 5% | 835103 | 874955 | 406599 | 444491 | 39847 | 5% | 37890 | 9% |

| US 287 Centerline | | | | | | | | | | | | | | | | | | |
|-------------------|----------------|-------|--------|--------|--------|--------|--------------|------------|--------------|------------|--------|--------|--------|--------|--------------|------------|--------------|------------|
| Half Mile Buffer | | | | | | | | | | | | | | | | | | |
| Segment | No. of Parcels | Acres | POP 01 | POP 05 | EMP 01 | EMP 05 | POP 01 TO 05 | Percentage | EMP 01 TO 05 | Percentage | POP 30 | POP 35 | EMP 30 | EMP 35 | POP 30 TO 35 | Percentage | EMP 30 TO 35 | Percentage |
| SH 14 to SH 60 | 120 | 10940 | 38596 | 44390 | 47406 | 48595 | 5788 | 15% | 1186 | 3% | 55916 | 55093 | 59851 | 55548 | -817 | -1% | -4302 | -7% |
| SH 60 to SH 119 | 45 | 9126 | 21687 | 21556 | 8926 | 9258 | -133 | -1% | 332 | 4% | 26307 | 23332 | 10179 | 11192 | -2972 | -11% | 1014 | 10% |
| SH 119 to E470 | 50 | 9264 | 16357 | 16774 | 8088 | 8894 | 417 | 3% | 803 | 10% | 23467 | 24468 | 10208 | 10508 | 1002 | 4% | 300 | 3% |

| | | | | | | | | | | | | | | | | | | |
|-----------------|----------------|---------------|---------------|---------------|---------------|---------------|--------------|------------|--------------|------------|---------------|---------------|---------------|---------------|--------------|------------|--------------|------------|
| SUBTOTAL | 215 | 29330 | 76640 | 82720 | 64420 | 66747 | 6072 | 8% | 2321 | 4% | 105690 | 102893 | 80238 | 77248 | -2787 | -3% | -2988 | -4% |
| E470 to Denver | 2 | 177 | 1 | 43 | 62 | 18 | 42 | 4200% | -45 | -73% | 56 | 41 | 61 | 18 | -16 | -29% | -44 | -72% |
| TOTALS | 217 | 29507 | 76641 | 82763 | 64482 | 66765 | 6114 | 8% | 2276 | 4% | 105746 | 102934 | 80299 | 77266 | -2803 | -3% | -3032 | -4% |
| 2 Mile Buffer | | | | | | | | | | | | | | | | | | |
| Segment | No. of Parcels | Acres | POP 01 | POP 05 | EMP 01 | EMP 05 | POP 01 TO 05 | Percentage | EMP 01 TO 05 | Percentage | POP 30 | POP 35 | EMP 30 | EMP 35 | POP 30 TO 35 | Percentage | EMP 30 TO 35 | Percentage |
| SH 14 to SH 60 | 258 | 46725 | 145936 | 167876 | 92950 | 101520 | 21940 | 15% | 8568 | 9% | 207360 | 214425 | 117597 | 117319 | 7063 | 3% | -278 | 0% |
| SH 60 to SH 119 | 83 | 36884 | 63433 | 65163 | 22223 | 22600 | 1732 | 3% | 379 | 2% | 81338 | 80845 | 25983 | 28235 | -493 | -1% | 2248 | 9% |
| SH 119 to E470 | 103 | 36052 | 42923 | 44871 | 19252 | 22564 | 1948 | 5% | 3314 | 17% | 80026 | 77899 | 25940 | 26997 | -2131 | -3% | 1061 | 4% |
| SUBTOTAL | 444 | 119661 | 252292 | 277910 | 134425 | 146684 | 25620 | 10% | 12261 | 9% | 368724 | 373169 | 169520 | 172551 | 4439 | 1% | 3031 | 2% |
| E470 to Denver | 20 | 3349 | 7463 | 7764 | 1366 | 1286 | 301 | 4% | -81 | -6% | 7848 | 7735 | 1405 | 1650 | -116 | -1% | 243 | 17% |
| TOTALS | 464 | 123010 | 259755 | 285674 | 135791 | 147970 | 25921 | 10% | 12180 | 9% | 376572 | 380904 | 170925 | 174201 | 4323 | 1% | 3274 | 2% |
| 4 Mile Buffer | | | | | | | | | | | | | | | | | | |
| Segment | No. of Parcels | Acres | POP 01 | POP 05 | EMP 01 | EMP 05 | POP 01 TO 05 | Percentage | EMP 01 TO 05 | Percentage | POP 30 | POP 35 | EMP 30 | EMP 35 | POP 30 TO 35 | Percentage | EMP 30 TO 35 | Percentage |
| SH 14 to SH 60 | 407 | 101741 | 195524 | 234616 | 115604 | 126583 | 39093 | 20% | 10980 | 9% | 336409 | 346097 | 182502 | 169297 | 9689 | 3% | -13206 | -7% |
| SH 60 to SH 119 | 101 | 75885 | 77986 | 84860 | 27330 | 27366 | 6871 | 9% | 38 | 0% | 110148 | 116157 | 35225 | 38620 | 6011 | 5% | 3394 | 10% |
| SH 119 to E470 | 165 | 68268 | 77217 | 82080 | 33663 | 38651 | 4862 | 6% | 4986 | 15% | 150916 | 149202 | 58536 | 60407 | -1711 | -1% | 1875 | 3% |
| SUBTOTAL | 673 | 245894 | 350727 | 401556 | 176597 | 192600 | 50826 | 14% | 16004 | 9% | 597473 | 611456 | 276263 | 268324 | 13989 | 2% | -7937 | -3% |
| E470 to Denver | 67 | 14629 | 38476 | 40307 | 18863 | 25873 | 1830 | 5% | 7014 | 37% | 57099 | 58777 | 32483 | 47128 | 1678 | 3% | 14644 | 45% |
| TOTALS | 740 | 260523 | 389203 | 441863 | 195460 | 218473 | 52656 | 14% | 23018 | 12% | 654572 | 670233 | 308746 | 315452 | 15667 | 2% | 6707 | 2% |

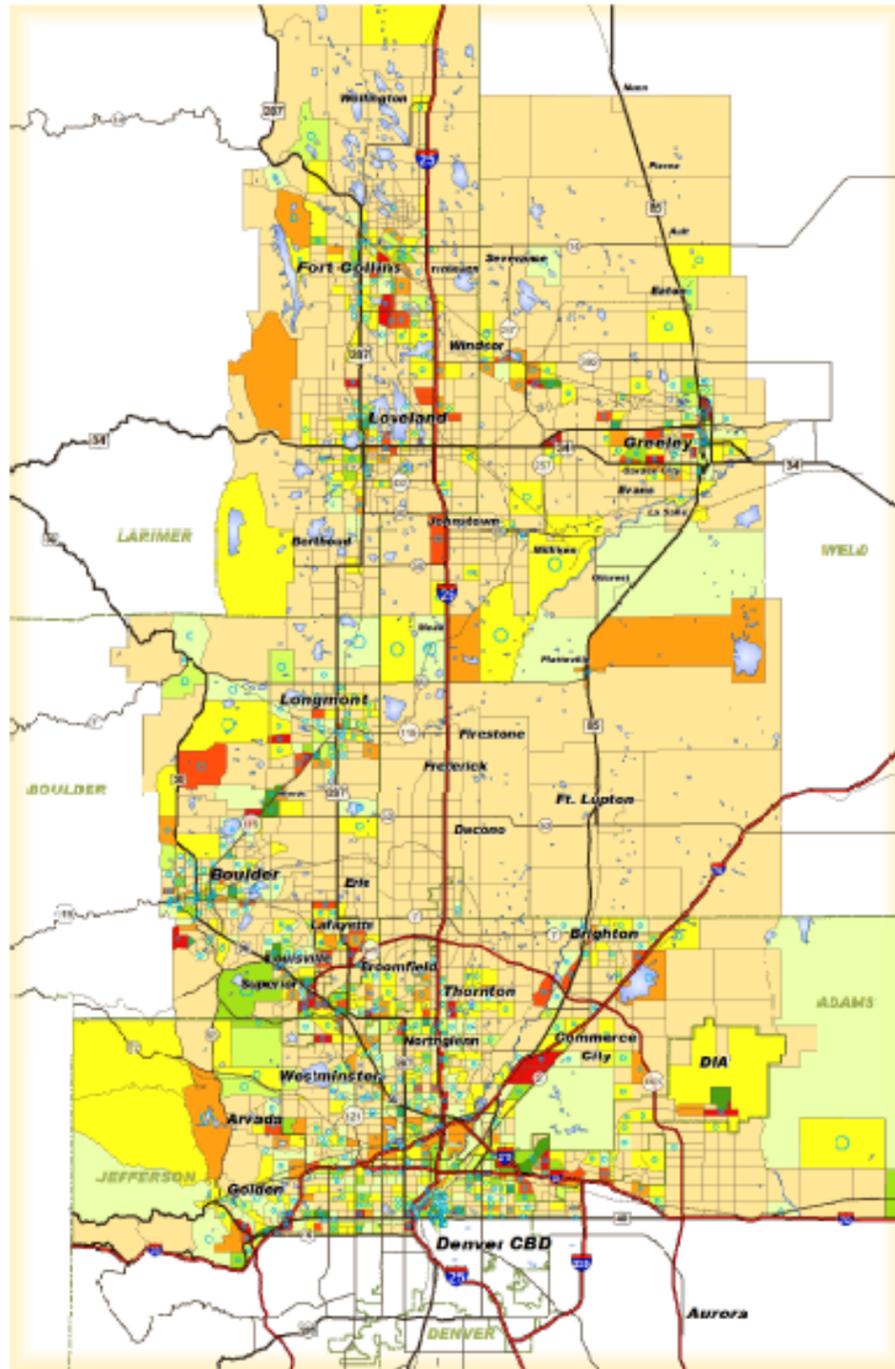
| | | | | | | | | | | | | | | | | | | |
|------------------|----------------|---------------|---------------|---------------|---------------|---------------|--------------|------------|---------------|-------------|---------------|---------------|---------------|---------------|--------------|------------|--------------|-------------|
| US 85 Centerline | | | | | | | | | | | | | | | | | | |
| Half Mile Buffer | | | | | | | | | | | | | | | | | | |
| Segment | No. of Parcels | Acres | POP 01 | POP 05 | EMP 01 | EMP 05 | POP 01 TO 05 | Percentage | EMP 01 TO 05 | Percentage | POP 30 | POP 35 | EMP 30 | EMP 35 | POP 30 TO 35 | Percentage | EMP 30 TO 35 | Percentage |
| Greeley to SH 60 | 36 | 4493 | 18582 | 18804 | 22761 | 13648 | 223 | 1% | -9115 | -40% | 21946 | 19785 | 25739 | 14430 | -2158 | -10% | -11312 | -44% |
| SH 60 to SH 119 | 8 | 9740 | 2546 | 3019 | 704 | 799 | 472 | 19% | 93 | 13% | 3461 | 4028 | 872 | 2110 | 567 | 16% | 1238 | 142% |
| SH 119 to E470 | 25 | 9570 | 8137 | 8614 | 4104 | 4621 | 475 | 6% | 514 | 13% | 13986 | 19378 | 4792 | 7243 | 5392 | 39% | 2452 | 51% |
| SUBTOTAL | 69 | 23803 | 29265 | 30437 | 27569 | 19068 | 1170 | 4% | -8508 | -31% | 39393 | 43191 | 31403 | 23783 | 3801 | 10% | -7622 | -24% |
| E470 to Denver | 48 | 9316 | 7427 | 10250 | 21808 | 20610 | 2825 | 38% | -1203 | -6% | 14734 | 18326 | 24593 | 27803 | 3595 | 24% | 3212 | 13% |
| TOTALS | 117 | 33119 | 36692 | 40687 | 49377 | 39678 | 3995 | 11% | -9711 | -20% | 54127 | 61517 | 55996 | 51586 | 7396 | 14% | -4410 | -8% |
| 2 Mile Buffer | | | | | | | | | | | | | | | | | | |
| Segment | No. of Parcels | Acres | POP 01 | POP 05 | EMP 01 | EMP 05 | POP 01 TO 05 | Percentage | EMP 01 TO 05 | Percentage | POP 30 | POP 35 | EMP 30 | EMP 35 | POP 30 TO 35 | Percentage | EMP 30 TO 35 | Percentage |
| Greeley to SH 60 | 86 | 20850 | 56683 | 59481 | 43689 | 35671 | 2796 | 5% | -8016 | -18% | 75209 | 63878 | 54473 | 38939 | -11336 | -15% | -15534 | -29% |
| SH 60 to SH 119 | 8 | 39041 | 4946 | 5114 | 1421 | 1315 | 171 | 3% | -106 | -7% | 8103 | 8420 | 2106 | 4873 | 316 | 4% | 2767 | 131% |
| SH 119 to E470 | 43 | 37756 | 28055 | 30340 | 9368 | 9881 | 2287 | 8% | 511 | 5% | 57567 | 84181 | 12035 | 20825 | 26617 | 46% | 8793 | 73% |
| SUBTOTAL | 137 | 97647 | 89684 | 94935 | 54478 | 46867 | 5254 | 6% | -7611 | -14% | 140879 | 156479 | 68614 | 64637 | 15597 | 11% | -3974 | -6% |
| E470 to Denver | 176 | 40552 | 115629 | 124662 | 87755 | 83473 | 9035 | 8% | -4285 | -5% | 180524 | 215231 | 124160 | 141213 | 34704 | 19% | 17058 | 14% |
| TOTALS | 313 | 138199 | 205313 | 219597 | 142233 | 130340 | 14289 | 7% | -11896 | -8% | 321403 | 371710 | 192774 | 205850 | 50301 | 16% | 13084 | 7% |
| 4 Mile Buffer | | | | | | | | | | | | | | | | | | |

| Segment | No. of Parcels | Acres | POP 01 | POP 05 | EMP 01 | EMP 05 | POP 01 TO 05 | Percentage | EMP 01 TO 05 | Percentage | POP 30 | POP 35 | EMP 30 | EMP 35 | POP 30 TO 35 | Percentage | EMP 30 TO 35 | Percentage |
|------------------|----------------|---------------|---------------|---------------|---------------|---------------|--------------|------------|---------------|-------------|---------------|---------------|---------------|---------------|--------------|------------|--------------|------------|
| Greeley to SH 60 | 129 | 50100 | 82780 | 91142 | 53509 | 46464 | 8362 | 10% | -7049 | -13% | 127660 | 108978 | 70394 | 52805 | -18684 | -15% | -17591 | -25% |
| SH 60 to SH 119 | 11 | 76966 | 7503 | 7704 | 2052 | 1607 | 199 | 3% | -446 | -22% | 15054 | 14835 | 3492 | 8648 | -219 | -1% | 5156 | 148% |
| SH 119 to E470 | 71 | 75151 | 36377 | 42332 | 11846 | 13224 | 5956 | 16% | 1379 | 12% | 98667 | 142954 | 18368 | 33442 | 44288 | 45% | 15074 | 82% |
| SUBTOTAL | 211 | 202217 | 126660 | 141178 | 67407 | 61295 | 14517 | 11% | -6116 | -9% | 241381 | 266767 | 92254 | 94895 | 25385 | 11% | 2639 | 3% |
| E470 to Denver | 408 | 88600 | 376563 | 403706 | 336254 | 296804 | 27145 | 7% | -39447 | -12% | 539962 | 603515 | 419343 | 445737 | 63552 | 12% | 26391 | 6% |
| TOTALS | 619 | 290817 | 503223 | 544884 | 403661 | 358099 | 41662 | 8% | -45563 | -11% | 781343 | 870282 | 511597 | 540632 | 88937 | 11% | 29030 | 6% |

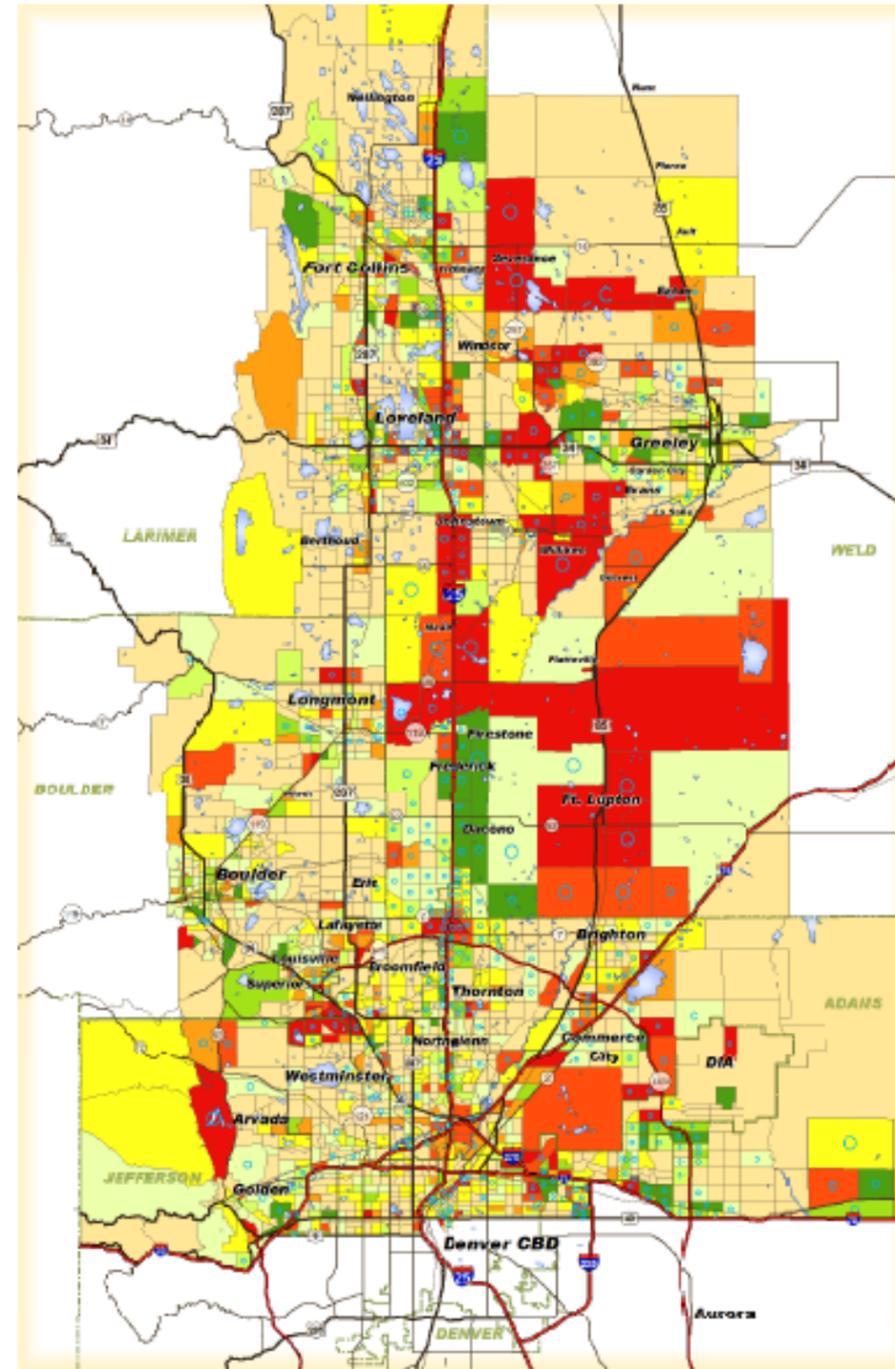
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Employment Projections Analysis (updated 6/10/2009)

Comparison of 2000 and 2005 Employment by TAZ



Comparison of 2030 and 2035 Employment by TAZ



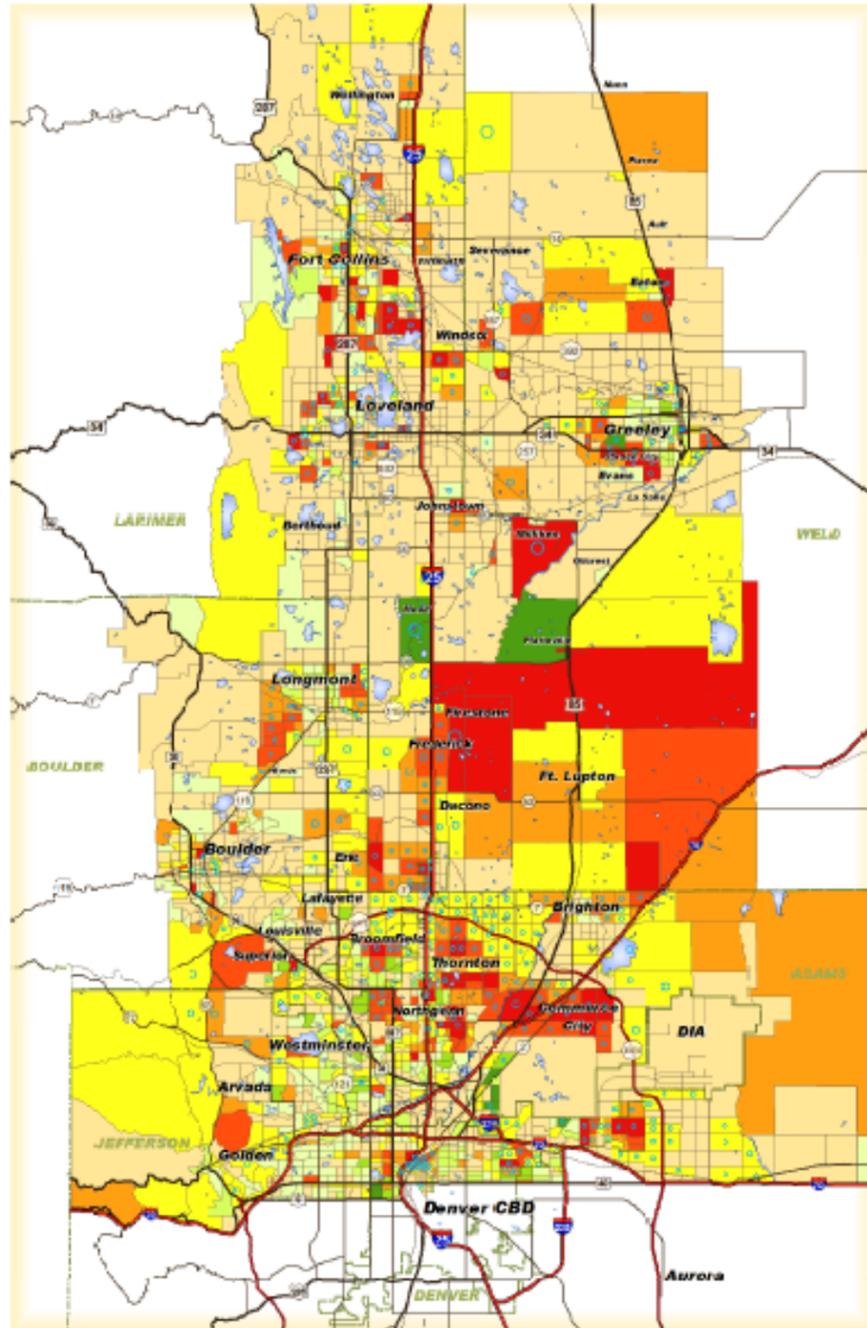
Legend
TAZ difference in Employment
between 2000-05 or 2030-35

- 800 or less
- 799 to -400
- 399 to -200
- 199 to -50
- 49 to +50
- 51 to 200
- 201 to 400
- 401 to 800
- 801 or more

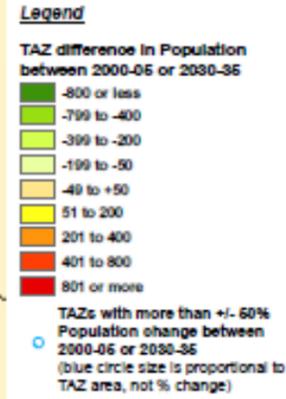
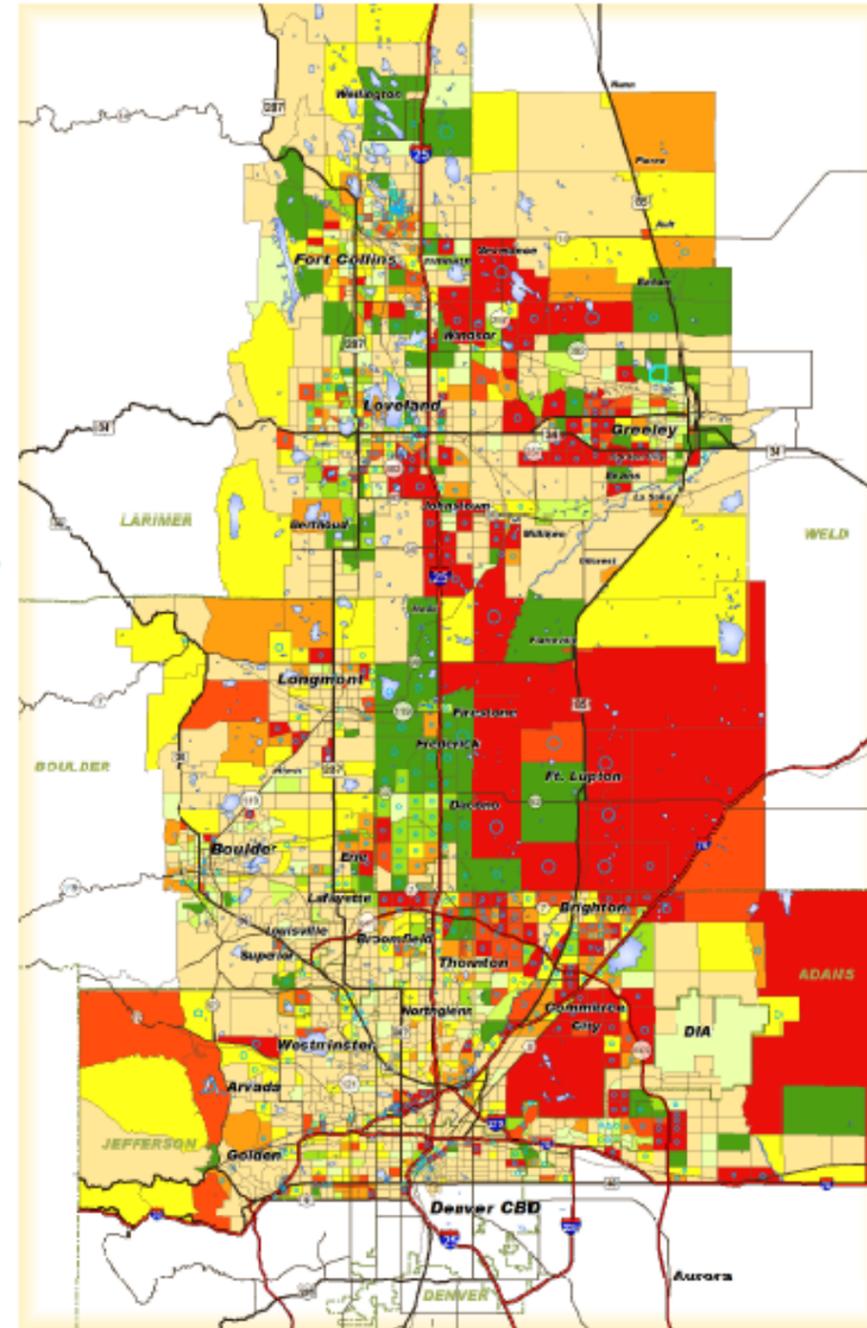
TAZs with more than +/- 60%
Employment change between
2000-05 or 2030-35
(blue circle size is proportional to
TAZ area, not % change)

Population Projections Analysis (updated 6/10/2009)

Comparison of 2000 and 2005 Population by TAZ



Comparison of 2030 and 2035 Population by TAZ



Trip Generation

- Trip Generation by Trip Purpose
 - Comparison of FEIS Travel Model trip rates to DEIS trip rates
 - Comparison of FEIS Travel Model trip rates to NFRMPO and DRCOG trip rates

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Trip Types – 2005 Model

| | Original NFR Model 2005 - ref | | Original DRCOG Model 2005 - ref | NFR+ DRCOG 2005 - ref | Bi Regional 2005 | NFR+ DRCOG+ Bi | Combined Model 2005 |
|---------------------|--|---------------------|--|-----------------------------|------------------------|----------------------|---------------------------|
| Trip Purpose | | Trip Purpose | | | | | |
| HBW | 345,944 | HBW_Li | 102,654 | | 740 | | 169,716 |
| | | HBW_Mi | 1,354,025 | | 4,619 | | 1,570,664 |
| | | HBW_Hi | 598,249 | | 1,888 | | 684,048 |
| Total HBW | 345,944 | Total HBW | 2,054,928 | 2,400,872 | 7,247 | 2,408,119 | 2,424,428 |
| HBS | 334,088 | HNW | 4,779,417 | | | | 5,807,504 |
| HBU | 105,778 | | | | | | |
| HBO | 775,500 | | | | | | |
| Total HNW | 1,215,366 | Total HBNW | 4,779,417 | 5,994,783 | 19,822 | 6,014,605 | 5,807,504 |
| WBO | 223,814 | NHB | 3,215,185 | | | | 3,810,550 |
| OBO | 376,734 | | | | | | |
| Total NHB | 600,548 | Total NHB | 3,215,185 | 3,815,733 | 12,030 | 3,827,763 | 3,810,550 |
| IE | 138,106 | IE | 323,052 | | | | 274,768 |
| Total IE | 138,106 | Total IE | 323,052 | 461,158 | - | 461,158 | 274,768 |
| | | COM | 1,098,889 | | | | 1,103,882 |
| | | Total Com | 1,098,889 | 1,098,889 | 3,468 | 1,102,357 | 1,103,882 |
| EE | 6,983 | EE | 15,404 | | | | 7,653 |

| | | | | | | | |
|-------------|-----------|-------------|------------|------------|--------|------------|------------|
| Total EE | 6,983 | Total EE | 15,404 | 22,387 | - | | 7,653 |
| Grand Total | 2,313,930 | Grand Total | 11,486,875 | 13,793,822 | 42,567 | 13,836,389 | 13,428,785 |

Trip Types – 2035 Model

| | Original NFR Model 2035 - ref | | Original DRCOG Model 2035 - ref | NFR+ DRCOG 2035 - ref | Bi Regional 2035 | NFR+ DRCOG+ Bi | Combined Model 2035 |
|------------------|--|-------------------|--|-----------------------------|------------------------|----------------------|---------------------------|
| Trip Purpose | | Trip Purpose | | | | | |
| HBW | 597,193 | HBW_Li | 172,866 | | 7,501 | | 274,688 |
| | | HBW_Mi | 2,275,569 | | 26,756 | | 2,624,409 |
| | | HBW_Hi | 1,013,876 | | 12,019 | | 1,167,276 |
| Total HBW | 597,193 | Total HBW | 3,462,311 | 4,059,504 | 46,276 | 4,105,780 | 4,066,373 |
| HBS | 577,244 | HNW | 5,807,504 | | | | 8,746,897 |
| HBU | 172,813 | | | | | | |
| HBO | 1,316,522 | | | | | | |
| Total HNW | 2,066,579 | Total HBNW | 5,807,504 | 7,874,083 | 40,531 | 7,914,614 | 8,746,897 |
| WBO | 387,040 | NHB | 3,810,550 | | | | 6,384,756 |
| OBO | 643,056 | | | | | | |
| Total NHB | 1,030,096 | Total NHB | 3,810,550 | 4,840,646 | 25,244 | 4,865,890 | 6,384,756 |
| IE | 263,884 | IE | 274,768 | | | | 629,594 |
| Total IE | 263,884 | Total IE | 274,768 | 538,652 | - | 538,652 | 629,594 |
| | | COM | 1,103,882 | | | | 1,752,215 |
| | | Total Com | 1,103,882 | 1,103,882 | 3,468 | 1,107,350 | 1,752,215 |
| EE | 13,172 | EE | 39,092 | | | | 21,143 |
| Total EE | 13,172 | Total EE | 39,092 | 52,264 | - | 52,264 | 21,143 |

Grand Total 3,970,924

Grand Total 14,498,107

18,469,031

115,519

18,584,550

21,600,978

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Mode Choice

- Mode Choice by Trip Purpose
 - Comparison of FEIS Travel Model trips to DEIS trips
 - Comparison of FEIS Travel Model trips to NFRMPO and DRCOG trips

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Trip Modes – 2005 Model

| | Original NFR Model 2005 - ref | | Original DRCOG Model 2005 - ref | NFR+ DRCOG 2005 - ref | Bi Regional 2005 | NFR+ DRCOG+ Bi | Combined Model 2005 |
|--------------------|--|--------------------|--|-----------------------------|------------------------|----------------------|---------------------------|
| Trip Purpose | | Trip Purpose | | | | | |
| HBW DA | 246,103 | HBW DA | 1,671,117 | | 5,664 | | 1,999,547 |
| HBW SR2 | 56,088 | HBW SR2 | 428,476 | | 1,169 | | 251,746 |
| HBW SR 3 | 26,475 | HBW SR 3 | 241,927 | | 515 | | 81,036 |
| PWL | 1,029 | HBW T-DACC | 34,066 | | 1 | | 29,032 |
| PWE | 0 | HBW T-WACC | 66,285 | | 0 | | 63,066 |
| PWP | 0 | | | | | | |
| PDE | 0 | | | | | | |
| PDP | 0 | | | | | | |
| Total HBW | 329,695 | Total HBW | 2,441,871 | 2,771,566 | 7,349 | 2,778,915 | 2,424,427 |
| HBO | 1,215,366 | HNW DA | 2,048,211 | | 8,488 | | 2,495,510 |
| | | HNW SR2 | 1,546,208 | | 3,247 | | 1,884,822 |
| | | HNW SR3 | 1,114,308 | | 1,350 | | 1,353,820 |
| | | Subtotal Auto | 4,708,727 | | | | 5,734,152 |
| | | HNW T-DACC | 16,137 | | 2 | | 15,699 |
| | | HNW T-WACC | 54,553 | | | | 52,581 |
| Total HNW | 1,215,366 | Total HBNW | 4,779,417 | 5,994,783 | 13,087 | 6,007,870 | 5,802,432 |
| NHB | 600,548 | NHB DA | 1,660,096 | | 6,252 | | 1,970,033 |
| | | NHB SR2 | 897,596 | | 1,690 | | 1,065,176 |
| | | NHB SR3 | 632,221 | | 681 | | 750,258 |
| | | Subtotal Auto | 3,189,913 | | | | |
| | | NHB Transit | 48,538 | | 0 | | 50,505 |
| Total NHB | 600,548 | Total NHB | 3,238,451 | 3,838,999 | 8,623 | 3,847,622 | 3,835,972 |
| Grand Total | 2,145,609 | Grand Total | 10,459,739 | 12,605,348 | 29,059 | 12,634,407 | 12,062,830 |

Trip Modes – 2035 Model

| Original NFR Model | 2035 - ref | Original DRCOG Model | 2035 - ref | 2035 Model | | | Combined Model 2035 No Action |
|--------------------------|------------------|----------------------------|-------------------|-------------------|----------------|----------------------|--|
| | | | | NFR+ DRCOG | Bi Regional | NFR+ DRCOG+ Bi | |
| Trip Purpose | | Trip Purpose | | | | | |
| HBW DA | 425,638 | HBW DA | 2,755,154 | | 11,696 | | 3,270,711 |
| HBW SR2 | 48,493 | HBW SR2 | 362,669 | | 2,436 | | 427,767 |
| HBW SR 3 | 12,908 | HBW SR 3 | 118,183 | | 1,069 | | 140,137 |
| PWL | 1,593 | HBW T-DACC | 88,806 | | 3 | | 89,049 |
| PWE | 0 | HBW T-WACC | 137,498 | | 0 | | 138,708 |
| PWP | 532 | | | | | | |
| PDE | 0 | | | | | | |
| PDP | 537 | | | | | | |
| Total HBW | 489,701 | Total HBW | 3,462,310 | 3,952,011 | 15,204 | 3,967,215 | 4,066,372 |
| HBO | 2,066,579 | HNW DA | 3,158,684 | | 18,878 | | 3,883,355 |
| | | HNW SR2 | 2,261,832 | | 6,640 | | 2,801,370 |
| | | HNW SR3 | 1,578,695 | | 2,622 | | 1,955,882 |
| | | Subtotal Auto | 6,999,211 | | | | 8,640,607 |
| | | HNW T-DACC | 43,686 | | 4 | | 45,244 |
| | | HNW T-WACC | 90,479 | | 0 | | 93,717 |
| Total HNW | 2,066,579 | Total HBNW | 7,133,376 | 9,199,955 | 28,144 | 9,228,099 | 8,779,568 |
| NHB | 1,030,096 | NHB DA | 2,793,024 | | 13,119 | | 3,293,135 |
| | | NHB SR2 | 1,510,160 | | 3,547 | | 1,780,564 |
| | | NHB SR3 | 1,063,679 | | 1,430 | | 1,254,139 |
| | | Subtotal Auto | 5,366,863 | | | | 6,327,838 |
| | | NHB Transit | 107,086 | | 0 | | 108,098 |
| Total NHB | 1,030,096 | Total NHB | 5,473,949 | 6,504,045 | 18,096 | 6,522,141 | 6,435,936 |
| Grand Total | 3,586,376 | Grand Total | 16,069,635 | 19,656,011 | 61,444 | 19,717,455 | 19,281,876 |

Trip Assignment

- Trip Assignment
 - VMT comparisons FEIS to DEIS by alternative
 - VMT comparisons FEIS to NFRMPO and DRCOG
 - I-25 roadway assignments FEIS to DEIS
 - Screenline comparisons FEIS to DEIS and comparison to NFRMPO and DRCOG

2030 DEIS VMT, VHT and Speed Comparison MPO Reference Runs compared to North I-25

| Facility Type | Original NFR 2030 Model Daily VMT | Original DRCOG 2030 Model Daily VMT | Sum of Original DRCOG + NFR 2030 Models Daily VMT | Combined 2030 Model Daily VMT |
|---------------|--------------------------------------|--|--|----------------------------------|
| 1 | 4,933,448 | 41,605,731 | 46,539,179 | 44,465,990 |
| 2 | 2,485,624 | 8,644,479 | 11,130,103 | 10,940,525 |
| 3 | 5,193,803 | 35,543,791 | 40,737,594 | 39,709,444 |
| 4 | 2,883,832 | 7,315,469 | 10,199,301 | 11,068,946 |
| Other | 3,783,639 | 16,293,965 | 20,077,604 | 19,574,557 |
| Total | 19,280,346 | 109,403,435 | 128,683,781 | 125,759,462 |

| Facility Type | Original NFR 2030 Model Daily VHT | Original DRCOG 2030 Model Daily VHT | Sum of Original DRCOG + NFR 2030 Models Daily VHT | Combined 2030 Model Daily VHT |
|---------------|--------------------------------------|--|--|----------------------------------|
| 1 | 81,054 | 900,081 | 981,135 | 948,606 |
| 2 | 47,952 | 244,546 | 292,498 | 294,471 |
| 3 | 151,722 | 1,276,572 | 1,428,294 | 1,473,080 |
| 4 | 92,678 | 319,993 | 412,671 | 478,884 |
| Other | 155,710 | 936,861 | 1,092,571 | 1,141,038 |
| Total | 529,116 | 3,678,053 | 4,207,169 | 4,336,079 |

| Facility Type | Original NFR 2030 Model Daily Avg. Speed | Original DRCOG 2030 Model Daily Avg. Speed | Sum of Original DRCOG + NFR 2030 Models Daily Avg. Speed | Combined 2030 Model Daily Avg. Speed |
|---------------|---|---|---|---|
| 1 | 60.9 | 46.2 | 53.5 | 46.9 |
| 2 | 51.8 | 35.3 | 43.6 | 37.2 |
| 3 | 34.2 | 27.8 | 31.0 | 27.0 |
| 4 | 31.1 | 22.9 | 27.0 | 23.1 |

| | | | | |
|-------|------|------|------|------|
| Other | 24.3 | 17.4 | 20.8 | 17.2 |
| Total | 40.5 | 29.7 | 35.1 | 29.0 |

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**2035 FEIS VMT, VHT and Speed Comparison
MPO Reference Runs compared to North I-25**

| | Original NFR 2035 Model | Original DRCOG 2035 Model | Sum of Original DRCOG + NFR Models 2035 | FEIS Combined Model No Action 2035 |
|---------------|-------------------------|---------------------------|---|------------------------------------|
| Facility Type | VMT | VMT | VMT | VMT |
| 1 | 4,868,403 | 43,384,070 | 48,252,473 | 46,770,429 |
| 2 | 2,787,992 | 9,009,630 | 11,797,622 | 12,343,485 |
| 3 | 4,845,527 | 40,221,133 | 45,066,660 | 44,401,766 |
| 4 | 3,256,303 | 9,294,428 | 12,550,731 | 11,992,092 |
| 5 | 2,316,437 | 6,383,370 | 8,699,807 | 7,614,040 |
| 6 | 144,974 | 1,609,020 | 1,753,994 | 1,695,446 |
| 7 | 280,523 | | 280,523 | |
| 8 | 2,125,158 | 9,276,520 | 11,401,678 | 10,896,098 |
| Total | 20,625,317 | 119,178,171 | 139,803,488 | 135,713,356 |

| Facility Type | VHT | VHT | VHT | VHT |
|---------------|---------|-----------|-----------|-----------|
| 1 | 271,037 | 985,432 | 1,256,469 | 1,023,619 |
| 2 | 65,567 | 275,652 | 341,219 | 347,738 |
| 3 | 147,184 | 1,431,972 | 1,579,156 | 1,610,393 |
| 4 | 111,961 | 402,595 | 514,556 | 507,704 |
| 5 | 83,894 | 384,858 | 468,752 | 449,838 |
| 6 | 9,412 | 63,299 | 72,711 | 67,387 |
| 7 | 11,370 | | 11,370 | |
| 8 | 85,006 | 499,656 | 584,662 | 606,105 |
| Total | 785,431 | 4,043,464 | 4,828,895 | 4,612,784 |

| Facility Type | Avg. Speed | Avg. Speed | Avg. Speed | Avg. Speed |
|---------------|------------|------------|------------|------------|
| 1 | 18 | 44 | 38.4 | 45.7 |
| 2 | 42.5 | 32.7 | 34.6 | 35.5 |
| 3 | 32.9 | 28.1 | 28.5 | 27.6 |
| 4 | 29.1 | 23.1 | 24.4 | 23.6 |
| 5 | 27.6 | 16.6 | 18.6 | 16.9 |
| 6 | 15.4 | 25.4 | 24.1 | 25.2 |
| 7 | 24.7 | | 24.7 | |

| | | | | |
|-------------|------|------|------|------|
| 8 | 25 | 18.6 | 19.5 | 18 |
| Overall Avg | 26.3 | 29.5 | 29.0 | 29.4 |

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Transit Results

- Transit Boarding Comparison
 - Comparison of 2030 DEIS transit boarding and 2035 FEIS boardings by route/mode

Ridership Comparison

| Type | Technology | Route | Description | 2030 DEIS | | 2035 FEIS | |
|---------------|-------------------------------------|----------------|--------------------------------|-----------|--------------|--------------|--------------|
| | | | | A | B | A | B |
| Major Routes | Rail | FC_DUS | Ft. Collins to DUS | 4,320 | | 4,175 | |
| | Comm Bus | Greeley_DUS | Greeley to DUS | 1,120 | | 1,185 | |
| | Comm Bus | GLY_DIA | Greeley to DIA | 419 | | 437 | |
| | BRT | FC_DUS | Ft. Collins to DUS | | 2,872 | | 3,467 |
| | BRT | Greeley_DUS | Greeley to DUS | | 2,623 | | 3,002 |
| | BRT | FC_DIA | Ft. Collins to DIA | | 347 | | 359 |
| | Total Major Route Boardings | | | | 5,859 | 5,843 | 5,797 |
| Feeder Routes | | GRLYFC | Greeley to Ft. Collins | 1,870 | | 1,212 | |
| | | GRLYLVD | Greeley to Loveland | 2,522 | | 2,382 | |
| | | 52FDR | Firestone, Fred., Dacono, Erie | 476 | | 366 | |
| | | MJBFDR | Milliken-Johnstown-Berthoud | 161 | | 243 | |
| | | FTLupton | Ft. Lupton Feeder | | 489 | | 413 |
| | | JnsTwnFdr | Johnstown Feeder | | 496 | | 508 |
| | | LovelandFdr | Loveland Feeder | | 504 | | 463 |
| | | Windsor Feeder | Windsor Feeder | | 74 | | 306 |
| | Total Feeder Route Boardings | | | | 5,030 | 1,564 | 4,203 |

| DRCOG AREA Reference Run 2005 | |
|--|--------------------|
| MODE | Boardings |
| 4 | 65145.9291 |
| 5 | 132271.3014 |
| 6 | 19724.5553 |
| 7 | 21808.752 |
| 8 | 5644.3074 |
| 9 | 31626.0034 |
| 10 | 4849.6024 |
| 11 | 2429.0712 |
| 12 | 18397.6703 |
| Grand Total | 301897.1925 |

| DRCOG AREA Combined Model 2005 | |
|---|------------------|
| MODE | Boardings |
| 4 | 68999.4614 |
| 5 | 146098.8954 |
| 6 | 16415.144 |
| 7 | 18105.6683 |

| | |
|-------------|-------------|
| 8 | 5975.7867 |
| 9 | 33227.9843 |
| 10 | 4413.6574 |
| 11 | 10961.7201 |
| 12 | 23107.7727 |
| Grand Total | 327306.0903 |

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| | Original NFR 2005 Model | Original DRCOG 2005 Model | Sum of Original DRCOG + NFR Models 2005 | FEIS Combined Model 2005 |
|---------------|----------------------------|---------------------------------|---|-----------------------------|
| Facility Type | VMT | VMT | VMT | VMT |
| 1 | 2,869,506 | 25,865,181 | 28,734,687 | 27,161,691 |
| 2 | 1,658,013 | 4,328,941 | 5,986,954 | 5,615,087 |
| 3 | 3,033,703 | 20,656,867 | 23,690,570 | 23,749,189 |
| 4 | 1,776,008 | 7,319,745 | 9,095,753 | 9,223,708 |
| 5 | 1,032,386 | 3,699,346 | 4,731,732 | 4,234,384 |
| 6 | 50,139 | 1,026,647 | 1,076,786 | 33,377 |
| 7 | 80,440 | | 80,440 | |
| 8 | 1,060,761 | 5,121,868 | 6,182,629 | 6,060,175 |
| Total | 11,560,956 | 68,018,595 | 79,579,551 | 76,077,611 |

| Facility Type | VHT | VHT | VHT | VHT |
|---------------|---------|-----------|-----------|-----------|
| 1 | 40,556 | 461,816 | 502,372 | 487,352 |
| 2 | 29,637 | 94,014 | 123,651 | 122,271 |
| 3 | 77,139 | 636,655 | 713,794 | 757,718 |
| 4 | 43,712 | 243,977 | 287,689 | 312,267 |
| 5 | 26,778 | 173,184 | 199,962 | 206,547 |
| 6 | 1,847 | 32,916 | 34,763 | 33,377 |
| 7 | 1,517 | | 1,517 | |
| 8 | 42,418 | 272,468 | 314,886 | 336,282 |
| Total | 263,604 | 1,915,030 | 2,178,634 | 2,255,814 |

| Facility Type | Avg. Speed | Avg. Speed | Avg. Speed | Avg. Speed |
|---------------|------------|------------|------------|------------|
| 1 | 70.8 | 56 | 57.2 | 55.7 |
| 2 | 55.9 | 46 | 48.4 | 45.9 |
| 3 | 39.3 | 32.4 | 33.2 | 31.3 |
| 4 | 40.6 | 30 | 31.6 | 29.5 |
| 5 | 38.6 | 21.4 | 23.7 | 20.5 |
| 6 | 27.1 | 31.2 | 31 | 1 |
| 7 | 53 | | 53 | |
| 8 | 25 | 18.8 | 19.6 | 18 |
| Overall Avg | 43.8 | 33.7 | 37.2 | 28.8 |

| | Original NFR 2035 Model | Original DRCOG 2035 Model | Sum of Original DRCOG + NFR Models 2035 | FEIS Combined Model No Action 2035 |
|---------------|----------------------------|---------------------------------|---|--|
| Facility Type | VMT | VMT | VMT | VMT |
| 1 | 4,868,403 | 43,384,070 | 48,252,473 | 46,770,429 |
| 2 | 2,787,992 | 9,009,630 | 11,797,622 | 12,343,485 |
| 3 | 4,845,527 | 40,221,133 | 45,066,660 | 44,401,766 |
| 4 | 3,256,303 | 9,294,428 | 12,550,731 | 11,992,092 |
| 5 | 2,316,437 | 6,383,370 | 8,699,807 | 7,614,040 |
| 6 | 144,974 | 1,609,020 | 1,753,994 | 1,695,446 |
| 7 | 280,523 | | 280,523 | |
| 8 | 2,125,158 | 9,276,520 | 11,401,678 | 10,896,098 |
| Total | 20,625,317 | 119,178,171 | 139,803,488 | 135,713,356 |

| Facility Type | VHT | VHT | VHT | VHT |
|---------------|---------|-----------|-----------|-----------|
| 1 | 271,037 | 985,432 | 1,256,469 | 1,023,619 |
| 2 | 65,567 | 275,652 | 341,219 | 347,738 |
| 3 | 147,184 | 1,431,972 | 1,579,156 | 1,610,393 |
| 4 | 111,961 | 402,595 | 514,556 | 507,704 |
| 5 | 83,894 | 384,858 | 468,752 | 449,838 |
| 6 | 9,412 | 63,299 | 72,711 | 67,387 |
| 7 | 11,370 | | 11,370 | |
| 8 | 85,006 | 499,656 | 584,662 | 606,105 |
| Total | 785,431 | 4,043,464 | 4,828,895 | 4,612,784 |

| Facility Type | Avg. Speed | Avg. Speed | Avg. Speed | Avg. Speed |
|---------------|------------|------------|------------|------------|
| 1 | 18 | 44 | 38.4 | 45.7 |
| 2 | 42.5 | 32.7 | 34.6 | 35.5 |
| 3 | 32.9 | 28.1 | 28.5 | 27.6 |
| 4 | 29.1 | 23.1 | 24.4 | 23.6 |
| 5 | 27.6 | 16.6 | 18.6 | 16.9 |
| 6 | 15.4 | 25.4 | 24.1 | 25.2 |
| 7 | 24.7 | | 24.7 | |
| 8 | 25 | 18.6 | 19.5 | 18 |
| Overall Avg | 26.9 | 26.9 | 26.6 | 27.5 |