



# **Billings Public Schools, Montana**

## **2014 Forecast Accuracy Review & Fall 2014 District-Level Enrollment Forecast Update**

**October 2014**

**Cropper GIS**

**Introduction**

Cropper GIS Consulting (Cropper) performed a demographic study for Billings Public Schools in 2012. The results of the work provided a 10-year population and enrollment forecast for the district, along with a series of assumptions that were assumed to remain constant for the forecasts to track as analyzed.

The forecasts are developed to show what enrollment will become in 10 years if only demographics affect the population. There are certain factors that cannot be accounted for in demographic forecasting, hence assumptions. These can include migration, housing, fertility, and numerous other factors. If the demographic forecasts begin to deviate from actual enrollments, the non-demographic assumptions need to be explored to determine what has changed in the assumptions.

Enrollment data for the 2014 school year was collected from Billings Public Schools, and the enrollment data was evaluated in relation to forecasted enrollment for the 2014 school year. This evaluation gives the demographers and school district an understanding of how accurately the forecasts are tracking to actual enrollment. If a forecast deviates farther than 2% of the total district forecast, it is possible that the assumptions need to be evaluated to determine what is creating the deviation from forecast.

**Forecast Evaluation**

The table to the right compares the October 17, 2014 ADM counts (green column) to the enrollment forecast for 2014, which was performed in 2012 (shown in the blue column). The table indicates that the actual enrollment for 2014 is 366 students lower than what was forecasted for 2014.

The table also indicates that forecasts are tracking higher than actual enrollments that are being reported by 2.3%. The forecast assumptions have been analyzed to determine what is causing actual enrollment to come in lower than forecasted for Billings Public Schools.

**Changes in Assumptions**

The following summarizes findings related to the enrollment vs. forecasts:

A. The 2012 forecast results for the 2014-15 school year were 366 students higher than the actual 2014 ADM enrollment. The majority of the grade level error was concentrated in the elementary grades.

B. Two key assumptions that were made during the calculation of the 2012 series forecasts were violated, causing the forecasts to trend higher than the actual enrollment numbers.

1. The first assumption was that the movement of households to outlying suburban districts would stay at 2010-2012 levels.
  - a. They in fact increased by 300 over the last two years.
2. The second assumption that was violated was that the number of school age children living in the Billings school District that attended private schools would stay constant.
  - a. However over the last two years this number increased by over 200.
  - b. Most of this increase was children that are in the elementary grades.

| Forecast Error by Grade |          |                        |            |                    |
|-------------------------|----------|------------------------|------------|--------------------|
| Grade                   | 2014 ADM | 2012 Forecast for 2014 | Difference | Percent Difference |
| K                       | 1260     | 1350                   | 90         | 7.1%               |
| 1                       | 1291     | 1377                   | 86         | 6.7%               |
| 2                       | 1315     | 1370                   | 55         | 4.2%               |
| 3                       | 1295     | 1318                   | 23         | 1.8%               |
| 4                       | 1173     | 1232                   | 59         | 5.0%               |
| 5                       | 1211     | 1263                   | 52         | 4.3%               |
| 6                       | 1196     | 1233                   | 37         | 3.1%               |
| 7                       | 1223     | 1207                   | -16        | -1.3%              |
| 8                       | 1225     | 1232                   | 7          | 0.6%               |
| 9                       | 1348     | 1434                   | 86         | 6.4%               |
| 10                      | 1273     | 1258                   | -15        | -1.2%              |
| 11                      | 1258     | 1144                   | -114       | -9.1%              |
| 12                      | 1197     | 1213                   | 16         | 1.3%               |
| District total          | 16265    | 16631                  | 366        | 2.3%               |

Source: Comparison of 2012 Cropper Enrollment forecast for 2014 to October 17, 2014 Billings Public Schools ADM Counts

**Fall 2014 Forecast Executive Summary**

1. The 2014 series forecasts now reflect the updated proportion of households moving to the suburban areas and the expanded number of children attending private schools. These rates are held at 2014 levels for the life of the forecasts.
2. The total district enrollment is now forecasted to grow from 16,265 in 2014-15 to 17,217 in 2024-25, an increase of 952 students.
3. The total elementary enrollment is forecasted to grow by 208 students from 7,545 in 2014-15 to 7,753 in 2024-25. The total middle school (7-8) enrollment is forecasted to grow by 282 students from 3,644 in 2014-15 to 3,926 in 2024-25. The total high school enrollment is forecasted to grow by 462 students from 5,076 in 2014-15 to 5,538 in 2024-25.
4. The 2014 series forecasts does not include any calculations related to Pre-Kindergarten programs in the district. Any addition or expansion of Pre-Kindergarten programs must be added to the forecast results.

**Fall 2014 Enrollment Forecast**

The following table shows the enrollment forecasts for Billings Public Schools, which were updated in October 2014.

| <b>Billings Public Schools Enrollment Forecasts</b> |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|   | 2010-11      | 2011-12      | 2012-13      | 2013-14      | 2014-15      | 2015-16      | 2016-17      | 2017-18      | 2018-19      | 2019-20      | 2020-21      | 2021-22      | 2022-23      | 2023-24      | 2024-25      |
| <b>K</b>  | 1205         | 1297         | 1321         | 1310         | 1260         | 1271         | 1274         | 1278         | 1283         | 1289         | 1293         | 1296         | 1300         | 1302         | 1308         |
| <b>1</b>  | 1245         | 1233         | 1321         | 1354         | 1291         | 1281         | 1285         | 1288         | 1292         | 1297         | 1302         | 1306         | 1309         | 1313         | 1315         |
| <b>2</b>  | 1226         | 1253         | 1232         | 1305         | 1315         | 1274         | 1264         | 1268         | 1271         | 1275         | 1284         | 1289         | 1293         | 1296         | 1300         |
| <b>3</b>  | 1124         | 1224         | 1249         | 1183         | 1295         | 1303         | 1263         | 1253         | 1257         | 1260         | 1266         | 1275         | 1280         | 1284         | 1287         |
| <b>4</b>  | 1148         | 1152         | 1215         | 1217         | 1173         | 1286         | 1294         | 1254         | 1244         | 1248         | 1252         | 1258         | 1267         | 1272         | 1276         |
| <b>5</b>  | 1114         | 1174         | 1143         | 1191         | 1211         | 1167         | 1280         | 1288         | 1248         | 1238         | 1243         | 1247         | 1253         | 1262         | 1267         |
| <b>Total:<br/>K-5</b>                               | <b>7062</b>  | <b>7333</b>  | <b>7481</b>  | <b>7560</b>  | <b>7545</b>  | <b>7582</b>  | <b>7660</b>  | <b>7629</b>  | <b>7595</b>  | <b>7607</b>  | <b>7640</b>  | <b>7671</b>  | <b>7702</b>  | <b>7729</b>  | <b>7753</b>  |
| <b>6</b>  | 1067         | 1115         | 1172         | 1137         | 1196         | 1207         | 1163         | 1276         | 1284         | 1244         | 1236         | 1241         | 1245         | 1250         | 1259         |
| <b>7</b>  | 1162         | 1149         | 1178         | 1229         | 1223         | 1279         | 1290         | 1243         | 1364         | 1373         | 1334         | 1325         | 1330         | 1335         | 1340         |
| <b>8</b>  | 1138         | 1197         | 1150         | 1172         | 1225         | 1213         | 1269         | 1280         | 1233         | 1353         | 1365         | 1326         | 1317         | 1322         | 1327         |
| <b>Total:<br/>6-8</b>                               | <b>3367</b>  | <b>3461</b>  | <b>3500</b>  | <b>3538</b>  | <b>3644</b>  | <b>3699</b>  | <b>3722</b>  | <b>3799</b>  | <b>3881</b>  | <b>3970</b>  | <b>3935</b>  | <b>3892</b>  | <b>3892</b>  | <b>3907</b>  | <b>3926</b>  |
| <b>9</b>  | 1573         | 1520         | 1381         | 1306         | 1348         | 1384         | 1371         | 1434         | 1446         | 1393         | 1502         | 1515         | 1472         | 1462         | 1467         |
| <b>10</b>   | 1265         | 1337         | 1350         | 1344         | 1273         | 1281         | 1315         | 1302         | 1362         | 1374         | 1323         | 1427         | 1439         | 1398         | 1389         |
| <b>11</b>   | 1171         | 1150         | 1301         | 1266         | 1258         | 1222         | 1230         | 1262         | 1250         | 1308         | 1319         | 1270         | 1370         | 1381         | 1342         |
| <b>12</b>   | 1140         | 1164         | 1207         | 1254         | 1197         | 1220         | 1185         | 1193         | 1224         | 1213         | 1269         | 1279         | 1232         | 1329         | 1340         |
| <b>Total:<br/>9-12</b>                              | <b>5149</b>  | <b>5171</b>  | <b>5239</b>  | <b>5170</b>  | <b>5076</b>  | <b>5107</b>  | <b>5101</b>  | <b>5191</b>  | <b>5282</b>  | <b>5288</b>  | <b>5413</b>  | <b>5491</b>  | <b>5513</b>  | <b>5570</b>  | <b>5538</b>  |
| <b>Total:<br/>K-12</b>                              | <b>15578</b> | <b>15965</b> | <b>16220</b> | <b>16268</b> | <b>16265</b> | <b>16388</b> | <b>16483</b> | <b>16619</b> | <b>16758</b> | <b>16865</b> | <b>16988</b> | <b>17054</b> | <b>17107</b> | <b>17206</b> | <b>17217</b> |

Forecasts developed October 2014

|                                 |
|---------------------------------|
| Green cells are historical data |
| Blue cells are forecasted years |

Fall 2014 Population Forecast

| Billings Public Schools 2014 Population Forecasts |                |       |                |       |                |       |                |
|---|----------------|-------|----------------|-------|----------------|-------|----------------|
| Total   | 2010           |       | 2015           |       | 2020           |       | 2025           |
| 0-4   | 7,525          |       | 7,740          |       | 7,620          |       | 7,560          |
| 5-9   | 6,748          |       | 7,070          |       | 7,260          |       | 7,130          |
| 10-14   | 6,349          |       | 6,680          |       | 7,000          |       | 7,200          |
| 15-19   | 6,594          |       | 6,880          |       | 7,230          |       | 7,560          |
| 20-24   | 7,832          |       | 8,030          |       | 8,370          |       | 8,780          |
| 25-29   | 8,486          |       | 7,520          |       | 7,700          |       | 8,030          |
| 30-34   | 7,168          |       | 8,140          |       | 7,170          |       | 7,340          |
| 35-39   | 6,338          |       | 6,900          |       | 7,860          |       | 6,890          |
| 40-44   | 6,141          |       | 6,130          |       | 6,680          |       | 7,640          |
| 45-49   | 7,383          |       | 6,020          |       | 6,010          |       | 6,550          |
| 50-54   | 8,040          |       | 7,320          |       | 5,980          |       | 5,970          |
| 55-59   | 7,275          |       | 7,930          |       | 7,240          |       | 5,950          |
| 60-64   | 5,914          |       | 7,090          |       | 7,730          |       | 7,080          |
| 65-69   | 4,379          |       | 5,780          |       | 6,890          |       | 7,500          |
| 70-74   | 3,407          |       | 4,190          |       | 5,480          |       | 6,510          |
| 75-79   | 2,900          |       | 3,210          |       | 3,920          |       | 5,120          |
| 80-84   | 2,580          |       | 2,630          |       | 2,900          |       | 3,540          |
| 85+   | 2,798          |       | 2,930          |       | 3,040          |       | 3,230          |
| <b>Total</b>                                      | <b>107,857</b> |       | <b>112,190</b> |       | <b>116,080</b> |       | <b>119,580</b> |
| <b>Median Age</b>                                 | <b>37.5</b>    |       | <b>37.9</b>    |       | <b>38.6</b>    |       | <b>39.5</b>    |
| <b>Births</b>                                     |                | 8,090 |                | 7,970 |                | 7,920 |                |
| <b>Deaths</b>                                     |                | 5,000 |                | 5,350 |                | 5,780 |                |
| <b>Natural Increase</b>                           |                | 3,090 |                | 2,620 |                | 2,140 |                |
| <b>Net Migration</b>                              |                | 1,240 |                | 1,290 |                | 1,330 |                |
| <b>Change</b>                                     |                | 4,330 |                | 3,910 |                | 3,470 |                |

Differences between period Totals may not equal Change due to rounding.

| Billings Public Schools Enrollment Forecasts |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|  | 2010-11      | 2011-12      | 2012-13      | 2013-14      | 2014-15      | 2015-16      | 2016-17      | 2017-18      | 2018-19      | 2019-20      | 2020-21      | 2021-22      | 2022-23      | 2023-24      | 2024-25      |
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Forecasts developed October 2014

Green cells (2014-15 and earlier) are historical data

Blue cells (2015-16 and later) are forecasted years