



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*



# Williston Basin 2012: Projections of Future Employment and Population North Dakota Summary

Dean A. Bangsund

Nancy M. Hodur

**NDSU** AGRIBUSINESS AND  
APPLIED ECONOMICS

North Dakota State University      Fargo, North Dakota 58108

NDSU is an EO/AA University

## Acknowledgements

This report was produced from a larger research project sponsored by the North Dakota Transmission Authority with financial contributions from Basin Electric Power Cooperative and Montana-Dakota Utilities Co. to examine future electrical load growth in the Williston Basin. KLJ was the Engineer and Project Manager on the study. We express our appreciation to the North Dakota Transmission Authority, Basin Electric Power Cooperative, Montana-Dakota Utilities Co., and to KLJ for their support.

Special thanks are extended to the following individuals for their leadership and project management throughout the study.

Sandi Tabor–North Dakota Transmission Authority

Mike Wamboldt–Project Manager, KLJ

Niles Hushka–Chief Executive Officer, KLJ

Karlene Fine–North Dakota Industrial Commission

We would like to acknowledge the following individuals who directly participated in the Power Load Forecast Study for their contributions to the project: Dr. Kegang Ling–Department of Petroleum Engineering, University of North Dakota; Dr. Linda Burbidge–Department of Agribusiness and Applied Economics, North Dakota State University; and Len Davisson, Emily Johnson, Vicki Schneider, Tracy Haag, Mike Seminary, Bob Valeu, Mark Luther, Kayla Shafer, Matt Binder, Trent Howard, Chad Wiedenmeyer, Jeff Price, Aaron Norby–KLJ.

Thanks to Edie Nelson and Norma Ackerson for graphics, tables and document preparation.

KLJ has published a report entitled *Williston Basin Oil and Gas Related Electrical Load Growth Forecast (PF 12)* which contains a comprehensive presentation of the overall study findings. That document is available to the public at <http://www.nd.gov/ndic/>.

The authors assume responsibility for any errors of omission, logic, or otherwise. Any opinions, findings, and conclusions expressed in this publication are those of the authors and do not necessarily reflect the view of the Department of Agribusiness and Applied Economics, North Dakota State University, the North Dakota Transmission Authority, Basin Electric Power Cooperative, Montana-Dakota Utilities Co., or KLJ.

A single copy of this publication is available free of charge. Please address your inquiry to: Norma Ackerson, Department of Agribusiness and Applied Economics, North Dakota State University, PO Box 6050, Fargo, ND 58105-6050, phone (701-231-7441), fax (701-231-7400), or email: [norma.ackersonn@ndsu.edu](mailto:norma.ackersonn@ndsu.edu). This publication is also available electronically at the following web site: <http://ageconsearch.umn.edu/>

Copyright © by Bangsund and Hodur. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided this copyright notice appears on all such copies.

# Table of Contents

	<u>Page</u>
Acknowledgments .....	ii
Study Perspective .....	1
Overview of Study Methods.....	1
Projections.....	2
Outlook for Future Oil Field Development .....	2
Drilling Activities.....	2
Well Counts.....	3
Employment Projections.....	4
Petroleum Sector Employment .....	5
Employment Shifts within the Petroleum Industry .....	6
Temporary and Permanent Workforce in the Petroleum Sector.....	6
Williston, Dickinson, and Minot Regional Employment.....	8
Williston Region.....	10
Minot Region .....	11
Dickinson Region .....	12
Employment Highlights.....	13
Housing Demand .....	13
Key Observations on Forecasts of Housing Demand .....	16
Forecasts of Population Potential.....	17
Key Observations on Forecasts of Population Potential .....	20
County-level Housing Demand and Population Potential.....	21
References .....	21
Appendix A.....	23
Appendix B.....	42

## Study Perspective

The oil boom in western North Dakota is creating issues for governments and businesses trying to manage the growth in employment, demands for infrastructure, and delivery of public services. The struggles associated with planning for the current oil boom are partially rooted in past experience that suggests oil booms are quickly followed by oil busts. Additionally, part of the problem has been due to the speed and magnitude of changes exhibited by the industry and a lack of understanding how this oil boom may be different from past boom/bust cycles. Long-term insights on the magnitude of oil field development and population expectations are critical to providing proper perspective to managing both short-term needs in the Williston Basin, but also in properly allocating sufficient resources to address long-term development.

The research reported here was part of a study to forecast electrical load growth in the Williston Basin. Employment and population forecasts presented in this summary were part of that larger study.

This summary paper highlights projections for North Dakota. While discussion of these projections is presented on a regional basis, county-level estimates for housing demand and population potential are contained in the attached appendices.

## Overview of Study Methods

Population is a key component in planning for future infrastructure needs. Population is usually forecast using standard cohort demographic models; however, due to rapidly changing conditions in the Williston Basin, existing demographic tools are inadequate. Those traditional methods lack data to adjust birth rates and in-migration rates, and those models fail to address the unique characteristics of the current workforce in the Williston Basin.

An alternate method was developed that linked employment to population. Projected employment growth in the Williston Basin was used to estimate future housing demand. Persons-per-household occupancy rates were then used with estimates of future housing demand to estimate population potential.

The overall method(s) used to develop projections of employment and population in the Williston Basin primarily were based on processes and procedures developed in other studies (Bangsund and Hodur 2012, Bangsund et al. 2012). This modeling process translating regional employment forecasts into demand for housing and converting housing demand into potential population also was used in the North Dakota Housing Finance Agency's Statewide Housing Needs Assessment study (Rathge et al. 2012).

# Projections

The following sections highlight projections for oil field development, direct employment in the petroleum industry, and future total employment in the Williston Basin in North Dakota. Employment in the petroleum industry is presented as statewide estimates, while total (petroleum and all other) employment is presented a regional level. Following the description of employment forecasts, housing demand is estimated and discussed at the regional level. The links between housing demand and population are then discussed, along with regional projections of population potential.

While forecasts of housing demand and population potential are described and discussed at the regional level in the following sections, both housing demand and population potential have been estimated at a county level and are presented in tabular form in the attached appendix.

## Outlook for Future Oil Field Development

The scope of future oil field development in the Williston Basin is unknown. Accordingly, three scenarios were developed, based on stakeholders' input, economic expectations, and reservoir characteristics in the Basin. The range of development scenarios provides context to address the uncertainty associated with the rate and extent of future oil field development (KLJ 2012).

*Low:* The basic premise for the low scenario is that economic conditions or overall economic climate are worse than current conditions.

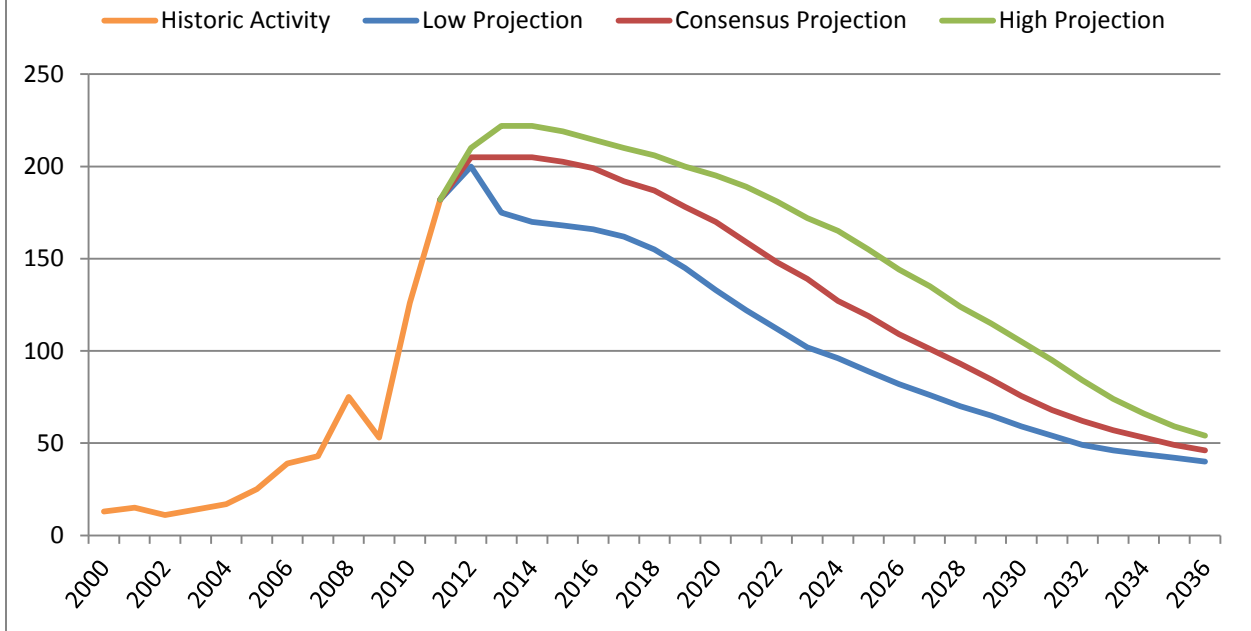
*Consensus:* The consensus scenario was designed around the premise that economic conditions remain relatively similar to those in early 2012.

*High:* The high scenario considers an improved economic climate relative to early 2012.

### Drilling Activities

The number of drilling rigs is an important factor in the rate of oil field development, and has direct implications on employment in the Basin. Rig counts were estimated for North Dakota for the three scenarios (Figure 1). Rig counts increase and eventually peak at 222 in 2014 in the high scenario. The consensus scenario has rig counts peaking at 205 in 2014, while rig counts have already peaked in the low scenario.

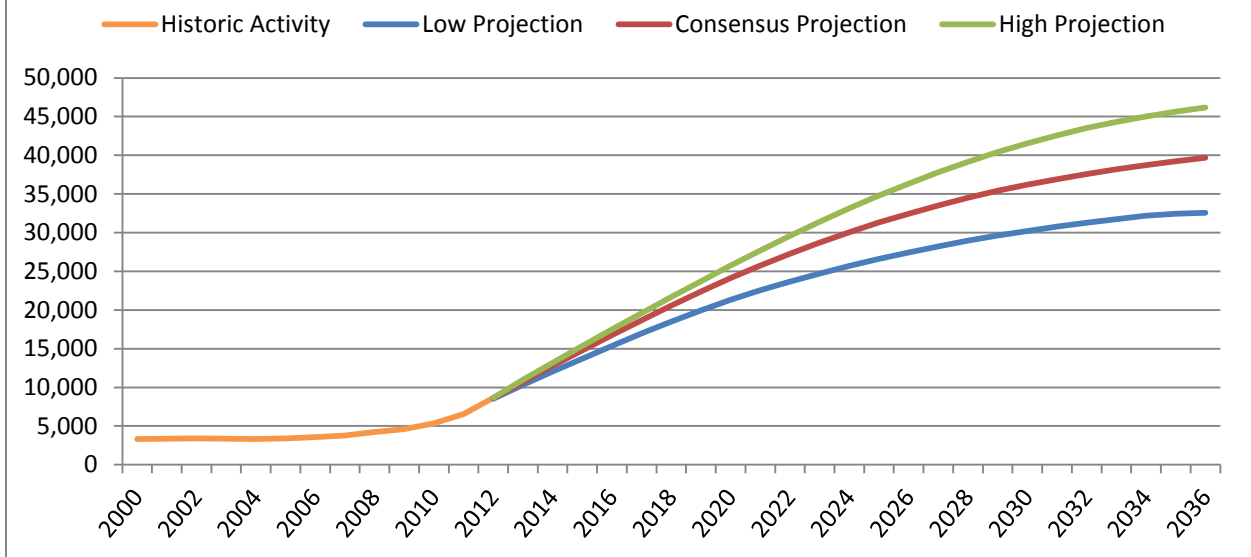
**Figure 1. Rig Counts, North Dakota, 2000 - 2036**



Well Counts

The number of producing oil wells is a key metric to describe the extent or size of oil field development. North Dakota is projected in 2036 to have about 32,500 operating wells in the low scenario, 39,700 operating wells in the consensus scenario, and around 46,200 operating wells in the high scenario (Figure 2).

**Figure 2. Estimated Number of Operating Oil Wells, North Dakota, 2000 - 2036**



## Employment Projections

Employment estimates consist of three main components: direct employment in the oil and gas industry, secondary job creation, and employment in other industries and sectors.

*Petroleum Industry:* Direct employment in the petroleum industry was estimated for drilling, hydraulic fracturing (fracing), construction of in-field gathering systems, and oil field service for each development scenario (for more detail see Bangsund and Hodur 2012).

Employment in the petroleum industry was based on rig counts, well completions, number of existing wells and labor requirements for various aspects of the industry. Separate employment estimates were produced for exploration activities such as drilling and fracing, production operations such as well upkeep, infrastructure maintenance and transportation, and construction of oil field infrastructure and gathering systems. Labor coefficients were adjusted over time to reflect anticipated changes in labor requirements, production practices, and technological efficiencies.

*Secondary Job Creation:* The additional jobs expected to accrue over the projection period in the Williston Basin as a result of expansion of the oil and gas industry were estimated using a variety of methods (see Bangsund and Hodur 2012a). Examples of these jobs include doctors, teachers, mechanics, home builders, sales people, store clerks, accountants, and other jobs in the general economy.

*Other Industries:* Changes in regional employment were evaluated after removing direct employment in the oil and gas industry. Trend analysis of the employment change in remaining industries and economic sectors provided the basis for predicting future employment in non-petroleum related industries.

*Constraints on Employment Growth:* Factors that potentially reduce employment growth (i.e., housing, wages, labor force availability) were included in estimates of base employment and secondary employment [see Bangsund and Hodur (2012a) for a more in-depth discussion on employment constraints].

Workforce characteristics vary based on various oil and gas industry activities. Drilling and fracing, infrastructure construction, and gathering systems' construction largely consist of a [temporary workforce](#). These workers are often residents of other states and work in a location until the job is complete and then move on to the next job site. Temporary workforce also includes shift workers with alternating patterns of working and non-working periods. Even though workers may be onsite or in the state for an extended period, they are viewed as a temporary resident relative to the life cycle of oil field development and are not considered established residents of the state in which they work.

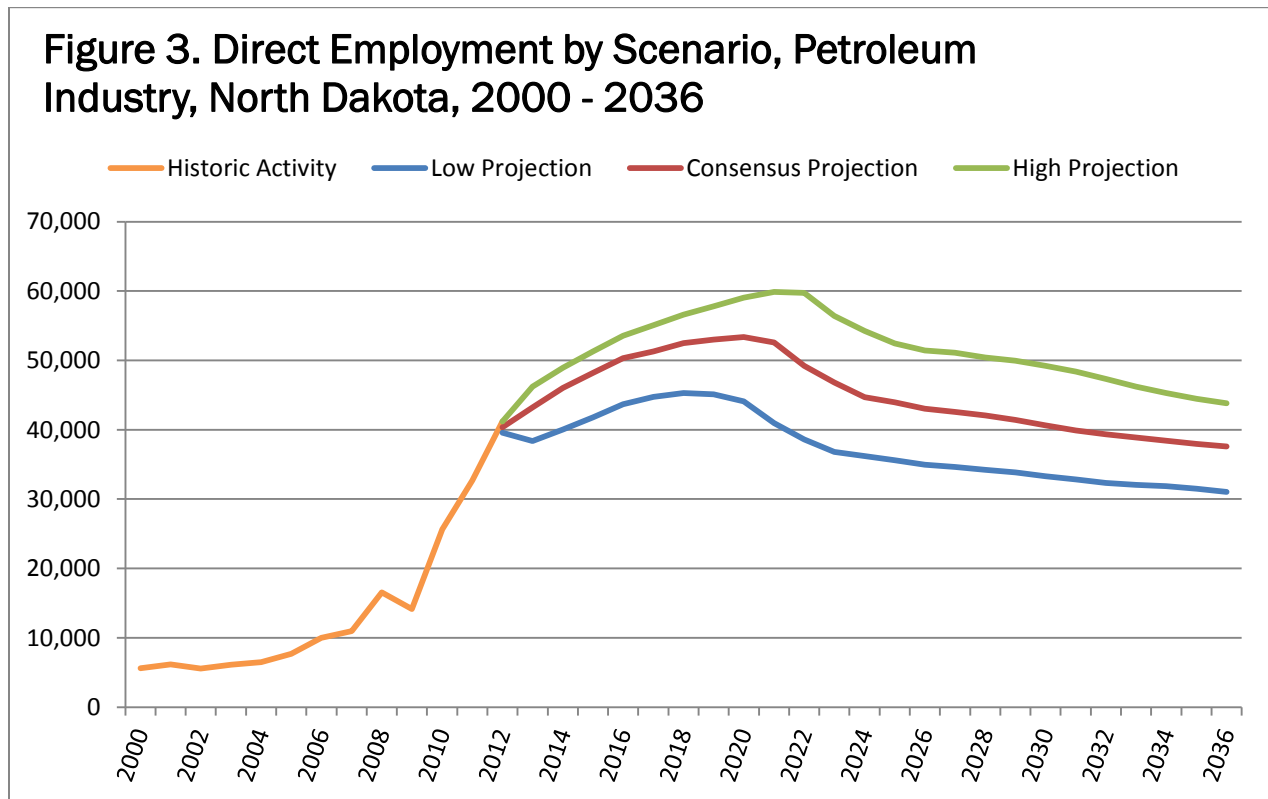
The [permanent workforce](#) is comprised of individuals who work in the Williston Basin and are established permanent residents of North Dakota. Employment for oil field



services is an example of the type of industry activity that consists of a largely permanent workforce. The delineation between permanent and temporary workforces is important as each group of workers has different demands for goods and services, housing, and infrastructure.

### Petroleum Sector Employment

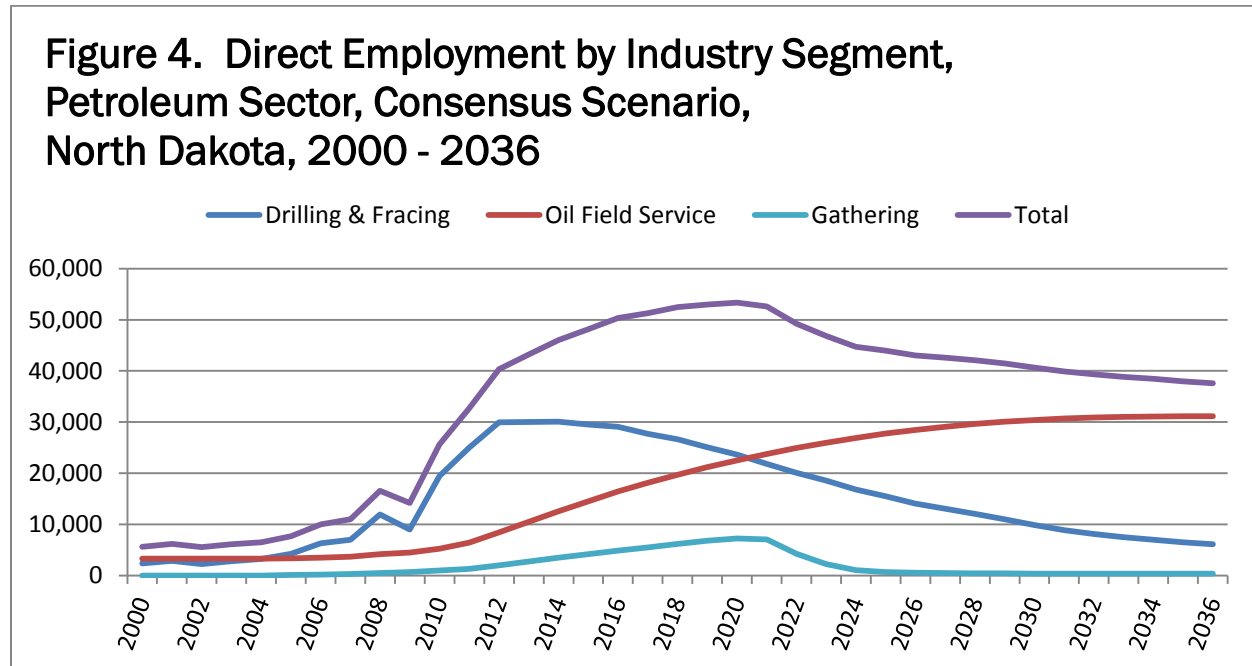
Petroleum sector employment in North Dakota was projected to peak 6 to 12 years in the future, depending upon the rate of future oil field development (Figure 3). Employment associated with constructing oil field gathering systems is expected to substantially contract about midway through the projection period. This assessment is based on the expectation that the gathering systems will be mostly completed after about half of the total wells are finished.



Total employment in the petroleum sector exhibits a sustained declining trend after achieving peak employment due to declining rig counts and labor efficiencies. After labor associated with constructing oil field gathering systems is largely removed from the region, changes in employment within the industry become largely driven by oil field service and well development.

## Employment Shifts within the Petroleum Industry

Employment shifts within the industry occur as near-term increases in employment are primarily due to growth in gathering systems employment, steady employment in drilling and fracing operations, and slowly accumulating employment in oil field service (Figure 4). Towards the end of the planning period, employment in the petroleum sector is largely a function of the number of wells, as employment in drilling and fracing is greatly reduced, and employment in gathering systems construction is mostly removed from the Williston Basin.



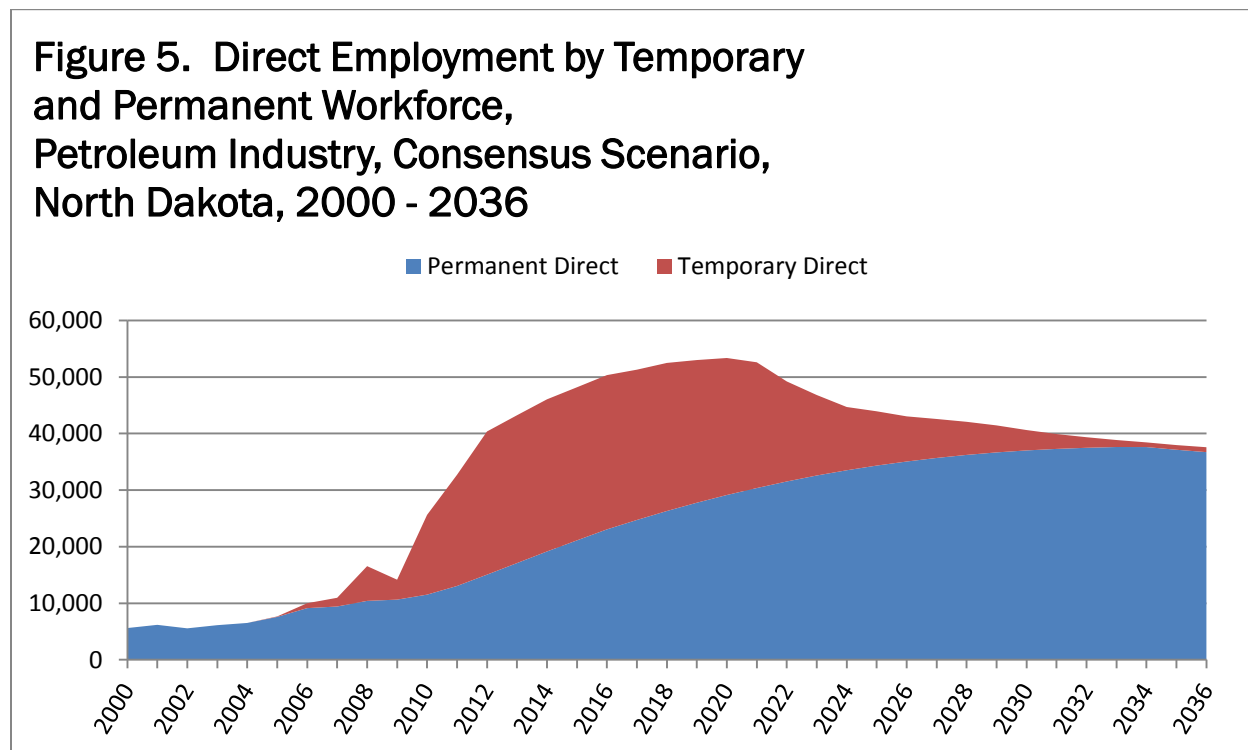
Overall labor in the petroleum sector is modeled to slowly decline over the second half of the projection period. Declining rig counts and reduced labor requirements associated with efficiencies in future drilling operations reduces labor in that segment of the industry. Simultaneously, employment in the oil service segment of the industry increases. Reduction in the decrease in labor for drilling and fracing are slightly greater than the increase in demand for labor for oil field service. The net effect is that employment in the industry slowly decreases. Labor efficiencies associated with oil field service offset some of the employment gains associated with an increase in well counts; this trend contributes to the slow decline in overall employment. While employment grows in the oil service segment of the industry, employment does not grow at a rate proportional to the change in well counts.

## Temporary and Permanent Workforce in the Petroleum Sector

Temporary and permanent workers within various components of the oil and gas industry were delineated separately for drilling, fracing, gathering systems construction, and oil field service. Understanding the future labor characteristics and the implications of a

changing labor dynamic within the industry is critical to identifying and quantifying short-term and long-term labor requirements within the industry. Workforce characteristics also play an important role in estimating secondary employment, and have substantial implications for projecting both short-term and long-term housing needs.

Current employment in the petroleum sector is dominated by a temporary workforce associated with drilling, fracing, and construction of gathering systems within the oil fields. Across all scenarios, temporary workforce peaks at about the same time as total oil and gas employment. Temporary workforce rapidly declines throughout the remainder of the planning period. While the temporary workforce is decreasing, permanent employment, including oil field service employment, is growing. As oil field service employment grows, so do demands for permanent housing and commercial activity. Employment in the petroleum sector is currently dominated by a temporary workforce. However, over the next 20 to 30 years, employment in the industry will transition to a more permanent workforce (Figure 5).



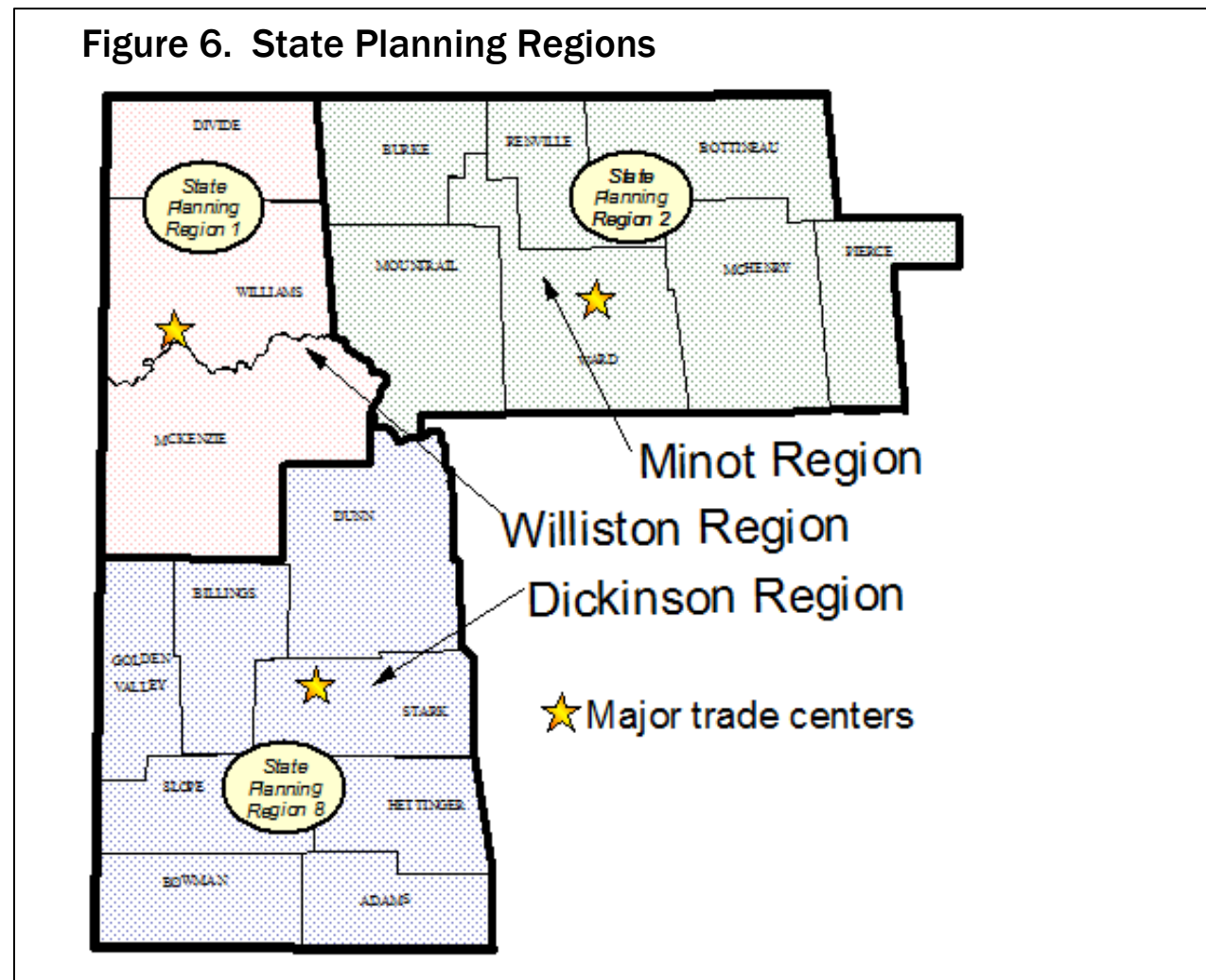
Two salient observations regarding changes in petroleum sector employment in the next several decades are observed. First, across all scenarios, petroleum sector employment peaks and then declines. The second observation is that the composition of employment workforce in the petroleum sector is expected to be much different in the next 20 to 30 years.

While per-well labor requirements to maintain and service future wells are expected to be lower than current requirements, the number of wells and associated activities, such as pipelines and processing plants, will be the driving factor in oil and gas industry

employment. The number of wells in the Williston Basin in all scenarios are considerably higher than current well counts.

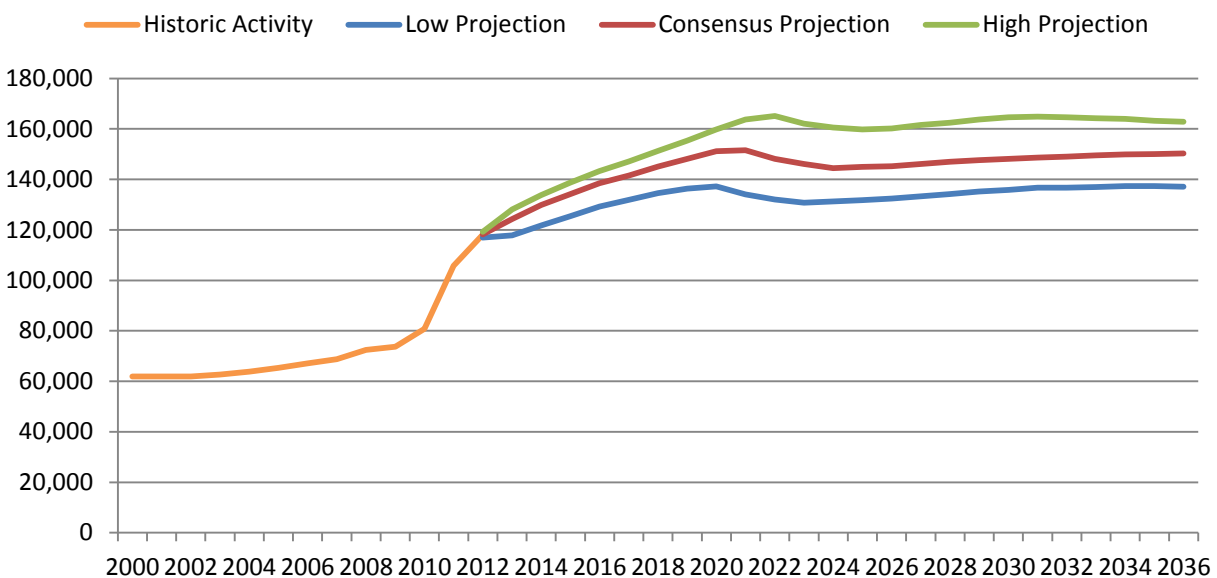
### Williston, Dickinson, and Minot Regional Employment

Total employment in the Williston Basin includes changes in base employment and the change in direct and secondary employment associated with the petroleum sector. Because the effects of employment growth in the petroleum sector differ throughout the Williston Basin, total employment in the North Dakota portion of the Williston Basin was modeled on a regional basis. State Planning Regions 1, 2 and 8, which correspond with the trade areas of Dickinson, Minot, and Williston, provided the geographic scope for employment modeling (Figure 6). Separate estimates of total employment were developed for each region.



Total employment in the North Dakota portion of the Williston Basin continues to increase in the near term (Figure 7) due largely to expansion of petroleum sector employment. Total regional employment is expected to decline shortly after peak employment in the petroleum sector employment, due to an anticipated rapid reduction in construction employment upon completion of oil field gathering systems. However, several factors are expected to contribute to stabilization and subsequent modest growth of overall regional employment in the later stages of the planning period.

**Figure 7. Total Employment,  
(State Planning Regions 1, 2, & 8)  
North Dakota, 2000 - 2036**



The sharp and pronounced employment contraction in the petroleum sector is expected to be associated with temporary construction employment. Removal of a large portion of temporary workforce reduces constraints on housing. Simultaneously, permanent workforce continues to grow, increasing demand for long-term delivery of services and commercial activity.

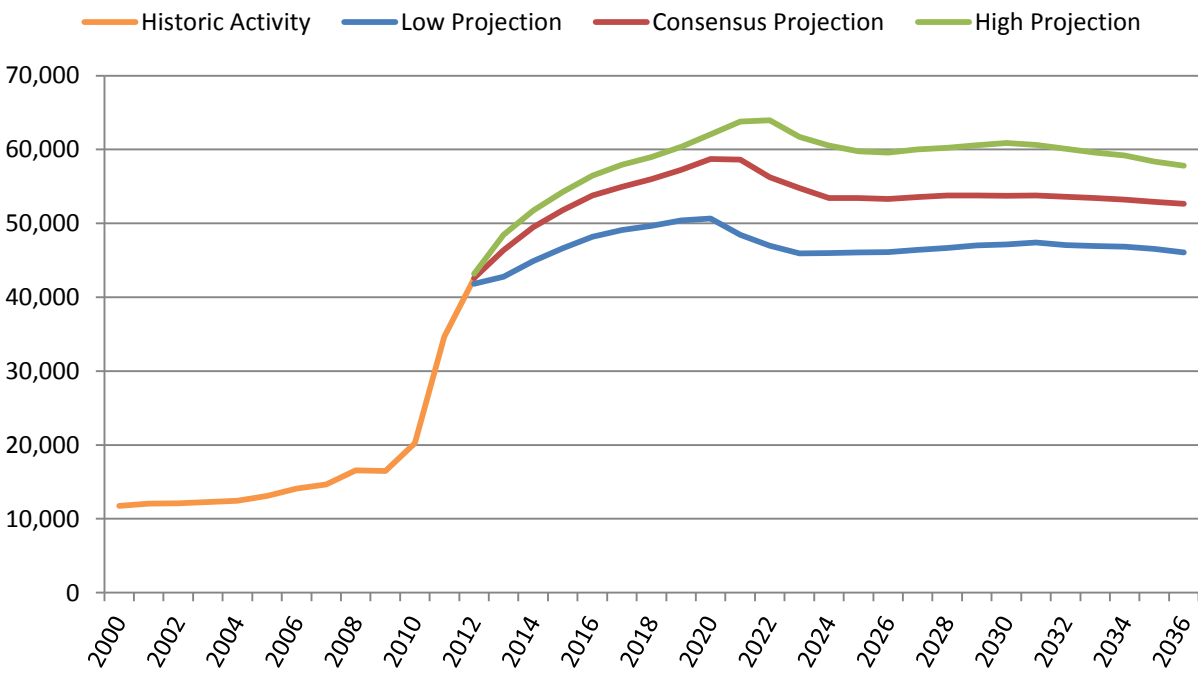
Over the same period, reductions in housing constraints are expected as communities and trade centers have sufficient time to address long-term housing demand allowing the economy in the Williston Basin to begin addressing labor needs for service and commercial operations. Further, with a growing labor force and reductions in housing constraints, constraints on growth in base employment (all other industries) are expected to moderate slightly. All of these dynamic elements of regional employment suggest long-term stabilization of employment in the Williston Basin after an expected contraction in petroleum sector employment.

Despite overall employment in the Williston Basin stabilizing after the contraction in petroleum sector employment, the consequences and effects of employment change in the petroleum sector employment are not equally shared in all regions of the study area.

### Williston Region

The Williston region is the most influenced of all the North Dakota regions by changes in current and expected employment in the Williston Basin (Figure 8). The regional economy currently is extremely sensitive to changes in petroleum sector employment as the industry comprises a considerable share of total employment in the region. Further, the pace of change in total employment in the region has overwhelmed local resources, further straining the regional economy in its ability to add commercial and service employment. In the last four to six years, growth in total employment in the region has been entirely driven by changes in petroleum sector employment. Going forward, expansions or contractions in employment will have immediate effects in the region as base industries appear to be stagnant. Recent changes in near-term employment growth outside of the petroleum sector have been largely attributed to construction of roads, housing, and commercial activity largely tied to oil and gas-related activities.

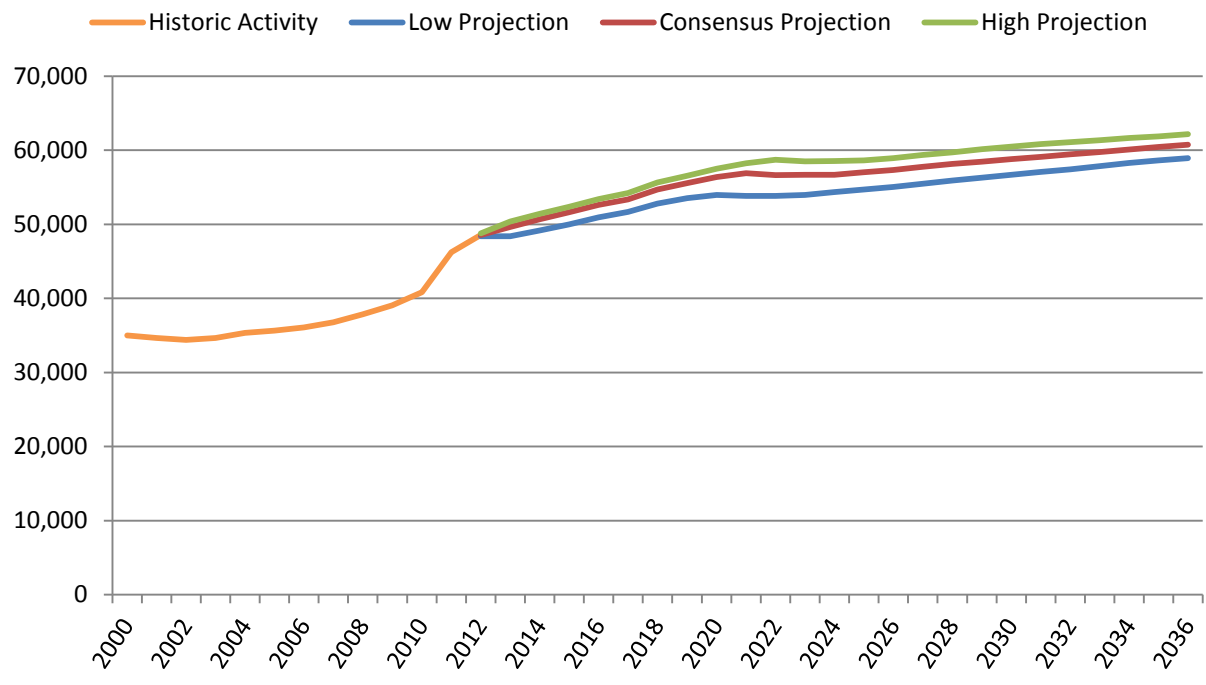
**Figure 8. Total Employment Williston Region, (State Planning Region 1) North Dakota, 2000 - 2036**



## Minot Region

The robust Minot regional economy would likely be the least impacted of all North Dakota regions from substantial changes in petroleum sector employment (Figure 9). While petroleum sector employment represents a growing proportion of regional employment in the Minot area, it is expected to remain a minor component of the overall economy in the future. Changes in employment in base industries in the Minot region show growth without the influences of recent petroleum sector expansion.

**Figure 9. Total Employment Minot Region, (State Planning Region 2) North Dakota, 2000 - 2036**

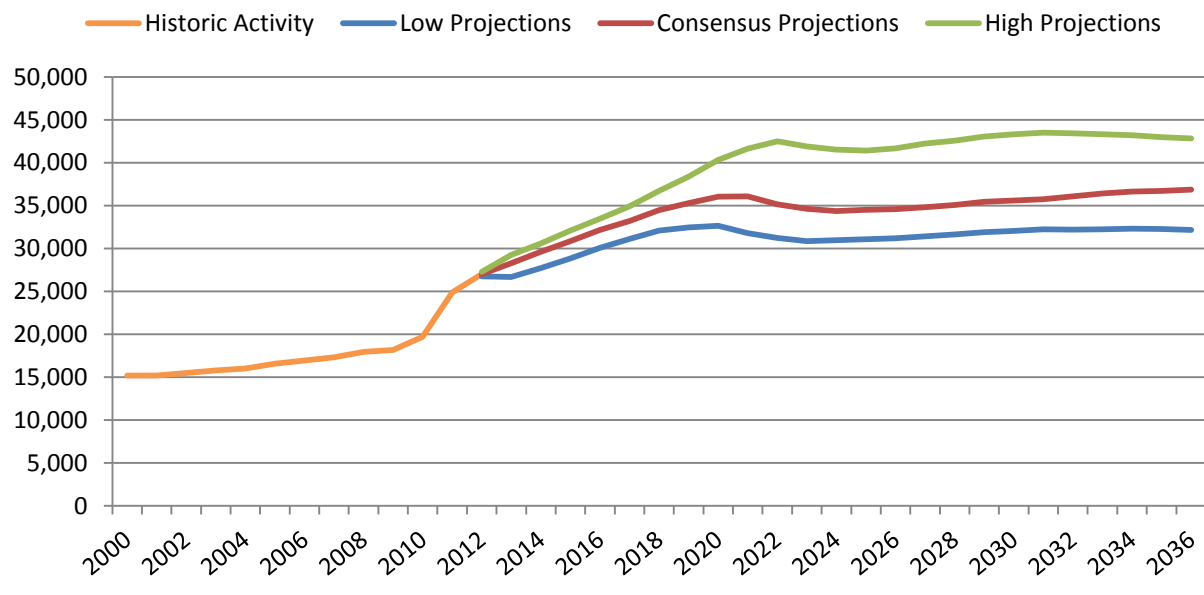


## Dickinson Region

Future effects of petroleum sector employment in the Dickinson region could range from severe to moderate, depending upon the level of future development in the Tyler Formation. Unlike development of the Bakken Formation, which has had the greatest impact in the Williston area, employment and other impacts from the development of the Tyler Formation would disproportionately occur in the Dickinson area. It is expected that continued development in the Three Forks Formation will remain a major factor the Dickinson area economy.

Overall, the current effects of petroleum sector expansion in Dickinson are less than those experienced in the Williston area, but probably greater than the relative impacts in the Minot area (Figure 10). Prior to the current oil boom, the Dickinson regional economy had continued and sustained economic growth. However, future employment in the region is likely to be sensitive to both changes in base employment and changes in petroleum sector employment.

**Figure 10. Total Employment Dickinson Region, (State Planning Region 8) North Dakota 2000 - 2036)**





## Employment Highlights

- Illustrations display employment in the petroleum sector 20+ years remaining at elevated levels compared to employment prior to development of the Bakken/Three Forks Formations. Depending upon the total number of wells in the Williston Basin, employment 20 to 30 years from now is either above, equal to, or only slightly below current overall levels. Regardless of the exact path forward, elevated levels of employment in that industry in the Williston Basin will remain for several decades.
- Influences of current and future petroleum sector employment differ within regional economies in the Williston Basin. Considerable regional variation exists within the study area with respect to the overall economic health and relative influence of petroleum sector employment. Due to the relative differences in the effects of petroleum sector employment in the Williston Basin, expected changes in base industries and secondary job creation also vary within the region.
- Build-out scenarios for oil and gas development largely set the [level of employment](#) in the various study regions. While subtle differences exist in the assumptions on secondary job growth and constrictions on changes in base employment, those factors were not sufficiently different among the scenarios to alter the trends in regional employment. The shape or [pattern of total regional employment](#) over time was shown to be largely similar across all scenarios. The result is due to shifts in employment within the petroleum industry creating a peak and then a subsequent decline, with the pattern also being linked to the fundamental economic factors affecting various regional economies, including constraints on secondary job creation and expectations for change in employment in other industries.

## Housing Demand

Because of the rate of expansion of energy development in the Williston Basin and associated growth in employment, the demand for housing has outstripped supply. Any excess supply of housing has long been absorbed removing elasticity in the housing supply. An inelastic market for housing exists when housing supply fails to keep pace with housing demand and any new demand results in a proportionate increase in supply. Housing demand was modeled using the following steps.

*Estimates of Total Housing Unit Demand:* A model that converts regional employment forecasts to regional demand for housing revealed an increase in one job currently would result in demand for one housing unit in most areas of the Williston Basin. That assumption was relaxed over time as housing supply was expected to grow and more closely equal demand. Total housing demand was based on estimates of future employment, with adjustments for changes in housing supply over time.

*Demand for Housing at the County Level:* In the near term, the overall workforce remains mobile and will respond to the availability of housing; however, in the long term, the workforce will desire housing to be in reasonable proximity to the oilfields. Accordingly, regional demand for housing, based on projected employment, was allocated among Williston Basin counties according to historic regional distributions and recent trends in the distribution of housing units. This effort produced an estimate of total housing demand at the county level. It is possible that the distribution of housing units among cities and counties may change in the future as many communities near oilfield development have yet to formalize long-term housing plans. Until additional data are available, regional housing demand was allocated among individual counties based on historic distributions and emerging trends.

*Housing Mix in Each County:* Recent building trends reveal a disproportionate shift to multi-family units in North Dakota. The future housing mix (i.e., the number of single family versus multi-family homes) in most counties was adjusted to reflect this trend.

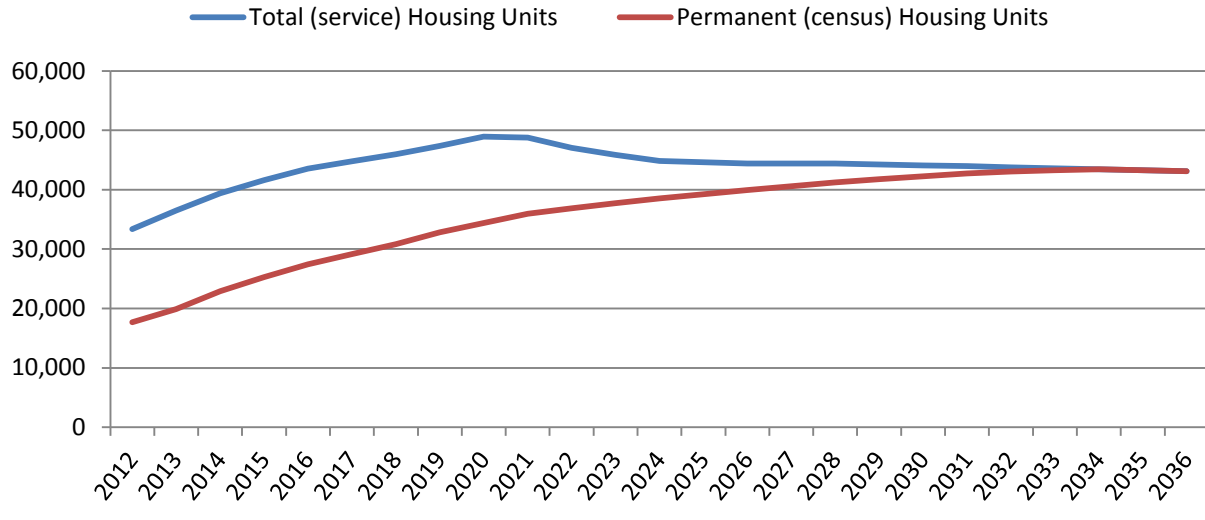
*Housing Demand by Workforce Characteristic:* The employment-to-housing model linked changes in the total workforce (both temporary and permanent workers) to projected demand for housing. That projection produced estimates of total housing demand. The analysis also evaluated housing needs associated with only permanent employment. The two estimates of housing demand help demonstrate the long-term housing needs by showing the importance of including temporary housing in the near term, and planning to provide adequate permanent housing in the long run.

Housing demand was modeled separately for the Dickinson, Minot, and Williston regions. The employment-to-housing model linked changes in the total workforce, both temporary and permanent, to projected demand for housing.

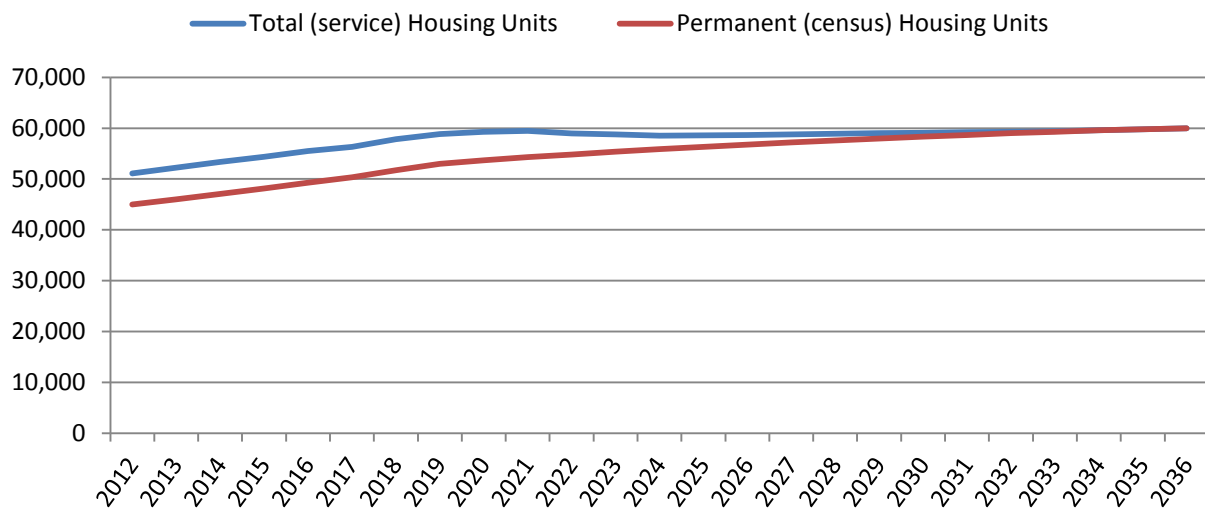
*Total Housing Demand:* Total housing demand includes the needs for both permanent and temporary workers. The analysis shows that total housing demand increases in the near-term and then declines slightly or remains steady over time the petroleum-sector workforce contracts (Figures 11, 12, 13). Substantial levels of temporary housing will be required for over a decade in the Williston Basin.

*Permanent (only) Housing Demand:* Long-term permanent housing demand is projected to increase substantially in all of the scenarios and in all regions. Permanent housing demand is associated with a permanent workforce, and more closely aligns with changes oil field service employment, and expectations for additional service and commercial employment in the future.

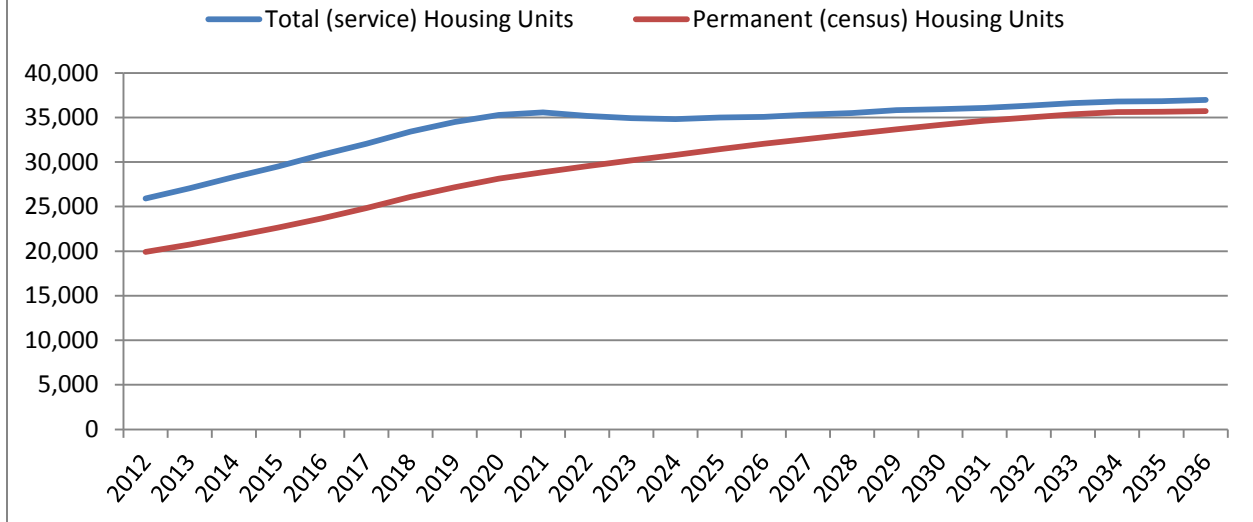
**Figure 11. Demand for Housing (Total Units)  
Consensus Scenario, Williston Region  
(State Planning Region 1), North Dakota, 2012 - 2036**



**Figure 12. Demand for Housing (Total Units)  
Consensus Scenario, Minot Region  
(State Planning Region 2), North Dakota, 2012 - 2036**



**Figure 13. Demand for Housing (Total Units)  
Consensus Scenario, Dickinson Region  
(State Planning Region 8), North Dakota, 2012 - 2036**



Key Observations on Forecasts of Housing Demand:

- Total housing demand (temporary and permanent workers), given current oil field development rates, is not expected to peak until around 2020.
- Housing demand associated with the long-term, permanent workforce is expected to grow almost continually over the next 20 years.
- Supplying adequate housing will present substantial challenges. A conservative estimate using only data from the low scenario for the North Dakota portion of the Williston Basin suggests an additional 45,000 housing units will be needed over the next 20 years.
- Despite an enormous differential between current supply of housing and future projected demand for housing, communities could over build if they attempt to build permanent housing to meet the total housing demand.
- Based on the characteristics of the oil and gas industry workforce, it is imperative that communities include temporary housing as part of their long-term strategy. Temporary housing will be needed, in some capacity, over the next 25 years in nearly all regions of the Williston Basin.
- The lack and cost of housing is currently constraining growth in other sectors of the economy. Expectations for normal economic response for creating secondary employment will not be realized until housing becomes available at prices that

enable additional (service and commercial industries) workers to locate to the region. In addition to constraining secondary job creation, the housing shortage also is constraining existing industries from adding employment. Persistent and acute housing shortages can lead to displacement and crowding out, which have substantial implications for the long-term diversity and economic health of the Williston Basin.

## Forecasts of Population Potential

The final step in estimating the Williston Basin population potential was to apply occupancy rates (i.e., number of people living in a housing unit) by housing type, by county, to convert housing demand into population estimates. Occupancy rates for each type of housing unit by county were based on 2010 Census data. Two population estimates were made to illustrate the unique conditions present in the Williston Basin.

***Permanent Population:*** Permanent population is an estimate of individuals who work in the region and are established residents. Spouses and children of permanent workers living in the region also would be counted as permanent residents. Permanent population also is consistent with population measured by the U.S. Census Bureau. Long-term planning for housing, infrastructure, public and social services and potential public revenue streams should focus on the permanent population.

***Total Population:*** Also called [service population](#), this estimate includes permanent population and temporary population. Temporary population includes individuals not counted by the U.S. Census Bureau who claim residency in other states, work for short durations in the region, do not have permanent addresses in the region or are otherwise associated with short-term employment (relative to the life-span of the oil fields). Incorporating temporary population into an estimate of service population is critical for communities, businesses and government planning requirements since those individuals use and require good and services, both public and private.

***Key Assumptions to Estimating Population Potential:*** This modeling approach relies on several key assumptions. Understanding those conditions is necessary to appropriately interpreting the housing and population forecasts.

- [Ability to Supply Housing](#) – Communities are assumed to be willing and able to supply housing at levels that meet projected demand. Some communities may be more or less inclined or able to supply housing, but on a regional level, the model assumes that housing supply will meet housing demand. While the future supply of housing is unknown, forecasted values represent population potential if housing demand is met.
- [Characteristics of Temporary and Permanent Population are Similar](#) – Temporary population was assumed to have similar characteristics as the permanent population. Current and future temporary workforce

characteristics are unknown. However, it was assumed occupancy rates for temporary workers were similar to occupancy rates for permanent workers.

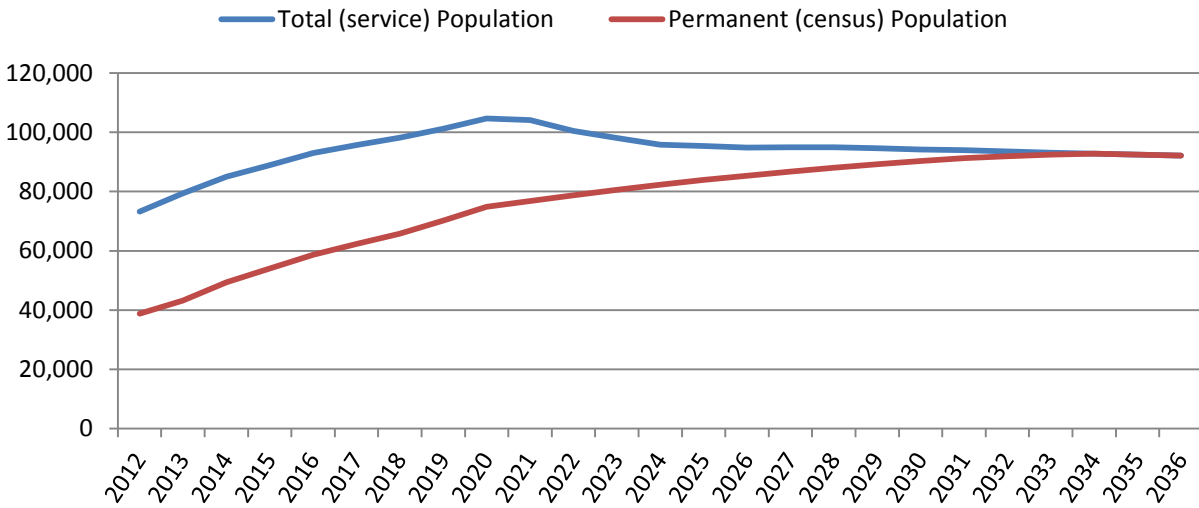
- [Use of Historical Occupancy Rates](#) – Population estimates were made by applying person per household occupancy rates to housing demand estimates for various types of housing units (single family, multi-family). County-level data on occupancy rates for each type of housing were based on 2010 Census data. The severe housing shortage has likely forced higher occupancy rates than historical values, so using historical data may underestimate actual occupancy rates. Unfortunately, no other data was available, so a key assumption in this study was that historical occupancy rates remain valid.

The population projections produced in this study represent *population potential*. As explained in the modeling overview, it is important to understand that the population figures assume that communities are willing and able to supply housing at levels that meet the projected demand, and that occupancy rates and worker demographics are similar to historical Census data.

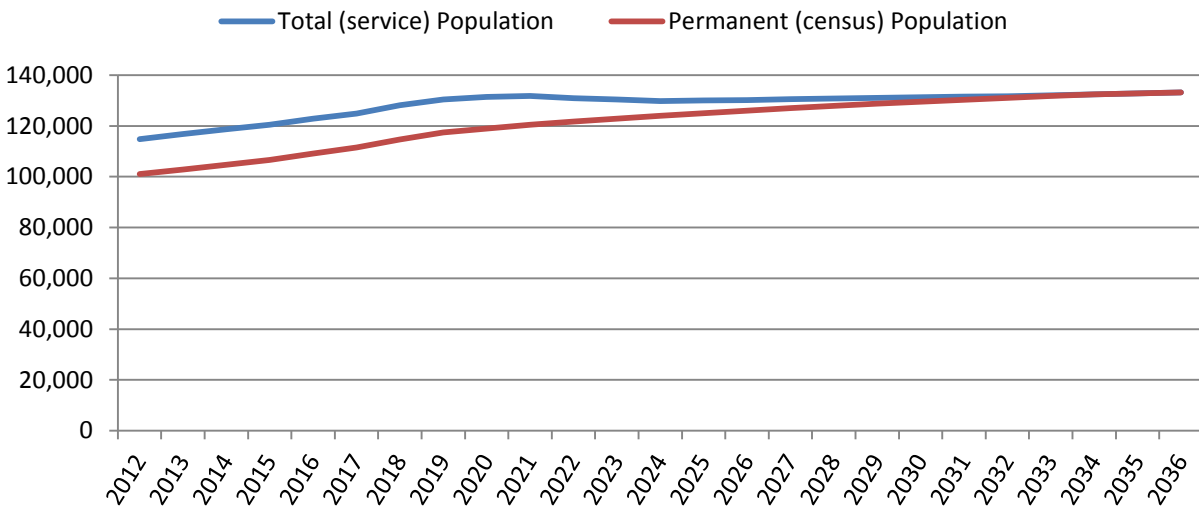
Two population estimates were produced: *permanent population* comprised of individuals who are established residents of the state and *total service population* comprised of established residents and temporary population. Temporary population represents individuals not counted by the U.S. Census Bureau who claim residency in other states, work for short durations in the region, do not have permanent addresses in the region or are otherwise associated with short-term employment or temporary residency.

Depending on the level of oilfield development, service population in the North Dakota portion of the Williston Basin is expected to increase for the next 6 to 12 years. Over the next two decades, service population in the Williston and Minot regions will increase, plateau and then decrease until the point when the service population equals the permanent population (Figures 14 and 15). Service population and permanent population are expected to slowly increase over the study period for the Dickinson region (Figure 16).

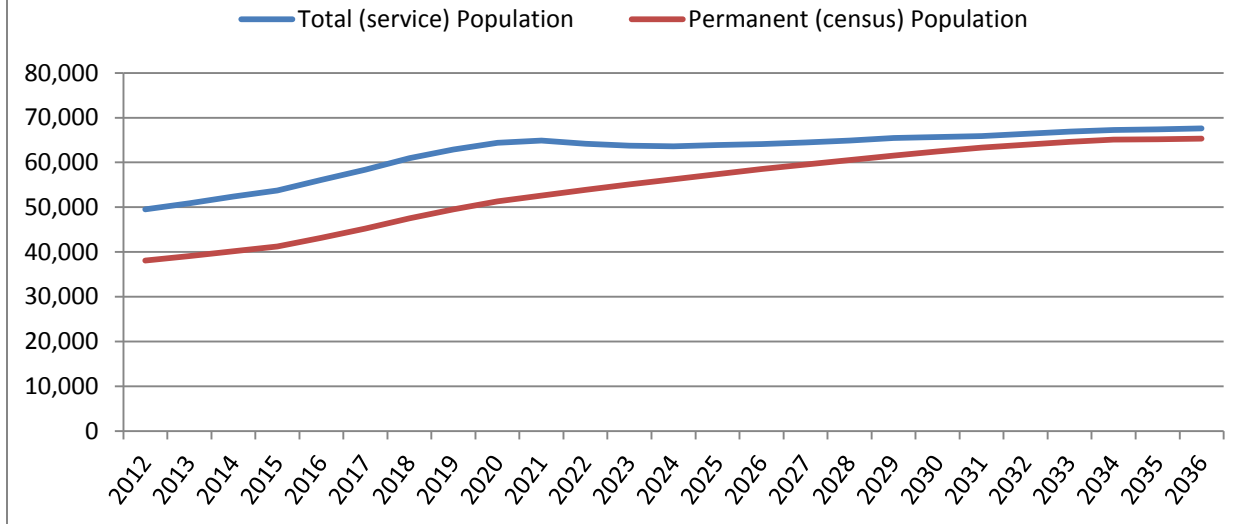
**Figure 14. Population Potential, Consensus Scenario, Williston Region (State Planning Region 1), North Dakota 2012 - 2036**



**Figure 15. Population Potential, Consensus Scenario, Minot Region (State Planning Region 2), North Dakota 2012 - 2036**



**Figure 16. Population Potential, Consensus Scenario, Dickinson Region (State Planning Region 8), North Dakota, 2012 - 2036**



Key Observations on Forecasts of Population Potential:

- Future change in service population was forecasted to be less than the change in permanent population. Based on forecasted changes from 2012 to 2036, service population in the greater Williston Basin was estimated to increase by 12 percent to 27 percent, depending upon development scenario. The modest increase in the service population over the planning period is because growth in the permanent population exceeds the decline in the temporary population.
- If future housing is not provided at a level approaching the forecasted values; population will be less than estimated in this study. Workers will find it difficult to bring family members to the state, or difficult to start families. Accordingly, the region’s population will be skewed towards unaccompanied working adults without spouses and dependents.
- Sensitivity analysis revealed the employment-to-housing-to-population model was responsive to both a change in housing units and occupancy rates. Small changes in either component resulted in large swings in population. A better understanding of workforce characteristics and communities' ability to address future housing needs is needed to refine population projections.
- The Williston Basin lacks a good baseline population estimate. Because the U.S. Census only reports (what is termed in this assessment as) the permanent population, the 2010 Census figures for the Williston Basin undoubtedly underestimated the service population. Incorporating the temporary population into



an estimate of service population is critical for communities, businesses and government planning activities. Even though a portion of the service population are residents of other states, while in the Williston Basin, they still use and require services, both public and private.

## County-level Housing Demand and Population Potential

This study produced forecasted values for housing and population at both regional and county levels. Appendix A provides estimates of the demand for housing expressed in total units. Housing demand, delineated by housing type (e.g., number of single family, apartments, mobile homes), at the county-level is available upon request.

Appendix B provides estimates of permanent and service population potential by county.

## References

- Bangsund, Dean A. and Nancy M. Hodur. 2012. *Modeling Direct and Secondary Employment in the Petroleum Sector in North Dakota*. Agribusiness and Applied Economics Report No. 694, Department of Agribusiness and Applied Economics, North Dakota State University, Fargo.
- Bangsund, Dean A., Nancy M. Hodur, Rich Rathge, and Karen Olson. 2012. *Modeling Employment, Housing, and Population in Western North Dakota: The Case of Dickinson*. Agribusiness and Applied Economics Report No. 695, Department of Agribusiness and Applied Economics, North Dakota State University, Fargo.
- Rathge, Richard, Ramona Danielson, Caitlin Deal, Kendra Erickson, Jennie Lazarus, Karen Olson, Kay Schwarzwalter, and Ashley Wiertzema. 2012. *2012 North Dakota Statewide Housing Needs Assessment: Housing Forecast*. Center for Social Research, North Dakota State University, Fargo, ND.
- KLJ. 2012. *Power Forecast 2012: Williston Basin Oil and Gas Related Electrical Load Growth Forecast (PF 12)*. KLJ, Bismarck, ND.

# **North Dakota County-level Housing Projections and Population Potential**

An Appendix Supplement to

## **Williston Basin 2012: Projections of Future Employment and Population North Dakota Summary**

### **Appendix A – Housing Demand**

The tables in Appendix A represent total demand for housing, by county, by development scenario, for both permanent workforce and total (permanent and temporary) workforce. The tables are organized separately for each of the three study regions. Separate tables for the low, consensus, and high scenario are provided.

### **Appendix B – Population Potential**

The tables in Appendix B represent estimates of the permanent and service populations by county for each region. Permanent populations are designed to closely align with a Census population; whereas, service populations include all people (permanent and temporary workforces). The tables are organized separately for each of the three study regions. Separate tables for the low, consensus, and high scenario are provided.

## Appendix A

Table A1. Housing Demand in Total Units, Low Scenario, by County, State Planning Region 1, 2012 through 2036

Year	State Planning Region 1			Total
	Divide	McKenzie	Williams	
		<u>Permanent Housing<sup>a</sup></u>		
2012	1,557	3,633	12,303	17,493
2013	1,732	4,043	13,691	19,466
2014	2,065	4,820	16,322	23,207
2015	2,250	5,251	17,781	25,282
2016	2,399	5,599	18,961	26,959
2017	2,509	5,856	19,830	28,195
2018	2,602	6,072	20,563	29,238
2019	2,762	6,447	21,832	31,041
2020	2,864	6,683	22,632	32,178
2021	2,927	6,832	23,136	32,895
2022	2,989	6,976	23,622	33,587
2023	3,045	7,108	24,069	34,223
2024	3,099	7,233	24,493	34,825
2025	3,150	7,352	24,897	35,399
2026	3,198	7,464	25,276	35,938
2027	3,243	7,569	25,632	36,444
2028	3,285	7,667	25,964	36,917
2029	3,325	7,760	26,280	37,366
2030	3,363	7,848	26,576	37,786
2031	3,398	7,930	26,853	38,181
2032	3,408	7,953	26,933	38,294
2033	3,416	7,973	26,999	38,388
2034	3,421	7,985	27,041	38,447
2035	3,407	7,952	26,928	38,288
2036	3,387	7,904	26,765	38,055

- continued -

<sup>a</sup>Housing needs associated with permanent workforce.

Table A1. continued

Year	State Planning Region 1			Total
	Divide	McKenzie	Williams	
	<u>Total (Permanent and Temporary) Housing<sup>b</sup></u>			
2012	2,939	6,860	23,230	33,029
2013	3,048	7,114	24,091	34,253
2014	3,271	7,635	25,854	36,760
2015	3,428	8,000	27,092	38,520
2016	3,565	8,321	28,178	40,064
2017	3,649	8,517	28,843	41,010
2018	3,710	8,660	29,325	41,695
2019	3,803	8,876	30,059	42,739
2020	3,799	8,866	30,022	42,687
2021	3,657	8,534	28,900	41,090
2022	3,554	8,294	28,086	39,934
2023	3,480	8,121	27,501	39,102
2024	3,469	8,097	27,420	38,986
2025	3,460	8,074	27,342	38,876
2026	3,450	8,051	27,263	38,764
2027	3,454	8,062	27,302	38,818
2028	3,457	8,067	27,319	38,843
2029	3,463	8,083	27,371	38,917
2030	3,461	8,077	27,350	38,888
2031	3,463	8,081	27,366	38,910
2032	3,440	8,028	27,187	38,655
2033	3,428	8,001	27,094	38,523
2034	3,421	7,985	27,041	38,447
2035	3,407	7,952	26,928	38,288
2036	3,387	7,904	26,765	38,055

<sup>b</sup> Housing demand associated with permanent and temporary workforce.

Table A2. Housing Demand in Total Units, Low Scenario, by County, State Planning Region 2, 2012 through 2036

Year	State Planning Region 2							Total
	Bottineau	Burke	McHenry	Mountrail	Pierce	Renville	Ward	
	Permanent Housing <sup>a</sup>							
2012	4,467	1,368	3,036	4,402	2,255	1,425	27,975	44,928
2013	4,529	1,381	3,080	4,548	2,282	1,444	28,597	45,861
2014	4,592	1,394	3,123	4,697	2,310	1,464	29,232	46,812
2015	4,655	1,407	3,168	4,851	2,337	1,483	29,882	47,783
2016	4,723	1,421	3,215	5,013	2,367	1,504	30,570	48,814
2017	4,785	1,434	3,259	5,174	2,394	1,523	31,237	49,807
2018	4,873	1,454	3,321	5,367	2,433	1,551	32,082	51,081
2019	4,943	1,468	3,370	5,544	2,463	1,572	32,820	52,181
2020	4,966	1,467	3,387	5,671	2,470	1,579	33,253	52,793
2021	5,000	1,474	3,411	5,762	2,484	1,589	33,624	53,344
2022	5,028	1,478	3,430	5,847	2,496	1,598	33,957	53,834
2023	5,053	1,482	3,449	5,930	2,506	1,605	34,279	54,304
2024	5,075	1,485	3,464	6,009	2,514	1,612	34,573	54,732
2025	5,094	1,487	3,478	6,087	2,521	1,618	34,857	55,142
2026	5,112	1,488	3,491	6,163	2,527	1,623	35,132	55,538
2027	5,129	1,489	3,503	6,238	2,533	1,628	35,398	55,918
2028	5,143	1,490	3,514	6,312	2,537	1,632	35,653	56,281
2029	5,157	1,490	3,524	6,385	2,541	1,636	35,904	56,636
2030	5,168	1,489	3,533	6,457	2,544	1,639	36,145	56,976
2031	5,188	1,493	3,547	6,511	2,553	1,645	36,366	57,304
2032	5,207	1,496	3,561	6,564	2,560	1,651	36,579	57,620
2033	5,225	1,500	3,573	6,616	2,568	1,657	36,787	57,926
2034	5,242	1,502	3,585	6,667	2,575	1,662	36,988	58,222
2035	5,252	1,503	3,592	6,709	2,578	1,665	37,138	58,438
2036	5,269	1,508	3,604	6,731	2,587	1,670	37,259	58,628

- continued -

<sup>a</sup>Housing needs associated with permanent workforce.

Table A2. continued

Year	State Planning Region 2							Total
	Bottineau	Burke	McHenry	Mountrail	Pierce	Renville	Ward	
	Total (Permanent and Temporary) Housing <sup>b</sup>							
2012	5,073	1,553	3,448	4,999	2,561	1,618	31,766	51,017
2013	5,062	1,544	3,442	5,083	2,551	1,614	31,963	51,259
2014	5,114	1,553	3,479	5,232	2,573	1,630	32,557	52,137
2015	5,170	1,563	3,518	5,387	2,596	1,647	33,185	53,066
2016	5,233	1,575	3,563	5,556	2,623	1,667	33,877	54,093
2017	5,279	1,582	3,596	5,708	2,641	1,681	34,462	54,948
2018	5,359	1,598	3,652	5,902	2,676	1,705	35,280	56,172
2019	5,400	1,603	3,681	6,056	2,691	1,717	35,851	57,000
2020	5,375	1,588	3,665	6,138	2,673	1,709	35,989	57,137
2021	5,321	1,568	3,630	6,133	2,644	1,691	35,786	56,774
2022	5,278	1,552	3,601	6,138	2,620	1,677	35,649	56,515
2023	5,247	1,539	3,581	6,157	2,602	1,667	35,588	56,379
2024	5,239	1,533	3,576	6,204	2,595	1,664	35,692	56,503
2025	5,231	1,527	3,572	6,250	2,589	1,661	35,793	56,622
2026	5,223	1,521	3,567	6,297	2,582	1,658	35,894	56,742
2027	5,221	1,516	3,567	6,351	2,578	1,657	36,038	56,929
2028	5,218	1,511	3,565	6,404	2,574	1,656	36,172	57,100
2029	5,217	1,507	3,565	6,460	2,571	1,655	36,322	57,296
2030	5,211	1,501	3,562	6,510	2,565	1,653	36,442	57,444
2031	5,216	1,501	3,566	6,546	2,566	1,654	36,562	57,613
2032	5,221	1,500	3,570	6,582	2,567	1,655	36,677	57,773
2033	5,231	1,501	3,577	6,623	2,570	1,658	36,824	57,984
2034	5,242	1,502	3,585	6,667	2,575	1,662	36,988	58,222
2035	5,252	1,503	3,592	6,709	2,578	1,665	37,138	58,438
2036	5,269	1,508	3,604	6,731	2,587	1,670	37,259	58,628

<sup>b</sup> Housing demand associated with permanent and temporary workforce.

Table A3. Housing Demand in Total Units, Low Scenario, by County, State Planning Region 8, 2012 through 2036

State Planning Region 8										
Year	Adams	Billings	Bowman	Dunn	Golden			Slope	Stark	Total
					Valley	Hettinger	Permanent Housing <sup>a</sup>			
2012	1,399	485	1,740	2,217	987	1,445	443	11,200	19,916	
2013	1,437	494	1,803	2,303	1,017	1,488	454	11,657	20,654	
2014	1,486	507	1,880	2,409	1,054	1,542	469	12,211	21,558	
2015	1,535	520	1,960	2,518	1,091	1,598	484	12,785	22,490	
2016	1,589	534	2,047	2,637	1,132	1,659	501	13,414	23,514	
2017	1,642	547	2,134	2,758	1,173	1,719	517	14,049	24,540	
2018	1,699	561	2,229	2,888	1,217	1,784	535	14,737	25,650	
2019	1,743	571	2,309	3,000	1,252	1,836	548	15,332	26,591	
2020	1,764	573	2,358	3,073	1,271	1,864	554	15,731	27,187	
2021	1,780	576	2,391	3,121	1,284	1,884	559	15,988	27,583	
2022	1,796	578	2,424	3,167	1,297	1,903	564	16,240	27,969	
2023	1,809	579	2,454	3,211	1,309	1,921	568	16,476	28,326	
2024	1,821	581	2,482	3,253	1,320	1,937	572	16,706	28,672	
2025	1,833	582	2,511	3,295	1,330	1,953	575	16,935	29,014	
2026	1,844	582	2,538	3,335	1,340	1,967	578	17,155	29,340	
2027	1,853	582	2,564	3,373	1,349	1,981	581	17,366	29,650	
2028	1,862	582	2,588	3,410	1,357	1,993	583	17,570	29,946	
2029	1,869	581	2,611	3,446	1,365	2,004	585	17,767	30,229	
2030	1,876	580	2,633	3,479	1,371	2,015	587	17,956	30,497	
2031	1,886	582	2,655	3,510	1,380	2,028	590	18,120	30,750	
2032	1,888	581	2,664	3,525	1,382	2,031	591	18,204	30,865	
2033	1,889	579	2,672	3,538	1,384	2,034	591	18,281	30,970	
2034	1,889	578	2,679	3,550	1,385	2,036	591	18,348	31,056	
2035	1,882	574	2,676	3,549	1,382	2,031	589	18,350	31,032	
2036	1,879	573	2,671	3,542	1,379	2,027	587	18,315	30,973	

- continued -

<sup>a</sup>Housing needs associated with permanent workforce.



Table A3. continued

State Planning Region 8									
Year	Adams	Billings	Bowman	Dunn	Golden			Stark	Total
					Valley	Hettinger	Slope		
<u>Total (Permanent and Temporary) Housing<sup>b</sup></u>									
2012	1,821	631	2,264	2,884	1,285	1,880	576	14,572	25,912
2013	1,830	630	2,296	2,933	1,295	1,895	578	14,845	26,302
2014	1,886	644	2,387	3,059	1,338	1,958	596	15,505	27,373
2015	1,945	659	2,484	3,191	1,383	2,025	614	16,203	28,503
2016	2,012	676	2,592	3,339	1,434	2,100	634	16,984	29,771
2017	2,068	689	2,688	3,474	1,478	2,165	652	17,696	30,910
2018	2,122	701	2,784	3,608	1,520	2,229	668	18,410	32,043
2019	2,146	703	2,842	3,693	1,542	2,261	675	18,876	32,738
2020	2,128	691	2,845	3,707	1,533	2,249	669	18,980	32,803
2021	2,075	671	2,787	3,637	1,497	2,196	652	18,633	32,147
2022	2,030	653	2,740	3,580	1,467	2,152	638	18,359	31,618
2023	1,992	638	2,703	3,536	1,442	2,116	626	18,148	31,201
2024	1,978	631	2,697	3,533	1,434	2,104	621	18,147	31,145
2025	1,965	623	2,691	3,531	1,426	2,093	616	18,151	31,097
2026	1,951	616	2,685	3,529	1,418	2,082	612	18,152	31,045
2027	1,943	610	2,688	3,537	1,414	2,077	609	18,208	31,087
2028	1,935	605	2,689	3,543	1,410	2,071	606	18,257	31,115
2029	1,928	599	2,693	3,553	1,407	2,067	604	18,322	31,173
2030	1,917	593	2,691	3,556	1,401	2,059	600	18,352	31,170
2031	1,913	590	2,693	3,561	1,400	2,057	599	18,383	31,196
2032	1,901	585	2,683	3,550	1,392	2,046	595	18,335	31,087
2033	1,894	581	2,679	3,548	1,388	2,040	593	18,330	31,053
2034	1,889	578	2,679	3,550	1,385	2,036	591	18,348	31,056
2035	1,882	574	2,676	3,549	1,382	2,031	589	18,350	31,032
2036	1,879	573	2,671	3,542	1,379	2,027	587	18,315	30,973

<sup>b</sup> Housing demand associated with permanent and temporary workforce.

Table A4. Housing Demand in Total Units, Consensus Scenario, by County, State Planning Region 1, 2012 through 2036

Year	State Planning Region 1			Total
	Divide	McKenzie	Williams	
	<u>Permanent Housing<sup>a</sup></u>			
2012	1,574	3,672	12,436	17,682
2013	1,770	4,130	13,986	19,885
2014	2,039	4,758	16,111	22,907
2015	2,250	5,251	17,780	25,281
2016	2,442	5,698	19,296	27,436
2017	2,597	6,061	20,526	29,185
2018	2,742	6,399	21,669	30,809
2019	2,923	6,822	23,102	32,847
2020	3,117	7,275	24,636	35,028
2021	3,201	7,470	25,298	35,969
2022	3,282	7,659	25,935	36,876
2023	3,358	7,837	26,538	37,732
2024	3,427	7,999	27,089	38,515
2025	3,494	8,154	27,614	39,262
2026	3,556	8,298	28,101	39,955
2027	3,613	8,433	28,556	40,602
2028	3,667	8,558	28,982	41,208
2029	3,717	8,674	29,373	41,763
2030	3,762	8,779	29,731	42,272
2031	3,803	8,877	30,060	42,740
2032	3,830	8,939	30,271	43,040
2033	3,853	8,993	30,453	43,298
2034	3,864	9,017	30,535	43,416
2035	3,849	8,983	30,421	43,253
2036	3,838	8,956	30,330	43,124

- continued -

<sup>a</sup>Housing needs associated with permanent workforce.

Table A4. continued

Year	State Planning Region 1			Total
	Divide	McKenzie	Williams	
	<u>Total (Permanent and Temporary) Housing<sup>b</sup></u>			
2012	2,967	6,924	23,449	33,340
2013	3,247	7,577	25,659	36,482
2014	3,508	8,188	27,727	39,423
2015	3,703	8,641	29,264	41,608
2016	3,873	9,040	30,613	43,526
2017	3,987	9,305	31,510	44,802
2018	4,090	9,546	32,326	45,962
2019	4,215	9,836	33,309	47,360
2020	4,357	10,169	34,436	48,962
2021	4,339	10,126	34,289	48,754
2022	4,185	9,767	33,076	47,029
2023	4,083	9,530	32,271	45,884
2024	3,988	9,308	31,522	44,818
2025	3,973	9,272	31,400	44,645
2026	3,951	9,222	31,228	44,401
2027	3,953	9,225	31,239	44,417
2028	3,953	9,226	31,243	44,422
2029	3,939	9,193	31,133	44,265
2030	3,924	9,159	31,015	44,098
2031	3,916	9,139	30,947	44,001
2032	3,895	9,091	30,787	43,774
2033	3,878	9,051	30,651	43,580
2034	3,864	9,017	30,535	43,416
2035	3,849	8,983	30,421	43,253
2036	3,838	8,956	30,330	43,124

<sup>b</sup>Housing demand associated with permanent and temporary workforce.

Table A5. Housing Demand in Total Units, Consensus Scenario, by County, State Planning Region 2, 2012 through 2036

Year	State Planning Region 2							Total
	Bottineau	Burke	McHenry	Mountrail	Pierce	Renville	Ward	
	<u>Permanent Housing<sup>a</sup></u>							
2012	4,474	1,370	3,041	4,409	2,259	1,427	28,016	44,995
2013	4,544	1,385	3,089	4,562	2,290	1,449	28,687	46,005
2014	4,615	1,401	3,139	4,721	2,322	1,471	29,381	47,050
2015	4,688	1,417	3,190	4,885	2,354	1,494	30,091	48,118
2016	4,765	1,434	3,244	5,058	2,388	1,518	30,843	49,250
2017	4,837	1,449	3,294	5,230	2,420	1,540	31,573	50,342
2018	4,937	1,472	3,364	5,437	2,465	1,571	32,501	51,747
2019	5,018	1,490	3,421	5,628	2,501	1,596	33,314	52,966
2020	5,047	1,491	3,442	5,764	2,510	1,605	33,797	53,656
2021	5,088	1,500	3,471	5,864	2,528	1,617	34,218	54,286
2022	5,122	1,506	3,495	5,957	2,542	1,628	34,595	54,846
2023	5,154	1,512	3,518	6,049	2,556	1,638	34,964	55,390
2024	5,181	1,516	3,536	6,134	2,566	1,645	35,293	55,872
2025	5,204	1,519	3,554	6,218	2,575	1,653	35,610	56,332
2026	5,226	1,521	3,569	6,300	2,583	1,659	35,912	56,771
2027	5,245	1,523	3,583	6,380	2,590	1,665	36,203	57,189
2028	5,263	1,524	3,596	6,459	2,596	1,670	36,483	57,591
2029	5,278	1,525	3,607	6,536	2,601	1,674	36,750	57,970
2030	5,291	1,524	3,617	6,611	2,604	1,678	37,004	58,329
2031	5,312	1,529	3,632	6,667	2,614	1,685	37,235	58,673
2032	5,332	1,532	3,646	6,721	2,622	1,691	37,455	59,000
2033	5,350	1,535	3,659	6,774	2,629	1,696	37,666	59,310
2034	5,365	1,538	3,670	6,824	2,635	1,701	37,858	59,591
2035	5,372	1,537	3,675	6,863	2,637	1,703	37,988	59,775
2036	5,390	1,542	3,687	6,885	2,646	1,708	38,112	59,969

- continued -

<sup>a</sup>Housing needs associated with permanent workforce.

Table A5. continued

Year	State Planning Region 2							Total
	Bottineau	Burke	McHenry	Mountrail	Pierce	Renville	Ward	
	Total (Permanent and Temporary) Housing <sup>b</sup>							
2012	5,082	1,556	3,454	5,007	2,565	1,621	31,821	51,106
2013	5,157	1,572	3,507	5,178	2,599	1,645	32,562	52,220
2014	5,233	1,589	3,560	5,353	2,632	1,668	33,315	53,350
2015	5,297	1,601	3,605	5,521	2,660	1,688	34,006	54,379
2016	5,367	1,615	3,654	5,698	2,690	1,709	34,744	55,478
2017	5,414	1,622	3,688	5,854	2,709	1,724	35,343	56,354
2018	5,515	1,645	3,758	6,073	2,754	1,755	36,305	57,805
2019	5,572	1,654	3,798	6,249	2,776	1,772	36,991	58,812
2020	5,574	1,647	3,802	6,366	2,772	1,772	37,326	59,259
2021	5,571	1,642	3,801	6,421	2,768	1,771	37,467	59,441
2022	5,510	1,620	3,760	6,408	2,735	1,751	37,215	58,998
2023	5,468	1,604	3,732	6,416	2,711	1,737	37,088	58,755
2024	5,424	1,587	3,703	6,422	2,687	1,723	36,952	58,497
2025	5,412	1,580	3,695	6,466	2,678	1,719	37,030	58,579
2026	5,397	1,571	3,686	6,506	2,668	1,713	37,089	58,631
2027	5,392	1,566	3,683	6,558	2,662	1,711	37,213	58,785
2028	5,386	1,560	3,680	6,610	2,657	1,709	37,335	58,935
2029	5,373	1,552	3,672	6,654	2,648	1,705	37,414	59,018
2030	5,361	1,544	3,665	6,697	2,639	1,700	37,489	59,095
2031	5,360	1,542	3,665	6,727	2,637	1,700	37,571	59,202
2032	5,360	1,540	3,665	6,756	2,635	1,699	37,651	59,307
2033	5,361	1,538	3,666	6,788	2,634	1,700	37,741	59,428
2034	5,365	1,538	3,670	6,824	2,635	1,701	37,858	59,591
2035	5,372	1,537	3,675	6,863	2,637	1,703	37,988	59,775
2036	5,390	1,542	3,687	6,885	2,646	1,708	38,112	59,969

<sup>b</sup>Housing demand associated with permanent and temporary workforce.

Table A6. Housing Demand in Total Units, Consensus Scenario, by County, State Planning Region 8, 2012 through 2036

State Planning Region 8										
Year	Adams	Billings	Bowman	Dunn	Golden			Slope	Stark	Total
					Valley	Hettinger				
Permanent Housing <sup>a</sup>										
2012	1,400	485	1,741	2,217	988	1,445	443	11,203	19,921	
2013	1,444	497	1,812	2,315	1,022	1,495	456	11,714	20,755	
2014	1,494	510	1,890	2,422	1,059	1,551	472	12,278	21,676	
2015	1,545	523	1,973	2,534	1,098	1,608	488	12,869	22,639	
2016	1,601	538	2,063	2,658	1,141	1,672	505	13,519	23,697	
2017	1,662	554	2,161	2,792	1,187	1,740	524	14,222	24,840	
2018	1,727	571	2,266	2,936	1,237	1,814	544	14,984	26,079	
2019	1,780	583	2,358	3,063	1,279	1,875	560	15,657	27,155	
2020	1,826	593	2,441	3,181	1,315	1,929	574	16,283	28,141	
2021	1,861	602	2,500	3,263	1,343	1,970	585	16,717	28,840	
2022	1,896	610	2,559	3,344	1,370	2,009	595	17,145	29,527	
2023	1,928	617	2,615	3,421	1,395	2,047	605	17,557	30,184	
2024	1,957	624	2,668	3,496	1,418	2,082	614	17,953	30,811	
2025	1,987	630	2,721	3,570	1,442	2,116	623	18,351	31,440	
2026	2,013	636	2,771	3,641	1,463	2,148	631	18,732	32,036	
2027	2,038	640	2,819	3,709	1,483	2,178	639	19,097	32,603	
2028	2,061	644	2,865	3,775	1,502	2,206	646	19,448	33,146	
2029	2,082	647	2,909	3,838	1,520	2,233	652	19,790	33,671	
2030	2,101	650	2,950	3,898	1,536	2,257	658	20,114	34,162	
2031	2,124	655	2,989	3,953	1,554	2,283	665	20,407	34,631	
2032	2,140	658	3,020	3,996	1,567	2,303	670	20,638	34,992	
2033	2,156	661	3,050	4,038	1,580	2,322	674	20,862	35,342	
2034	2,165	662	3,071	4,069	1,588	2,334	677	21,031	35,597	
2035	2,162	660	3,074	4,077	1,587	2,333	676	21,079	35,648	
2036	2,167	661	3,081	4,086	1,591	2,338	678	21,125	35,726	

- continued -

<sup>a</sup>Housing needs associated with permanent workforce.

Table A6. continued

State Planning Region 8										
Year	Adams	Billings	Bowman	Dunn	Golden			Slope	Stark	Total
					Valley	Hettinger				
<u>Total (Permanent and Temporary) Housing<sup>b</sup></u>										
2012	1,820	631	2,263	2,883	1,284	1,879	575	14,565	25,900	
2013	1,883	648	2,362	3,018	1,332	1,950	595	15,273	27,060	
2014	1,951	666	2,469	3,163	1,384	2,025	616	16,036	28,311	
2015	2,014	682	2,571	3,304	1,432	2,097	635	16,775	29,509	
2016	2,082	700	2,683	3,457	1,484	2,174	657	17,583	30,821	
2017	2,144	715	2,788	3,602	1,532	2,245	676	18,351	32,053	
2018	2,214	732	2,905	3,765	1,587	2,325	697	19,211	33,436	
2019	2,261	741	2,994	3,890	1,624	2,381	711	19,885	34,488	
2020	2,290	744	3,062	3,989	1,650	2,420	720	20,423	35,296	
2021	2,296	742	3,084	4,024	1,656	2,430	721	20,619	35,573	
2022	2,259	727	3,049	3,984	1,632	2,394	709	20,428	35,182	
2023	2,231	715	3,026	3,960	1,614	2,369	701	20,321	34,936	
2024	2,213	705	3,016	3,952	1,603	2,353	694	20,295	34,831	
2025	2,211	701	3,028	3,973	1,604	2,355	694	20,422	34,988	
2026	2,205	696	3,035	3,988	1,603	2,353	692	20,516	35,088	
2027	2,207	693	3,053	4,017	1,606	2,359	692	20,681	35,308	
2028	2,208	690	3,069	4,044	1,609	2,364	692	20,837	35,513	
2029	2,215	689	3,095	4,084	1,617	2,376	694	21,058	35,828	
2030	2,209	683	3,102	4,099	1,615	2,373	692	21,152	35,926	
2031	2,212	682	3,113	4,116	1,618	2,378	692	21,249	36,060	
2032	2,221	683	3,134	4,147	1,626	2,390	695	21,416	36,312	
2033	2,232	685	3,158	4,182	1,636	2,404	698	21,604	36,599	
2034	2,238	685	3,173	4,205	1,641	2,412	700	21,733	36,787	
2035	2,234	682	3,177	4,213	1,640	2,411	699	21,782	36,837	
2036	2,242	684	3,188	4,228	1,646	2,419	701	21,860	36,968	

<sup>b</sup>Housing demand associated with permanent and temporary workforce.

Table A7. Housing Demand in Total Units, High Scenario, by County, State Planning Region 1, 2012 through 2036

Year	State Planning Region 1			Total
	Divide	McKenzie	Williams	
	<u>Permanent Housing<sup>a</sup></u>			
2012	1,635	3,816	12,922	18,373
2013	1,833	4,278	14,486	20,596
2014	2,059	4,806	16,275	23,140
2015	2,288	5,339	18,082	25,709
2016	2,520	5,882	19,919	28,321
2017	2,690	6,278	21,258	30,226
2018	2,840	6,627	22,443	31,910
2019	3,028	7,067	23,933	34,029
2020	3,180	7,421	25,131	35,731
2021	3,341	7,798	26,406	37,545
2022	3,450	8,051	27,263	38,763
2023	3,553	8,292	28,082	39,927
2024	3,654	8,528	28,878	41,059
2025	3,751	8,753	29,642	42,146
2026	3,842	8,965	30,361	43,168
2027	3,928	9,167	31,043	44,138
2028	4,009	9,356	31,682	45,046
2029	4,085	9,533	32,284	45,903
2030	4,156	9,700	32,849	46,706
2031	4,197	9,796	33,173	47,167
2032	4,232	9,876	33,445	47,553
2033	4,260	9,942	33,667	47,869
2034	4,272	9,969	33,761	48,002
2035	4,228	9,867	33,412	47,506
2036	4,197	9,795	33,169	47,161

- continued -

<sup>a</sup>Housing needs associated with permanent workforce.



Table A7. continued

Year	State Planning Region 1			Total
	Divide	McKenzie	Williams	
	Total (Permanent and Temporary) Housing <sup>b</sup>			
2012	2,996	6,991	23,676	33,663
2013	3,361	7,844	26,562	37,766
2014	3,616	8,439	28,579	40,634
2015	3,826	8,929	30,237	42,992
2016	4,018	9,376	31,752	45,146
2017	4,151	9,687	32,804	46,642
2018	4,252	9,924	33,607	47,783
2019	4,385	10,234	34,658	49,278
2020	4,489	10,476	35,477	50,442
2021	4,592	10,716	36,289	51,597
2022	4,601	10,739	36,366	51,707
2023	4,464	10,419	35,282	50,164
2024	4,393	10,253	34,721	49,367
2025	4,341	10,130	34,306	48,777
2026	4,327	10,099	34,198	48,623
2027	4,348	10,147	34,363	48,859
2028	4,355	10,165	34,422	48,942
2029	4,371	10,202	34,548	49,121
2030	4,382	10,228	34,636	49,246
2031	4,363	10,183	34,484	49,030
2032	4,331	10,107	34,225	48,663
2033	4,297	10,029	33,964	48,290
2034	4,272	9,969	33,761	48,002
2035	4,228	9,867	33,412	47,506
2036	4,197	9,795	33,169	47,161

<sup>b</sup>Housing demand associated with permanent and temporary workforce.

Table A8. Housing Demand in Total Units, High Scenario, by County, State Planning Region 2, 2012 through 2036

Year	State Planning Region 2							Total
	Bottineau	Burke	McHenry	Mountrail	Pierce	Renville	Ward	
	<u>Permanent Housing<sup>a</sup></u>							
2012	4,487	1,374	3,049	4,421	2,265	1,431	28,095	45,122
2013	4,561	1,391	3,101	4,580	2,298	1,454	28,797	46,182
2014	4,635	1,407	3,153	4,742	2,332	1,478	29,510	47,257
2015	4,712	1,424	3,207	4,911	2,366	1,501	30,248	48,368
2016	4,794	1,443	3,263	5,089	2,403	1,527	31,030	49,548
2017	4,870	1,459	3,317	5,266	2,436	1,550	31,789	50,687
2018	4,977	1,485	3,392	5,481	2,485	1,584	32,766	52,170
2019	5,064	1,503	3,452	5,679	2,523	1,611	33,620	53,453
2020	5,096	1,506	3,476	5,821	2,535	1,620	34,127	54,181
2021	5,140	1,515	3,506	5,924	2,554	1,634	34,568	54,841
2022	5,177	1,522	3,533	6,021	2,570	1,645	34,968	55,436
2023	5,212	1,529	3,557	6,116	2,584	1,656	35,355	56,010
2024	5,242	1,534	3,578	6,207	2,597	1,665	35,711	56,534
2025	5,270	1,538	3,598	6,296	2,608	1,673	36,055	57,038
2026	5,294	1,541	3,616	6,382	2,617	1,681	36,383	57,514
2027	5,317	1,544	3,632	6,467	2,626	1,688	36,698	57,971
2028	5,337	1,546	3,647	6,550	2,633	1,693	36,998	58,404
2029	5,355	1,547	3,660	6,631	2,639	1,699	37,285	58,815
2030	5,371	1,547	3,671	6,710	2,644	1,703	37,561	59,207
2031	5,394	1,552	3,688	6,770	2,654	1,711	37,809	59,577
2032	5,416	1,556	3,703	6,827	2,663	1,717	38,043	59,926
2033	5,435	1,560	3,717	6,882	2,671	1,723	38,265	60,253
2034	5,450	1,562	3,727	6,931	2,677	1,728	38,453	60,528
2035	5,452	1,560	3,730	6,965	2,677	1,728	38,556	60,668
2036	5,469	1,565	3,741	6,986	2,684	1,733	38,670	60,849

- continued -

<sup>a</sup>Housing needs associated with permanent workforce.

Table A8. continued

Year	State Planning Region 2							Total
	Bottineau	Burke	McHenry	Mountrail	Pierce	Renville	Ward	
	<u>Total (Permanent and Temporary) Housing<sup>b</sup></u>							
2012	5,082	1,556	3,454	5,008	2,565	1,621	31,822	51,107
2013	5,202	1,586	3,537	5,223	2,621	1,659	32,841	52,668
2014	5,276	1,602	3,589	5,397	2,654	1,682	33,586	53,785
2015	5,342	1,615	3,636	5,568	2,683	1,702	34,295	54,840
2016	5,415	1,630	3,687	5,749	2,714	1,725	35,054	55,973
2017	5,471	1,639	3,726	5,916	2,737	1,742	35,714	56,945
2018	5,577	1,663	3,800	6,142	2,785	1,775	36,716	58,458
2019	5,640	1,674	3,845	6,326	2,811	1,794	37,449	59,539
2020	5,647	1,669	3,852	6,450	2,809	1,795	37,816	60,038
2021	5,664	1,670	3,864	6,528	2,814	1,800	38,091	60,431
2022	5,659	1,664	3,862	6,581	2,809	1,798	38,224	60,597
2023	5,598	1,642	3,820	6,568	2,776	1,778	37,969	60,151
2024	5,556	1,626	3,793	6,579	2,752	1,765	37,853	59,924
2025	5,521	1,611	3,770	6,597	2,732	1,753	37,778	59,762
2026	5,501	1,602	3,757	6,632	2,719	1,746	37,806	59,764
2027	5,496	1,596	3,754	6,685	2,714	1,744	37,931	59,919
2028	5,484	1,588	3,747	6,731	2,705	1,740	38,018	60,014
2029	5,476	1,582	3,743	6,781	2,698	1,737	38,128	60,145
2030	5,466	1,575	3,737	6,829	2,691	1,734	38,227	60,258
2031	5,464	1,572	3,736	6,857	2,688	1,733	38,298	60,348
2032	5,457	1,568	3,732	6,879	2,683	1,730	38,335	60,386
2033	5,451	1,564	3,728	6,902	2,679	1,728	38,376	60,428
2034	5,450	1,562	3,727	6,931	2,677	1,728	38,453	60,528
2035	5,452	1,560	3,730	6,965	2,677	1,728	38,556	60,668
2036	5,469	1,565	3,741	6,986	2,684	1,733	38,670	60,849

<sup>b</sup>Housing demand associated with permanent and temporary workforce.

Table A9. Housing Demand in Total Units, High Scenario, by County, State Planning Region 8, 2012 through 2036

State Planning Region 8									
Year	Adams	Billings	Bowman	Dunn	Golden Valley	Hettinger	Slope	Stark	Total
<u>Permanent Housing<sup>a</sup></u>									
2012	1,415	490	1,759	2,241	998	1,460	447	11,322	20,132
2013	1,464	504	1,837	2,346	1,036	1,516	463	11,875	21,040
2014	1,517	518	1,919	2,459	1,076	1,575	479	12,466	22,007
2015	1,573	533	2,008	2,581	1,118	1,638	496	13,103	23,051
2016	1,633	549	2,104	2,711	1,164	1,705	515	13,791	24,173
2017	1,698	566	2,207	2,852	1,213	1,778	535	14,530	25,378
2018	1,772	586	2,325	3,012	1,269	1,861	558	15,371	26,753
2019	1,837	602	2,433	3,161	1,320	1,935	578	16,156	28,021
2020	1,904	618	2,545	3,317	1,372	2,012	598	16,980	29,346
2021	1,962	634	2,636	3,439	1,415	2,076	616	17,621	30,400
2022	2,021	650	2,728	3,565	1,460	2,142	635	18,278	31,480
2023	2,078	666	2,818	3,688	1,503	2,206	652	18,926	32,538
2024	2,132	680	2,906	3,808	1,545	2,268	669	19,558	33,566
2025	2,185	693	2,993	3,928	1,586	2,328	686	20,188	34,586
2026	2,235	706	3,077	4,043	1,625	2,385	701	20,797	35,568
2027	2,283	717	3,158	4,155	1,662	2,440	716	21,391	36,520
2028	2,327	727	3,235	4,263	1,696	2,491	729	21,963	37,432
2029	2,369	737	3,310	4,367	1,729	2,541	742	22,518	38,312
2030	2,407	745	3,380	4,466	1,760	2,586	754	23,048	39,146
2031	2,449	755	3,447	4,558	1,792	2,633	766	23,529	39,929
2032	2,479	762	3,498	4,628	1,815	2,667	776	23,902	40,527
2033	2,504	768	3,542	4,691	1,835	2,697	783	24,234	41,055
2034	2,517	770	3,570	4,731	1,846	2,713	787	24,451	41,386
2035	2,510	766	3,569	4,733	1,842	2,708	785	24,471	41,385
2036	2,515	767	3,576	4,742	1,846	2,713	786	24,519	41,465

- continued -

<sup>a</sup>Housing needs associated with permanent workforce.

Table A9. continued

State Planning Region 8									
Year	Adams	Billings	Bowman	Dunn	Golden Valley	Hettinger	Slope	Stark	Total
Total (Permanent and Temporary) Housing <sup>b</sup>									
2012	1,827	633	2,272	2,894	1,289	1,886	578	14,623	26,003
2013	1,918	660	2,406	3,074	1,357	1,986	606	15,557	27,565
2014	1,987	679	2,515	3,222	1,409	2,063	628	16,333	28,836
2015	2,062	699	2,633	3,383	1,466	2,147	651	17,179	30,221
2016	2,135	718	2,751	3,544	1,522	2,229	673	18,026	31,597
2017	2,212	737	2,876	3,715	1,580	2,316	697	18,928	33,061
2018	2,305	762	3,025	3,919	1,652	2,421	726	19,999	34,809
2019	2,388	783	3,163	4,110	1,716	2,516	751	21,005	36,430
2020	2,473	803	3,307	4,309	1,782	2,613	777	22,058	38,123
2021	2,541	822	3,414	4,454	1,833	2,689	798	22,822	39,373
2022	2,593	834	3,500	4,573	1,873	2,748	814	23,449	40,385
2023	2,589	829	3,511	4,594	1,873	2,749	813	23,578	40,536
2024	2,586	824	3,525	4,619	1,874	2,751	812	23,725	40,717
2025	2,590	822	3,547	4,654	1,879	2,759	813	23,924	40,988
2026	2,606	823	3,587	4,713	1,894	2,781	817	24,246	41,467
2027	2,632	827	3,640	4,789	1,915	2,812	825	24,657	42,097
2028	2,645	827	3,677	4,845	1,928	2,832	829	24,964	42,547
2029	2,665	829	3,723	4,913	1,946	2,858	835	25,335	43,104
2030	2,671	826	3,750	4,955	1,953	2,869	836	25,568	43,427
2031	2,679	826	3,771	4,986	1,960	2,880	838	25,739	43,679
2032	2,672	822	3,770	4,989	1,956	2,875	836	25,764	43,684
2033	2,661	816	3,765	4,985	1,950	2,866	833	25,755	43,631
2034	2,647	810	3,754	4,975	1,941	2,853	828	25,711	43,520
2035	2,627	802	3,736	4,954	1,928	2,834	822	25,613	43,315
2036	2,620	799	3,725	4,939	1,923	2,826	819	25,538	43,190

<sup>b</sup>Housing demand associated with permanent and temporary workforce.

## Appendix B

Table B1. Population Estimates, Low Scenario, by County, State Planning Region 1, North Dakota, 2010 through 2036

Year	State Planning Region 1			Total
	Divide	McKenzie	Williams	
	<u>Permanent Population<sup>a</sup></u>			
2010	2,071	6,360	22,398	30,829
2011	2,125	7,019	24,374	33,518
2012	2,949	8,666	26,791	38,406
2013	3,234	9,546	29,572	42,353
2014	3,800	11,265	34,970	50,035
2015	4,078	12,146	37,785	54,008
2016	4,348	12,951	40,292	57,592
2017	4,548	13,545	42,140	60,232
2018	4,716	14,046	43,698	62,460
2019	5,007	14,913	46,393	66,313
2020	5,190	15,459	48,093	68,742
2021	5,306	15,803	49,164	70,273
2022	5,417	16,136	50,197	71,750
2023	5,520	16,441	51,148	73,109
2024	5,617	16,730	52,048	74,395
2025	5,709	17,006	52,906	75,622
2026	5,796	17,265	53,712	76,774
2027	5,878	17,508	54,468	77,854
2028	5,954	17,735	55,175	78,864
2029	6,027	17,951	55,846	79,824
2030	6,094	18,153	56,473	80,721
2031	6,158	18,343	57,064	81,565
2032	6,176	18,397	57,233	81,807
2033	6,191	18,442	57,374	82,007
2034	6,201	18,471	57,462	82,133
2035	6,175	18,394	57,223	81,793
2036	6,138	18,282	56,876	81,295

- continued -

<sup>a</sup> Population associated with permanent workforce. Population in 2010 represents Census estimates.

Table B1. Continued

Year	State Planning Region 1			Total
	Divide	McKenzie	Williams	
	Service (Permanent and Temporary) Population <sup>b</sup>			
2010 <sup>c</sup>	2,071	6,360	22,398	30,829
2011	2,125	7,019	24,374	33,518
2012	5,569	16,363	50,585	72,517
2013	5,692	16,798	52,037	74,526
2014	6,018	17,844	55,393	79,255
2015	6,213	18,506	57,571	82,289
2016	6,462	19,247	59,878	85,587
2017	6,614	19,702	61,292	87,608
2018	6,725	20,031	62,316	89,072
2019	6,893	20,533	63,877	91,302
2020	6,885	20,507	63,798	91,190
2021	6,627	19,740	61,412	87,780
2022	6,441	19,185	59,684	85,309
2023	6,307	18,785	58,440	83,532
2024	6,288	18,730	58,267	83,285
2025	6,270	18,677	58,103	83,050
2026	6,252	18,623	57,935	82,810
2027	6,261	18,649	58,017	82,927
2028	6,265	18,661	58,053	82,978
2029	6,277	18,697	58,165	83,138
2030	6,272	18,682	58,120	83,074
2031	6,276	18,693	58,153	83,121
2032	6,235	18,571	57,773	82,578
2033	6,213	18,507	57,576	82,297
2034	6,201	18,471	57,462	82,134
2035	6,175	18,394	57,223	81,793
2036	6,138	18,282	56,876	81,295

<sup>b</sup> Population associated with permanent and temporary workforce.

<sup>c</sup> Service population not estimated for 2010. Figures represent 2010 Census population only (U.S. Census Bureau 2012b).



Table B2. Population Estimates, Low Scenario, by County, State Planning Region 2, North Dakota, 2010 through 2036

Year	State Planning Region 2 Counties							Total
	Bottineau	Burke	McHenry	Mountrail	Pierce	Renville	Ward	
	Permanent Population <sup>a</sup>							
2010	6,429	1,968	5,395	7,673	4,357	2,470	61,675	89,967
2011	6,443	2,033	5,505	8,097	4,375	2,490	64,072	93,015
2012	8,995	2,657	6,424	10,470	4,618	3,063	64,720	100,946
2013	9,092	2,676	6,503	10,779	4,655	3,090	65,752	102,547
2014	9,188	2,695	6,583	11,096	4,691	3,118	66,797	104,169
2015	9,286	2,714	6,664	11,421	4,727	3,145	67,856	105,814
2016	9,421	2,741	6,764	11,803	4,787	3,190	69,419	108,125
2017	9,546	2,765	6,857	12,182	4,842	3,231	70,934	110,356
2018	9,721	2,803	6,986	12,635	4,921	3,289	72,853	113,209
2019	9,861	2,830	7,089	13,053	4,982	3,334	74,528	115,678
2020	9,906	2,830	7,125	13,353	4,995	3,348	75,511	117,068
2021	9,974	2,842	7,175	13,566	5,024	3,370	76,353	118,304
2022	10,029	2,851	7,217	13,765	5,047	3,388	77,110	119,408
2023	10,081	2,859	7,256	13,961	5,068	3,405	77,840	120,469
2024	10,123	2,864	7,288	14,147	5,084	3,418	78,509	121,435
2025	10,162	2,868	7,318	14,330	5,099	3,431	79,153	122,360
2026	10,198	2,870	7,345	14,510	5,111	3,442	79,778	123,255
2027	10,230	2,872	7,370	14,687	5,122	3,452	80,382	124,116
2028	10,259	2,873	7,393	14,861	5,131	3,461	80,962	124,939
2029	10,286	2,873	7,414	15,033	5,139	3,469	81,531	125,745
2030	10,310	2,872	7,433	15,203	5,145	3,476	82,079	126,517
2031	10,350	2,879	7,463	15,330	5,163	3,489	82,580	127,253
2032	10,388	2,886	7,491	15,454	5,179	3,502	83,065	127,963
2033	10,423	2,892	7,518	15,577	5,194	3,513	83,537	128,653
2034	10,457	2,897	7,543	15,697	5,208	3,524	83,993	129,319
2035	10,476	2,899	7,558	15,796	5,214	3,530	84,334	129,807
2036	10,511	2,908	7,582	15,847	5,231	3,542	84,609	130,230

- continued -

<sup>a</sup> Population associated with permanent workforce. Population in 2010 represents Census estimates.

Table B2. Continued

Year	State Planning Region 2 Counties							Total
	Bottineau	Burke	McHenry	Mountrail	Pierce	Renville	Ward	
	Service (Permanent and Temporary) Population <sup>b</sup>							
2010 <sup>c</sup>	6,429	1,968	5,395	7,673	4,357	2,470	61,675	89,967
2011	6,443	2,033	5,505	8,097	4,375	2,490	64,072	93,015
2012	10,214	3,017	7,294	11,888	5,244	3,478	73,492	114,627
2013	10,162	2,991	7,269	12,048	5,202	3,454	73,492	114,618
2014	10,234	3,002	7,332	12,359	5,225	3,472	74,395	116,018
2015	10,312	3,014	7,401	12,684	5,250	3,493	75,357	117,512
2016	10,440	3,038	7,495	13,080	5,305	3,535	76,927	119,819
2017	10,531	3,051	7,564	13,439	5,341	3,564	78,255	121,746
2018	10,690	3,083	7,682	13,895	5,412	3,616	80,113	124,491
2019	10,772	3,092	7,744	14,258	5,442	3,642	81,411	126,361
2020	10,721	3,063	7,711	14,451	5,406	3,624	81,724	126,700
2021	10,615	3,025	7,637	14,438	5,347	3,587	81,263	125,912
2022	10,529	2,993	7,576	14,451	5,299	3,557	80,951	125,356
2023	10,466	2,968	7,533	14,495	5,262	3,535	80,814	125,071
2024	10,451	2,956	7,524	14,605	5,249	3,529	81,050	125,364
2025	10,435	2,945	7,514	14,715	5,235	3,523	81,279	125,645
2026	10,419	2,933	7,504	14,824	5,222	3,517	81,508	125,927
2027	10,415	2,924	7,504	14,952	5,215	3,514	81,835	126,360
2028	10,408	2,915	7,500	15,077	5,206	3,511	82,140	126,758
2029	10,406	2,906	7,500	15,208	5,199	3,509	82,480	127,209
2030	10,394	2,895	7,494	15,327	5,188	3,505	82,753	127,557
2031	10,406	2,895	7,503	15,412	5,190	3,508	83,025	127,939
2032	10,415	2,894	7,511	15,495	5,192	3,511	83,285	128,303
2033	10,434	2,895	7,525	15,592	5,199	3,517	83,619	128,781
2034	10,457	2,897	7,543	15,697	5,208	3,524	83,993	129,319
2035	10,476	2,899	7,558	15,796	5,214	3,530	84,334	129,807
2036	10,511	2,908	7,582	15,847	5,231	3,542	84,609	130,230

<sup>b</sup> Population associated with permanent and temporary workforce.

<sup>c</sup> Service population not estimated for 2010. Figures represent 2010 Census population only (U.S. Census Bureau 2012b).

Table B3. Population Estimates, Low Scenario, by County, State Planning Region 8, North Dakota, 2010 through 2036

State Planning Region 8 Counties										
Year	Adams	Billings	Bowman	Dunn	Golden			Slope	Stark	Total
					Valley	Hettinger	Permanent Population <sup>a</sup>			
2010	2,343	783	3,151	3,536	1,680	2,477	727	24,199	38,896	
2011	2,307	816	3,134	3,720	1,752	2,515	718	25,177	40,139	
2012	2,178	829	3,294	3,781	1,648	2,412	684	23,248	38,074	
2013	2,212	835	3,365	3,933	1,710	2,443	701	23,659	38,858	
2014	2,261	846	3,460	4,118	1,785	2,488	724	24,221	39,904	
2015	2,309	857	3,554	4,309	1,863	2,533	747	24,770	40,943	
2016	2,390	880	3,713	4,514	1,933	2,630	773	25,990	42,823	
2017	2,470	902	3,871	4,720	2,003	2,725	798	27,221	44,709	
2018	2,555	926	4,043	4,943	2,078	2,828	825	28,554	46,752	
2019	2,622	942	4,187	5,134	2,138	2,911	846	29,706	48,486	
2020	2,653	944	4,277	5,259	2,169	2,954	855	30,478	49,591	
2021	2,678	949	4,338	5,341	2,193	2,987	863	30,977	50,325	
2022	2,701	953	4,396	5,421	2,215	3,017	870	31,465	51,038	
2023	2,721	955	4,450	5,495	2,235	3,045	876	31,923	51,700	
2024	2,740	957	4,503	5,567	2,253	3,070	882	32,369	52,341	
2025	2,758	959	4,554	5,639	2,271	3,096	887	32,812	52,977	
2026	2,774	960	4,603	5,708	2,288	3,119	892	33,239	53,582	
2027	2,788	960	4,650	5,773	2,303	3,140	896	33,648	54,158	
2028	2,801	959	4,694	5,837	2,317	3,160	900	34,043	54,710	
2029	2,812	958	4,736	5,897	2,330	3,177	903	34,424	55,237	
2030	2,822	956	4,776	5,955	2,341	3,194	906	34,789	55,739	
2031	2,837	959	4,815	6,007	2,356	3,214	910	35,109	56,208	
2032	2,840	957	4,832	6,033	2,360	3,220	911	35,270	56,423	
2033	2,842	955	4,847	6,056	2,363	3,225	911	35,420	56,620	
2034	2,842	953	4,859	6,076	2,365	3,228	911	35,549	56,783	
2035	2,832	947	4,854	6,074	2,359	3,219	908	35,553	56,745	
2036	2,826	945	4,845	6,062	2,354	3,213	906	35,485	56,637	

- continued -

<sup>a</sup> Population associated with permanent workforce. Population in 2010 represents Census estimates.

Table B3. Continued

State Planning Region 8 Counties									
Year	Golden								Total
	Adams	Billings	Bowman	Dunn	Valley	Hettinger	Slope	Stark	
<u>Service (Permanent and Temporary) Population<sup>b</sup></u>									
2010 <sup>c</sup>	2,343	783	3,151	3,536	1,680	2,477	727	24,199	38,896
2011	2,307	816	3,134	3,720	1,752	2,515	718	25,177	40,139
2012	2,833	1,078	4,286	4,920	2,144	3,138	890	30,246	49,535
2013	2,817	1,064	4,286	5,009	2,177	3,111	893	30,129	49,485
2014	2,871	1,075	4,393	5,229	2,267	3,160	919	30,755	50,668
2015	2,926	1,086	4,505	5,461	2,361	3,210	947	31,393	51,889
2016	3,026	1,115	4,701	5,715	2,448	3,329	978	32,907	54,219
2017	3,111	1,136	4,876	5,945	2,523	3,432	1,005	34,287	56,315
2018	3,192	1,156	5,050	6,175	2,596	3,533	1,030	35,670	58,402
2019	3,228	1,159	5,155	6,321	2,632	3,584	1,041	36,573	59,694
2020	3,201	1,139	5,161	6,345	2,618	3,565	1,032	36,774	59,835
2021	3,121	1,106	5,055	6,224	2,556	3,481	1,005	36,102	58,650
2022	3,054	1,077	4,970	6,128	2,504	3,411	983	35,570	57,696
2023	2,997	1,052	4,902	6,053	2,461	3,354	965	35,163	56,947
2024	2,976	1,040	4,891	6,047	2,448	3,335	958	35,161	56,856
2025	2,956	1,027	4,881	6,044	2,434	3,318	951	35,168	56,779
2026	2,935	1,015	4,871	6,039	2,421	3,300	944	35,170	56,695
2027	2,923	1,006	4,875	6,053	2,415	3,292	940	35,279	56,784
2028	2,910	997	4,877	6,065	2,408	3,283	935	35,372	56,847
2029	2,900	988	4,884	6,081	2,402	3,277	931	35,499	56,962
2030	2,884	977	4,882	6,087	2,393	3,264	926	35,557	56,968
2031	2,878	973	4,885	6,095	2,390	3,261	924	35,618	57,023
2032	2,860	964	4,866	6,076	2,377	3,243	918	35,524	56,829
2033	2,849	958	4,860	6,072	2,370	3,234	914	35,516	56,772
2034	2,842	953	4,859	6,076	2,365	3,228	911	35,549	56,783
2035	2,832	947	4,854	6,074	2,359	3,219	908	35,553	56,745
2036	2,826	945	4,845	6,062	2,354	3,213	906	35,485	56,637

<sup>b</sup> Population associated with permanent and temporary workforce.

<sup>c</sup> Service population not estimated for 2010. Figures represent 2010 Census population only (U.S. Census Bureau 2012b).

Table B4. Population Estimates, Consensus Scenario, by County, State Planning Region 1, North Dakota, 2010 through 2036

Year	State Planning Region 1			Total
	Divide	McKenzie	Williams	
	<u>Permanent Population<sup>a</sup></u>			
2010	2,071	6,360	22,398	30,829
2011	2,125	7,019	24,374	33,518
2012	2,981	8,760	27,081	38,822
2013	3,304	9,752	30,210	43,266
2014	3,750	11,119	34,518	49,388
2015	4,077	12,145	37,784	54,007
2016	4,425	13,181	41,005	58,611
2017	4,707	14,021	43,619	62,346
2018	4,969	14,801	46,046	65,816
2019	5,298	15,780	49,092	70,170
2020	5,650	16,828	52,352	74,829
2021	5,801	17,280	53,758	76,840
2022	5,948	17,716	55,113	78,776
2023	6,086	18,127	56,393	80,606
2024	6,212	18,503	57,564	82,279
2025	6,332	18,862	58,680	83,874
2026	6,444	19,195	59,716	85,356
2027	6,549	19,506	60,682	86,737
2028	6,646	19,797	61,588	88,031
2029	6,736	20,064	62,418	89,218
2030	6,818	20,308	63,178	90,304
2031	6,893	20,533	63,878	91,304
2032	6,942	20,677	64,327	91,946
2033	6,983	20,801	64,712	92,497
2034	7,002	20,858	64,888	92,748
2035	6,976	20,780	64,645	92,401
2036	6,955	20,717	64,451	92,124

- continued -

<sup>a</sup> Population associated with permanent workforce. Population in 2010 represents Census estimates.

Table B4. Continued

Year	State Planning Region 1			Total
	Divide	McKenzie	Williams	
	Service (Permanent and Temporary) Population <sup>b</sup>			
2010 <sup>c</sup>	2,071	6,360	22,398	30,829
2011	2,125	7,019	24,374	33,518
2012	5,621	16,517	51,061	73,199
2013	6,062	17,891	55,424	79,377
2014	6,455	19,136	59,406	84,997
2015	6,711	19,989	62,186	88,885
2016	7,020	20,911	65,053	92,984
2017	7,226	21,524	66,960	95,709
2018	7,413	22,081	68,693	98,187
2019	7,638	22,752	70,782	101,173
2020	7,897	23,522	73,178	104,597
2021	7,863	23,422	72,866	104,151
2022	7,585	22,593	70,288	100,466
2023	7,400	22,043	68,576	98,020
2024	7,229	21,531	66,984	95,744
2025	7,201	21,448	66,725	95,373
2026	7,161	21,331	66,361	94,854
2027	7,164	21,339	66,384	94,887
2028	7,165	21,341	66,391	94,897
2029	7,139	21,266	66,157	94,562
2030	7,112	21,185	65,907	94,205
2031	7,097	21,139	65,763	93,998
2032	7,060	21,030	65,423	93,513
2033	7,029	20,937	65,134	93,100
2034	7,002	20,858	64,888	92,748
2035	6,976	20,780	64,645	92,401
2036	6,955	20,717	64,451	92,124

<sup>b</sup> Population associated with permanent and temporary workforce.

<sup>c</sup> Service population not estimated for 2010. Figures represent 2010 Census population only (U.S. Census Bureau 2012b).

Table B5. Population Estimates, Consensus Scenario, by County, State Planning Region 2, North Dakota, 2010 through 2036

Year	State Planning Region 2 Counties							Total
	Bottineau	Burke	McHenry	Mountrail	Pierce	Renville	Ward	
	Permanent Population <sup>a</sup>							
2010	6,429	1,968	5,395	7,673	4,357	2,470	61,675	89,967
2011	6,443	2,033	5,505	8,097	4,375	2,490	64,072	93,015
2012	9,008	2,661	6,433	10,485	4,625	3,067	64,816	101,096
2013	9,120	2,685	6,524	10,813	4,669	3,100	65,959	102,870
2014	9,235	2,709	6,617	11,153	4,715	3,134	67,136	104,698
2015	9,351	2,733	6,711	11,501	4,760	3,167	68,331	106,555
2016	9,505	2,766	6,824	11,909	4,830	3,218	70,039	109,091
2017	9,648	2,795	6,930	12,313	4,894	3,265	71,696	111,542
2018	9,848	2,840	7,077	12,800	4,986	3,332	73,802	114,685
2019	10,009	2,873	7,196	13,249	5,057	3,385	75,650	117,419
2020	10,068	2,876	7,241	13,571	5,077	3,403	76,746	118,982
2021	10,150	2,892	7,302	13,806	5,113	3,430	77,702	120,395
2022	10,218	2,905	7,353	14,024	5,142	3,452	78,559	121,652
2023	10,282	2,916	7,401	14,240	5,169	3,473	79,396	122,876
2024	10,334	2,923	7,440	14,442	5,190	3,490	80,144	123,963
2025	10,382	2,929	7,476	14,639	5,209	3,505	80,863	125,002
2026	10,424	2,934	7,508	14,832	5,225	3,518	81,550	125,992
2027	10,463	2,937	7,538	15,021	5,239	3,530	82,209	126,937
2028	10,498	2,940	7,565	15,206	5,250	3,541	82,846	127,846
2029	10,528	2,940	7,589	15,387	5,260	3,551	83,451	128,707
2030	10,555	2,940	7,609	15,564	5,268	3,559	84,028	129,522
2031	10,597	2,948	7,641	15,696	5,286	3,573	84,554	130,295
2032	10,636	2,955	7,670	15,824	5,303	3,585	85,054	131,028
2033	10,672	2,961	7,697	15,949	5,318	3,597	85,532	131,727
2034	10,703	2,966	7,720	16,066	5,330	3,607	85,967	132,359
2035	10,716	2,965	7,731	16,157	5,334	3,611	86,264	132,777
2036	10,751	2,975	7,756	16,210	5,351	3,623	86,544	133,209

- continued -

<sup>a</sup> Population associated with permanent workforce. Population in 2010 represents Census estimates.

Table B5. Continued

Year	State Planning Region 2 Counties							Total
	Bottineau	Burke	McHenry	Mountrail	Pierce	Renville	Ward	
	Service (Permanent and Temporary) Population <sup>b</sup>							
2010 <sup>c</sup>	6,429	1,968	5,395	7,673	4,357	2,470	61,675	89,967
2011	6,443	2,033	5,505	8,097	4,375	2,490	64,072	93,015
2012	10,232	3,023	7,307	11,909	5,253	3,484	73,620	114,827
2013	10,352	3,047	7,405	12,274	5,300	3,519	74,869	116,765
2014	10,472	3,072	7,503	12,646	5,346	3,553	76,125	118,717
2015	10,567	3,089	7,584	12,998	5,380	3,580	77,221	120,418
2016	10,707	3,115	7,687	13,415	5,441	3,625	78,896	122,886
2017	10,800	3,129	7,758	13,783	5,478	3,655	80,258	124,861
2018	11,001	3,172	7,905	14,299	5,569	3,722	82,442	128,110
2019	11,114	3,190	7,990	14,711	5,615	3,758	83,999	130,378
2020	11,119	3,176	7,998	14,988	5,607	3,758	84,759	131,405
2021	11,114	3,167	7,995	15,116	5,599	3,755	85,080	131,827
2022	10,991	3,125	7,909	15,086	5,531	3,713	84,507	130,863
2023	10,907	3,093	7,850	15,106	5,483	3,684	84,220	130,343
2024	10,820	3,061	7,789	15,121	5,434	3,654	83,910	129,788
2025	10,796	3,046	7,774	15,223	5,416	3,645	84,088	129,987
2026	10,766	3,030	7,754	15,318	5,396	3,634	84,221	130,119
2027	10,755	3,019	7,748	15,440	5,385	3,629	84,504	130,480
2028	10,743	3,008	7,742	15,561	5,373	3,624	84,780	130,832
2029	10,719	2,994	7,726	15,665	5,355	3,615	84,960	131,033
2030	10,693	2,979	7,709	15,768	5,337	3,605	85,131	131,222
2031	10,693	2,975	7,710	15,838	5,334	3,605	85,316	131,469
2032	10,692	2,970	7,710	15,907	5,330	3,604	85,498	131,711
2033	10,694	2,967	7,713	15,981	5,328	3,604	85,703	131,989
2034	10,703	2,966	7,720	16,066	5,330	3,607	85,967	132,359
2035	10,716	2,965	7,731	16,157	5,334	3,611	86,264	132,778
2036	10,751	2,975	7,756	16,210	5,351	3,623	86,544	133,209

<sup>b</sup> Population associated with permanent and temporary workforce.

<sup>c</sup> Service population not estimated for 2010. Figures represent 2010 Census population only (U.S. Census Bureau 2012b).



Table B6. Population Estimates, Consensus Scenario, by County, State Planning Region 8, North Dakota, 2010 through 2036

State Planning Region 8 Counties										
Year	Adams	Billings	Bowman	Dunn	Golden			Slope	Stark	Total
					Valley	Hettinger	Golden			
Permanent Population <sup>a</sup>										
2010	2,343	783	3,151	3,536	1,680	2,477	727	24,199	38,896	
2011	2,307	816	3,134	3,720	1,752	2,515	718	25,177	40,139	
2012	2,178	829	3,295	3,782	1,648	2,413	684	23,253	38,083	
2013	2,223	839	3,382	3,953	1,718	2,455	705	23,775	39,050	
2014	2,273	851	3,479	4,141	1,795	2,502	728	24,354	40,122	
2015	2,324	863	3,578	4,338	1,875	2,550	752	24,934	41,213	
2016	2,409	887	3,742	4,549	1,948	2,650	779	26,193	43,157	
2017	2,500	913	3,919	4,778	2,027	2,758	808	27,555	45,257	
2018	2,598	941	4,110	5,026	2,113	2,875	839	29,031	47,533	
2019	2,678	962	4,276	5,243	2,183	2,972	864	30,336	49,514	
2020	2,746	977	4,427	5,444	2,246	3,058	885	31,549	51,332	
2021	2,800	992	4,535	5,584	2,293	3,123	902	32,389	52,617	
2022	2,852	1,006	4,641	5,722	2,338	3,185	918	33,218	53,881	
2023	2,900	1,018	4,742	5,855	2,381	3,244	933	34,016	55,090	
2024	2,944	1,028	4,839	5,983	2,421	3,300	947	34,784	56,247	
2025	2,989	1,039	4,935	6,110	2,461	3,354	961	35,555	57,405	
2026	3,029	1,048	5,026	6,232	2,498	3,405	974	36,293	58,506	
2027	3,066	1,055	5,113	6,349	2,533	3,453	985	37,000	59,554	
2028	3,100	1,062	5,196	6,460	2,565	3,497	996	37,681	60,556	
2029	3,132	1,067	5,276	6,569	2,595	3,539	1,006	38,344	61,528	
2030	3,161	1,071	5,350	6,671	2,623	3,578	1,014	38,971	62,438	
2031	3,195	1,080	5,422	6,766	2,653	3,620	1,025	39,539	63,300	
2032	3,220	1,085	5,478	6,839	2,676	3,651	1,033	39,986	63,966	
2033	3,243	1,090	5,531	6,911	2,697	3,680	1,040	40,421	64,614	
2034	3,257	1,092	5,570	6,964	2,711	3,700	1,044	40,747	65,085	
2035	3,253	1,087	5,576	6,977	2,710	3,698	1,043	40,840	65,184	
2036	3,260	1,090	5,589	6,993	2,716	3,706	1,045	40,930	65,328	

- continued -

<sup>a</sup> Population associated with permanent workforce. Population in 2010 represents Census estimates.

Table B6. Continued

State Planning Region 8 Counties										
Year	Adams	Billings	Bowman	Dunn	Golden			Slope	Stark	Total
					Valley	Hettinger				
Service (Permanent and Temporary) Population <sup>b</sup>										
2010 <sup>c</sup>	2,343	783	3,151	3,536	1,680	2,477	727	24,199	38,896	
2011	2,307	816	3,134	3,720	1,752	2,515	718	25,177	40,139	
2012	2,832	1,078	4,284	4,917	2,143	3,137	889	30,232	49,512	
2013	2,898	1,094	4,409	5,153	2,240	3,200	919	30,998	50,912	
2014	2,969	1,112	4,544	5,408	2,344	3,268	951	31,808	52,403	
2015	3,030	1,125	4,664	5,654	2,444	3,323	980	32,501	53,721	
2016	3,133	1,154	4,867	5,917	2,534	3,447	1,013	34,067	56,131	
2017	3,226	1,178	5,057	6,165	2,616	3,559	1,042	35,555	58,397	
2018	3,331	1,207	5,270	6,443	2,709	3,686	1,075	37,221	60,942	
2019	3,401	1,221	5,431	6,659	2,773	3,775	1,097	38,527	62,884	
2020	3,445	1,226	5,553	6,828	2,817	3,836	1,110	39,570	64,384	
2021	3,454	1,224	5,594	6,888	2,828	3,852	1,113	39,950	64,902	
2022	3,398	1,198	5,530	6,818	2,786	3,795	1,094	39,580	64,200	
2023	3,356	1,178	5,489	6,777	2,756	3,755	1,080	39,372	63,763	
2024	3,329	1,163	5,470	6,763	2,737	3,730	1,071	39,323	63,585	
2025	3,326	1,156	5,492	6,800	2,739	3,733	1,070	39,569	63,885	
2026	3,318	1,147	5,505	6,826	2,736	3,730	1,067	39,750	64,079	
2027	3,320	1,143	5,537	6,875	2,743	3,739	1,067	40,069	64,494	
2028	3,322	1,137	5,567	6,922	2,748	3,747	1,067	40,372	64,881	
2029	3,333	1,135	5,614	6,990	2,761	3,766	1,070	40,800	65,470	
2030	3,324	1,126	5,626	7,015	2,758	3,762	1,067	40,983	65,661	
2031	3,327	1,124	5,646	7,045	2,763	3,769	1,068	41,171	65,913	
2032	3,341	1,126	5,684	7,097	2,777	3,788	1,072	41,495	66,381	
2033	3,358	1,129	5,728	7,157	2,793	3,811	1,077	41,858	66,910	
2034	3,366	1,128	5,756	7,197	2,802	3,823	1,079	42,109	67,261	
2035	3,361	1,124	5,763	7,210	2,800	3,821	1,078	42,203	67,360	
2036	3,373	1,128	5,783	7,236	2,810	3,835	1,081	42,354	67,600	

<sup>b</sup> Population associated with permanent and temporary workforce.

<sup>c</sup> Service population not estimated for 2010. Figures represent 2010 Census population only (U.S. Census Bureau 2012b).

Table B7. Population Estimates, High Scenario, by County, State Planning Region 1, North Dakota, 2010 through 2036

Year	State Planning Region 1			Total
	Divide	McKenzie	Williams	
	<u>Permanent Population<sup>a</sup></u>			
2010	2,071	6,360	22,398	30,829
2011	2,125	7,019	24,374	33,518
2012	3,098	9,102	28,139	40,339
2013	3,422	10,101	31,290	44,813
2014	3,789	11,232	34,870	49,891
2015	4,146	12,351	38,424	54,921
2016	4,568	13,606	42,328	60,502
2017	4,875	14,521	45,175	64,571
2018	5,147	15,330	47,692	68,168
2019	5,488	16,348	50,858	72,695
2020	5,763	17,166	53,403	76,332
2021	6,055	18,037	56,113	80,206
2022	6,252	18,623	57,935	82,809
2023	6,440	19,182	59,674	85,295
2024	6,622	19,725	61,366	87,713
2025	6,798	20,247	62,990	90,035
2026	6,962	20,738	64,517	92,218
2027	7,119	21,205	65,968	94,292
2028	7,265	21,641	67,324	96,231
2029	7,403	22,052	68,605	98,060
2030	7,533	22,438	69,806	99,777
2031	7,607	22,660	70,494	100,761
2032	7,670	22,845	71,072	101,587
2033	7,721	22,997	71,544	102,261
2034	7,742	23,061	71,742	102,545
2035	7,662	22,823	71,001	101,486
2036	7,606	22,657	70,486	100,749

- continued -

<sup>a</sup> Population associated with permanent workforce. Population in 2010 represents Census estimates.

Table B7. Continued

Year	State Planning Region 1			Total
	Divide	McKenzie	Williams	
	<u>Service (Permanent and Temporary) Population<sup>b</sup></u>			
2010 <sup>c</sup>	2,071	6,360	22,398	30,829
2011	2,125	7,019	24,374	33,518
2012	5,676	16,677	51,556	73,908
2013	6,275	18,521	57,375	82,171
2014	6,653	19,724	61,230	87,607
2015	6,934	20,654	64,255	91,843
2016	7,281	21,689	67,474	96,444
2017	7,523	22,408	69,710	99,640
2018	7,707	22,956	71,415	102,078
2019	7,948	23,674	73,649	105,270
2020	8,136	24,233	75,388	107,757
2021	8,322	24,788	77,115	110,225
2022	8,340	24,841	77,279	110,460
2023	8,091	24,100	74,974	107,165
2024	7,962	23,717	73,782	105,461
2025	7,867	23,433	72,900	104,200
2026	7,842	23,359	72,671	103,872
2027	7,880	23,472	73,023	104,375
2028	7,894	23,513	73,148	104,554
2029	7,923	23,598	73,414	104,935
2030	7,943	23,659	73,602	105,204
2031	7,908	23,555	73,279	104,741
2032	7,849	23,378	72,730	103,957
2033	7,789	23,199	72,173	103,161
2034	7,742	23,061	71,742	102,545
2035	7,662	22,823	71,001	101,486
2036	7,606	22,657	70,486	100,749

<sup>b</sup> Population associated with permanent and temporary workforce.

<sup>c</sup> Service population not estimated for 2010. Figures represent 2010 Census population only (U.S. Census Bureau 2012b).

Table B8. Population Estimates, High Scenario, by County, State Planning Region 2, North Dakota, 2010 through 2036

Year	State Planning Region 2 Counties							Total
	Bottineau	Burke	McHenry	Mountrail	Pierce	Renville	Ward	
	Permanent Population <sup>a</sup>							
2010	6,429	1,968	5,395	7,673	4,357	2,470	61,675	89,967
2011	6,443	2,033	5,505	8,097	4,375	2,490	64,072	93,015
2012	9,034	2,669	6,451	10,515	4,638	3,076	65,000	101,382
2013	9,155	2,695	6,549	10,855	4,687	3,112	66,213	103,266
2014	9,276	2,721	6,646	11,202	4,736	3,147	67,432	105,159
2015	9,399	2,747	6,746	11,561	4,785	3,184	68,687	107,109
2016	9,562	2,782	6,866	11,981	4,859	3,238	70,463	109,750
2017	9,714	2,814	6,978	12,397	4,927	3,288	72,187	112,305
2018	9,929	2,863	7,135	12,905	5,026	3,359	74,406	115,622
2019	10,101	2,899	7,262	13,371	5,104	3,416	76,345	118,498
2020	10,166	2,904	7,312	13,703	5,127	3,436	77,496	120,145
2021	10,254	2,922	7,377	13,947	5,165	3,465	78,497	121,627
2022	10,328	2,936	7,432	14,175	5,197	3,489	79,405	122,961
2023	10,397	2,948	7,483	14,400	5,227	3,512	80,285	124,253
2024	10,457	2,958	7,528	14,613	5,252	3,531	81,094	125,432
2025	10,512	2,966	7,569	14,822	5,274	3,549	81,875	126,567
2026	10,561	2,973	7,607	15,026	5,293	3,564	82,618	127,642
2027	10,606	2,978	7,641	15,226	5,310	3,579	83,334	128,674
2028	10,646	2,981	7,672	15,421	5,325	3,591	84,016	129,652
2029	10,682	2,983	7,699	15,611	5,337	3,603	84,667	130,582
2030	10,713	2,984	7,724	15,798	5,347	3,612	85,293	131,471
2031	10,760	2,993	7,759	15,938	5,367	3,628	85,856	132,302
2032	10,803	3,001	7,791	16,073	5,386	3,642	86,389	133,085
2033	10,842	3,008	7,820	16,203	5,402	3,654	86,892	133,822
2034	10,871	3,012	7,842	16,319	5,414	3,664	87,320	134,442
2035	10,876	3,009	7,846	16,398	5,413	3,665	87,552	134,761
2036	10,909	3,018	7,869	16,447	5,429	3,676	87,813	135,162

- continued -

<sup>a</sup> Population associated with permanent workforce. Population in 2010 represents Census estimates.

Table B8. Continued

Year	State Planning Region 2 Counties							Total
	Bottineau	Burke	McHenry	Mountrail	Pierce	Renville	Ward	
	Service (Permanent and Temporary) Population <sup>b</sup>							
2010 <sup>c</sup>	6,429	1,968	5,395	7,673	4,357	2,470	61,675	89,967
2011	6,443	2,033	5,505	8,097	4,375	2,490	64,072	93,015
2012	10,232	3,023	7,307	11,909	5,253	3,484	73,621	114,828
2013	10,441	3,074	7,468	12,379	5,345	3,549	75,512	117,769
2014	10,557	3,097	7,564	12,749	5,390	3,582	76,746	119,685
2015	10,657	3,115	7,648	13,108	5,425	3,610	77,877	121,440
2016	10,802	3,143	7,756	13,534	5,489	3,658	79,601	123,984
2017	10,914	3,161	7,839	13,928	5,535	3,694	81,099	126,170
2018	11,125	3,208	7,995	14,460	5,632	3,764	83,374	129,558
2019	11,251	3,229	8,089	14,893	5,685	3,805	85,038	131,991
2020	11,265	3,218	8,103	15,185	5,681	3,808	85,874	133,133
2021	11,299	3,220	8,129	15,368	5,692	3,818	86,497	134,022
2022	11,289	3,209	8,124	15,495	5,681	3,814	86,798	134,410
2023	11,166	3,166	8,037	15,464	5,614	3,771	86,220	133,438
2024	11,084	3,135	7,979	15,489	5,567	3,743	85,956	132,953
2025	11,014	3,108	7,931	15,531	5,526	3,718	85,786	132,613
2026	10,974	3,089	7,904	15,614	5,500	3,704	85,850	132,635
2027	10,962	3,078	7,898	15,738	5,489	3,699	86,134	132,997
2028	10,940	3,063	7,883	15,846	5,471	3,690	86,331	133,225
2029	10,923	3,051	7,873	15,964	5,457	3,684	86,582	133,535
2030	10,903	3,037	7,861	16,078	5,442	3,676	86,806	133,804
2031	10,900	3,032	7,859	16,144	5,437	3,675	86,968	134,014
2032	10,886	3,024	7,850	16,196	5,427	3,670	87,052	134,106
2033	10,874	3,017	7,842	16,250	5,418	3,665	87,145	134,210
2034	10,871	3,012	7,842	16,319	5,414	3,664	87,320	134,442
2035	10,876	3,009	7,846	16,398	5,413	3,665	87,552	134,761
2036	10,909	3,018	7,869	16,447	5,429	3,676	87,813	135,162

<sup>b</sup> Population associated with permanent and temporary workforce.

<sup>c</sup> Service population not estimated for 2010. Figures represent 2010 Census population only (U.S. Census Bureau 2012b).

Table B9. Population Estimates, High Scenario, by County, State Planning Region 8, North Dakota, 2010 through 2036

Year	State Planning Region 8 Counties								Total
	Adams	Billings	Bowman	Dunn	Golden Valley	Hettinger	Slope	Stark	
	<u>Permanent Population<sup>a</sup></u>								
2010	2,343	783	3,151	3,536	1,680	2,477	727	24,199	38,896
2011	2,307	816	3,134	3,720	1,752	2,515	718	25,177	40,139
2012	2,201	838	3,330	3,822	1,666	2,438	691	23,500	38,486
2013	2,253	851	3,428	4,007	1,742	2,488	714	24,102	39,585
2014	2,308	864	3,532	4,204	1,822	2,540	739	24,726	40,736
2015	2,366	879	3,643	4,417	1,909	2,596	766	25,388	41,963
2016	2,457	905	3,817	4,641	1,988	2,703	794	26,719	44,024
2017	2,554	933	4,004	4,881	2,071	2,818	825	28,151	46,237
2018	2,665	965	4,217	5,156	2,167	2,950	860	29,782	48,762
2019	2,763	992	4,412	5,410	2,253	3,067	891	31,303	51,092
2020	2,864	1,019	4,617	5,677	2,342	3,189	923	32,899	53,529
2021	2,951	1,046	4,781	5,886	2,417	3,292	951	34,140	55,463
2022	3,040	1,072	4,948	6,101	2,493	3,396	979	35,415	57,444
2023	3,126	1,097	5,112	6,312	2,567	3,497	1,006	36,669	59,386
2024	3,208	1,120	5,271	6,518	2,638	3,595	1,032	37,894	61,275
2025	3,288	1,143	5,429	6,722	2,708	3,690	1,057	39,114	63,151
2026	3,363	1,163	5,580	6,919	2,774	3,781	1,081	40,294	64,955
2027	3,434	1,182	5,727	7,111	2,837	3,868	1,104	41,445	66,708
2028	3,501	1,199	5,868	7,296	2,896	3,949	1,125	42,553	68,387
2029	3,564	1,214	6,003	7,474	2,953	4,027	1,144	43,629	70,009
2030	3,622	1,227	6,131	7,644	3,005	4,099	1,162	44,656	71,547
2031	3,684	1,245	6,252	7,801	3,059	4,174	1,182	45,589	72,985
2032	3,729	1,257	6,344	7,921	3,099	4,228	1,196	46,311	74,085
2033	3,767	1,266	6,425	8,028	3,133	4,275	1,208	46,954	75,057
2034	3,787	1,270	6,476	8,097	3,152	4,301	1,214	47,374	75,671
2035	3,776	1,263	6,474	8,100	3,146	4,293	1,211	47,414	75,676
2036	3,784	1,265	6,486	8,116	3,152	4,301	1,213	47,505	75,822

- continued -

<sup>a</sup> Population associated with permanent workforce. Population in 2010 represents Census estimates.

Table B9. Continued

Year	State Planning Region 8 Counties								Total
	Adams	Billings	Bowman	Dunn	Golden Valley	Hettinger	Slope	Stark	
	Service (Permanent and Temporary) Population <sup>b</sup>								
2010 <sup>c</sup>	2,343	783	3,151	3,536	1,680	2,477	727	24,199	38,896
2011	2,307	816	3,134	3,720	1,752	2,515	718	25,177	40,139
2012	2,843	1,082	4,301	4,937	2,152	3,149	893	30,352	49,709
2013	2,952	1,115	4,491	5,250	2,282	3,260	936	31,575	51,860
2014	3,024	1,132	4,628	5,508	2,388	3,328	968	32,398	53,375
2015	3,103	1,152	4,776	5,791	2,503	3,404	1,004	33,285	55,017
2016	3,212	1,183	4,989	6,066	2,598	3,534	1,038	34,925	57,545
2017	3,327	1,215	5,216	6,359	2,698	3,671	1,075	36,674	60,235
2018	3,468	1,256	5,486	6,708	2,820	3,838	1,119	38,749	63,444
2019	3,592	1,290	5,737	7,034	2,929	3,988	1,159	40,697	66,425
2020	3,720	1,324	5,998	7,374	3,042	4,143	1,199	42,738	69,539
2021	3,823	1,354	6,192	7,624	3,130	4,263	1,232	44,218	71,835
2022	3,900	1,375	6,348	7,827	3,198	4,357	1,256	45,433	73,695
2023	3,894	1,367	6,369	7,863	3,198	4,357	1,254	45,683	73,984
2024	3,891	1,359	6,394	7,906	3,200	4,360	1,252	45,967	74,329
2025	3,896	1,354	6,434	7,966	3,209	4,373	1,253	46,354	74,839
2026	3,921	1,356	6,506	8,067	3,234	4,408	1,261	46,977	75,729
2027	3,959	1,362	6,602	8,197	3,270	4,458	1,272	47,774	76,895
2028	3,980	1,363	6,669	8,293	3,292	4,489	1,278	48,368	77,732
2029	4,010	1,366	6,754	8,409	3,322	4,531	1,288	49,086	78,765
2030	4,018	1,361	6,801	8,480	3,334	4,548	1,290	49,539	79,370
2031	4,030	1,362	6,839	8,533	3,346	4,565	1,293	49,870	79,839
2032	4,020	1,355	6,838	8,538	3,340	4,557	1,289	49,919	79,857
2033	4,004	1,346	6,828	8,532	3,330	4,543	1,284	49,901	79,768
2034	3,982	1,335	6,809	8,514	3,314	4,523	1,277	49,816	79,572
2035	3,953	1,321	6,776	8,478	3,292	4,493	1,267	49,625	79,206
2036	3,941	1,318	6,756	8,453	3,283	4,480	1,263	49,481	78,976

<sup>b</sup> Population associated with permanent and temporary workforce.

<sup>c</sup> Service population not estimated for 2010. Figures represent 2010 Census population only (U.S. Census Bureau 2012b).