

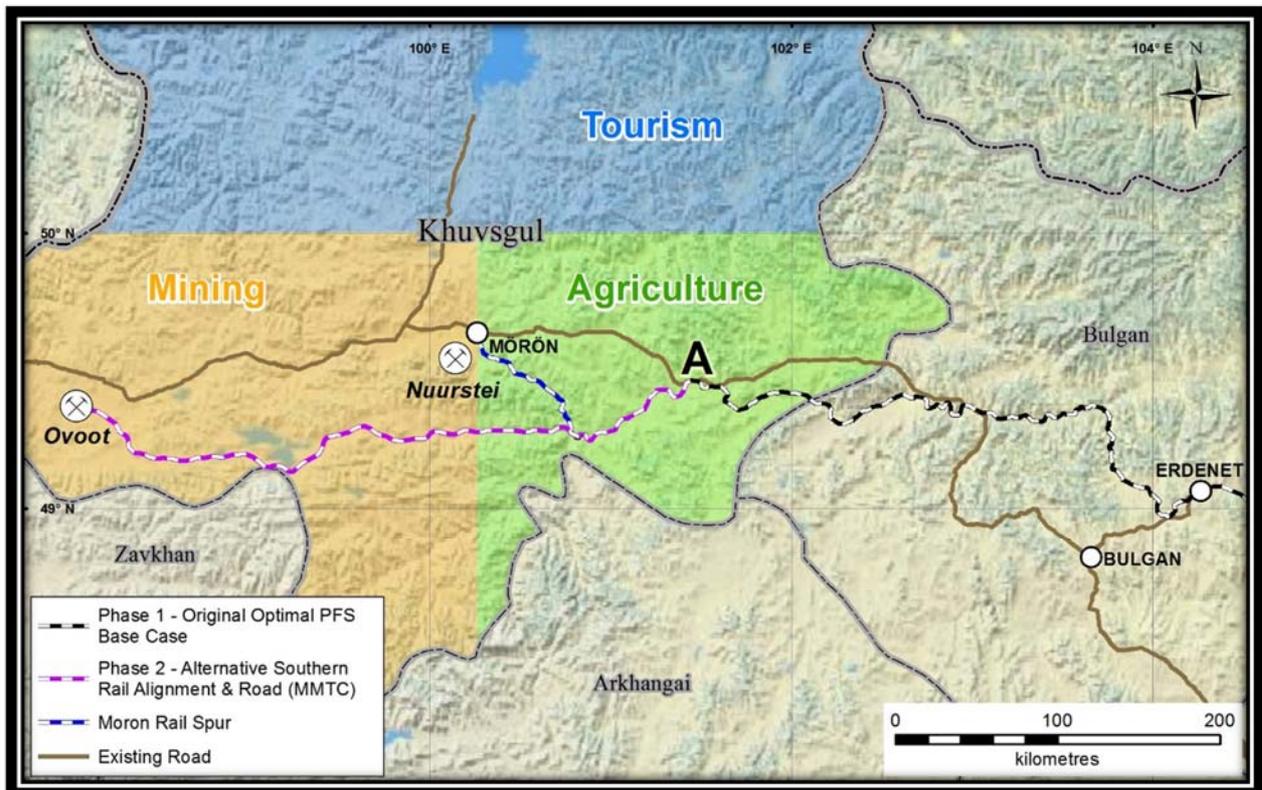


# The Northern Rail Line

## Northern Railways LLC

Northern Railways LLC (“**Northern Railways**”) is a Mongolian registered rail infrastructure company (ID Number 5465141 and Certificate Number 9019049134). Its sole purpose since incorporation in 2011 has been to investigate the feasibility of constructing a multi-user railway in northern Mongolia, to extend the Trans-Mongolian Railway (“**TMR**”) from its current terminus at Erdenet towards the western Provinces.

In February 2012, a Pre-Feasibility Study<sup>Reference6</sup> was completed over a 628 kilometre alignment running between Erdenet – Moron –Tsetserleg by Optimal Project Co., Ltd (“**Optimal**”). The Pre-Feasibility Study was then revised in March 2013 (“**March PFS**”) by Snowy Mountain Engineering Corporation (“**SMEC**”) to account for a change in the alignment to run direct from Erdenet – Ovoot Coking Coal Project in Tsetserleg soum (“**Northern Rail Line**”) (refer Figure 1 below). This revised alignment reduced the total distance of the railway to 595 kilometres, and runs along a flatter terrain south of Moron town by approximately 50 kilometres. The proposed railway can be accessed from Moron by either a rail spur or a road.



**Figure 1: Rail Alignment between Erdenet – Ovoot Project in Tsetserleg Soum March 2013**

The Khuvsgul Provincial Government has divided the province into sectors according to their overall plan for economic development (refer Figure 1)<sup>Reference1</sup>. Land located north of the 50<sup>th</sup> parallel (in blue) has been classified for tourism development. Land located to the west of Moron town has been classified as agricultural land (in green) and land to the east of Moron has been classified as available for mining development (in yellow). Providing railway access to stimulate industry, and in particular the mining sector, will have flow on benefits to support a sustainable agriculture and tourism industry which has been seen in the Orkhon province discussed later in this document.

The Northern Rail Line alignment will pass through four north Mongolian provinces: Orkhon, Bulgan, Khuvsgul and Zavkhan. Within the Khuvsgul province, the Northern Rail Line lies 120 km south of the defined tourism zone<sup>Reference1</sup> and 220 km south of Khuvsgul Lake. Its design is wide gauge (1520mm) that will allow the Northern Rail Line to connect seamlessly with the TMR, and will have the capacity to move 22 million tonnes per annum (“**Mtpa**”) of bulk commodities, agricultural, general and passenger freight which could include materials such as iron ore, coal, meat, animal skins/hide, wool, cashmere, potatoes, wheat, barley, milk, eggs, bricks and other materials which are produced from these agriculturally rich provinces.

Northern Railways has appointed SMEC to complete a full re-optimisation of the entire Erdenet – Ovoot rail alignment which will include site visits, risk and constraint analysis, permitting and Government approvals including a rail concession, engineering and design. This work will allow for the next stages of development of the railway to include EPC tendering and completion of a Bankable Feasibility Study. It is anticipated by Northern Railways that the Northern Rail Line would be constructed and in operation by 2016.

### **Northern Mongolian Provinces**

North Mongolian provinces are some of the most heavily populated in the country (refer Figure 2). However, they currently lack crucial infrastructure which could be a significant factor of migration from the region which is highlighted in Figures 2 and 3. For example Khuvsgul and Bulgan provinces population density fell between 2010 and 2012.

Feedback received<sup>Reference2</sup> from discussions with members of the Bulgan, Orkhon and Khuvsgul provinces have been positive with outstanding support for the railway, which is believed will increase economic activity in the region through the creation of employment opportunities, logistic transport options for goods and services, migration into the region, and increased flow of tourism.

The extension of the Trans-Mongolian Railway into the northern Mongolian provinces will open up an array of opportunities for small business development, agricultural expansion, and income improvement through:

- Providing a transport alternative for agricultural products and general freight which is cheaper, efficient, and environmentally friendly;
- Rebalance exports by opening up accessibility to seaborne markets through Russia;
- Provide employment opportunities during construction and operation of both the Ovoot mine and Northern Rail Line;
- Encourage migration into northern Mongolia;
- Support the development a secondary manufacturing industry for the processing of raw materials including meat, milk, wool and cashmere; and
- Generate royalties to support local Provincial growth.

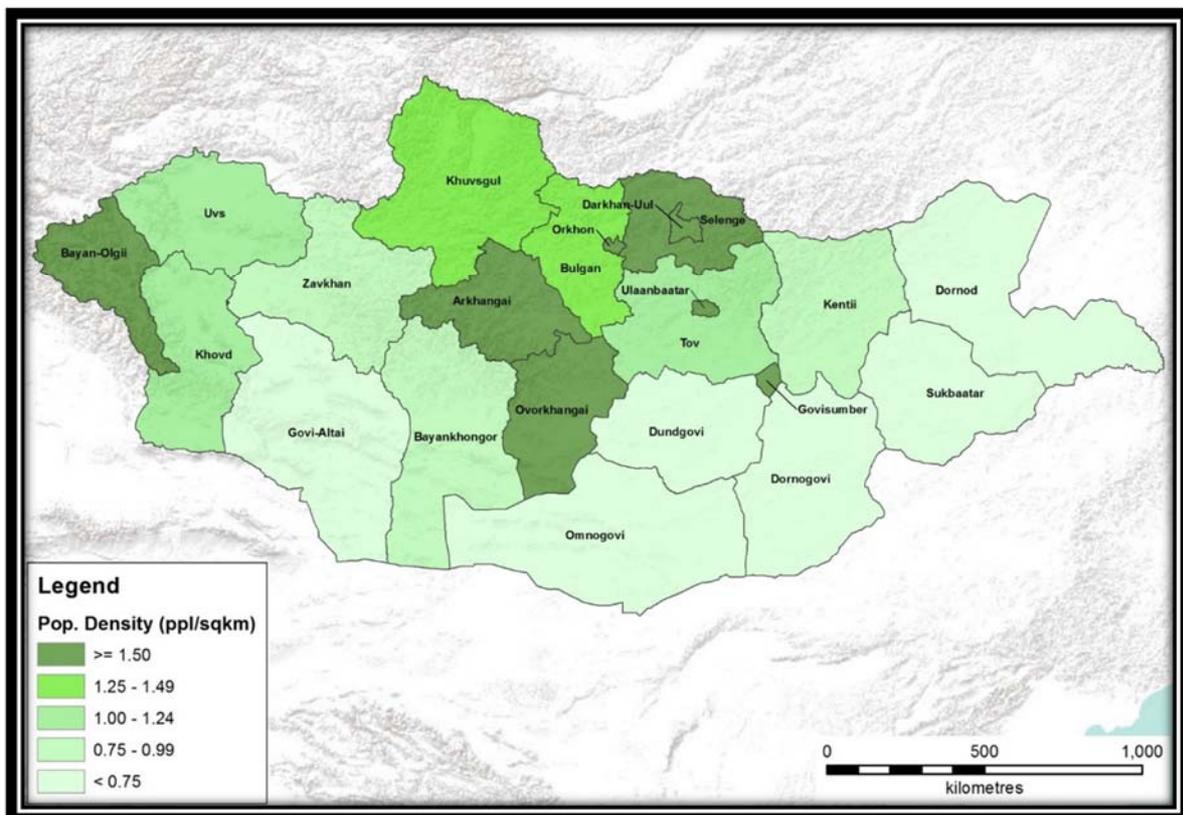


Figure 2: 2010 Population Density by Aimag <sup>Reference8</sup>

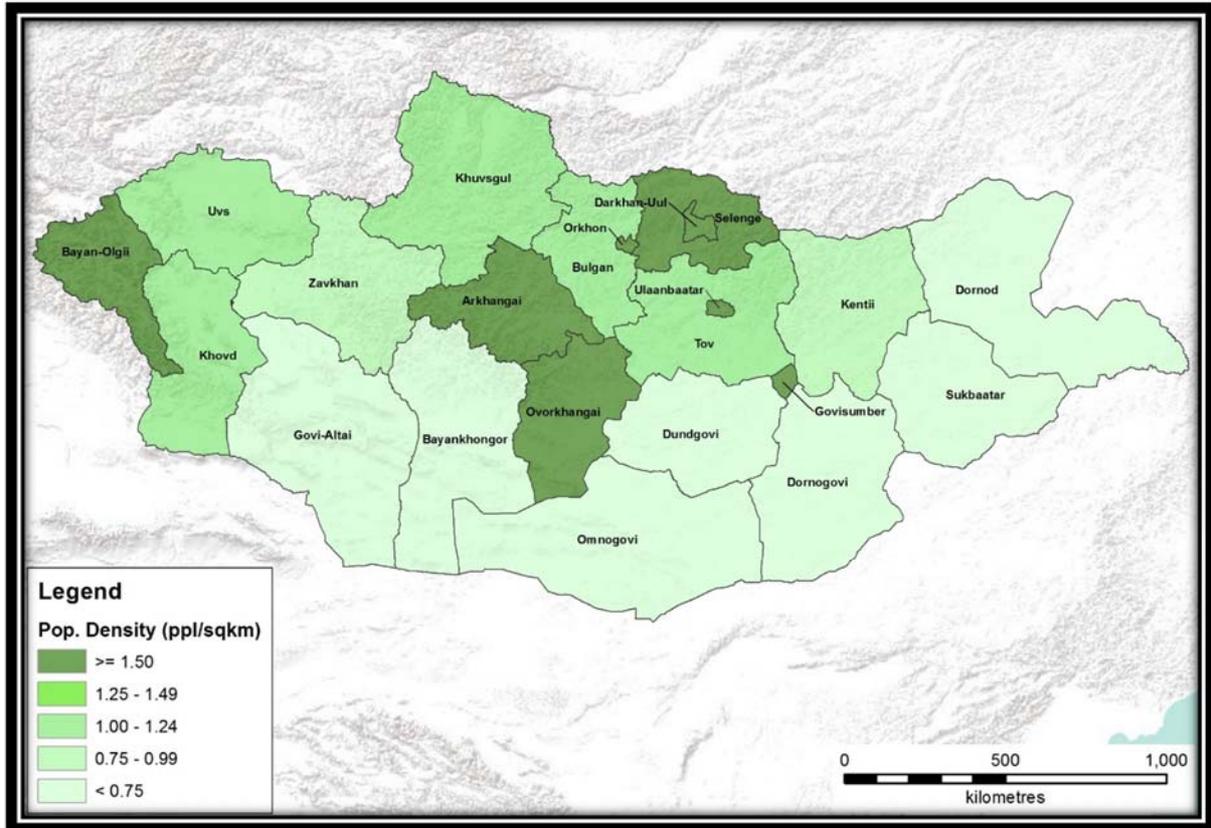


Figure 3: 2012 Population Density by Aimag <sup>Reference10</sup>

## Khuvsgul Province

The Khuvsgul province is Mongolia's most populated province. Agriculture, in particular livestock husbandry, is its primary contributor to provincial GDP accounting for 70% (2012 data).

Located in the north, the Khuvsgul province attracts a large number of tourists each year. One of its most popular attractions is the Khuvsgul Lake, located close to the Russian border. Other tourist attractions within Khuvsgul include travelling to Taiga to see reindeer herds. It is not uncommon for tourists to then visit nearby provinces such as Arkhangai where other attractions include a visit to the white lake of Terh and staying at hot-spring campsites.

Statistics for 2012 however point out that the Khuvsgul province is lagging in terms of development when compared to national data and other Mongolian provinces. This lag is predominately driven by the economy's dependence on the natural environment, population migration from the region in search of jobs and lack of infrastructure to support the expansion of local industries. Khuvsgul's industry, which includes manufacturing, mining/quarrying, electricity and water supply accounts for only 0.1% of national sales of industrial products <sup>Reference10</sup>. Access to railway would support the development of the manufacturing industry to produce food,

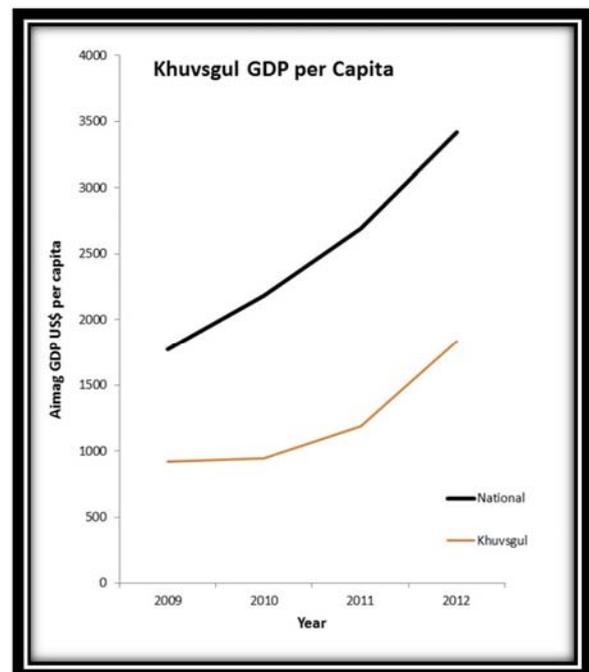
beverages, textiles, clothing, paper, construction materials, and wood products could see significant growth in the development of the Khuvsgul industrial sector.

Key indicators of human welfare including the human development (“HDI”), life expectancy and education indices, unemployment rate and GDP per capita fall short of the national average, and whilst national figures were increasing from 2010-2011, a majority of the Khuvsgul indicators fell. Khuvsgul saw an improvement during 2012 with the exception of unemployment which increased significantly from 9.1% to 15.2%<sup>Reference 10</sup>.

Welfare Indicators		
	National	Khuvsgul
Human Development Index (HDI)	0.778	0.709
Life Expectancy	0.728	0.651
Education	0.940	0.914
GDP/capita (US\$)	\$3,417	\$1,843
GDP/capita (MNT)	4,862,516	2,610,756
Unemployment	8.2%	15.2%

**Table 1: 2012 Khuvsgul Key Welfare Indicators**

Reference 10



**Figure 3: Comparison of Khuvsgul and National GDP per capita**

During preliminary discussions with respect to the development of the Northern Rail Line<sup>Reference2</sup>, and feedback received from a study completed in 2012 by Arvin AG LLC<sup>Reference4</sup> it was highlighted that the Tarialan and Ikh-Uul soums would like to transport wheat, flour and other agricultural products to Erdenet, and the Tsetserleg soum community were concerned with how to improve livestock care and survival.

Many community members also voiced the importance to ensure the preservation of Lake Khuvsgul, however the most concern was in relation to the need to provide more employment opportunities.

The availability of a railway would allow for the transport both east and west of agricultural raw materials, and cattle breeding products to already established processing plants between Erdenet and Tseterleg<sup>Reference6</sup>. Providing access to rail, which would be a reliable source of transport year round, could improve availability of hay/fodder for livestock, particularly during the cold winter

months. Hay, grain and other livestock feed would be more easily accessible and delivered quicker and cheaper by rail than by road. Livestock would be able to be sold at nearby cities and towns located along the Northern Rail Line.

## Bulgan Province

The Bulgan province displays some similarities to that of Khuvsgul. Agriculture is its primary industry accounting for 77.1% of GDP in 2012<sup>Reference10</sup>. Bulgan is Mongolia's third largest producer of cereals, producing 45,917 tonnes in 2012<sup>Reference10</sup>, and is also ranked as one of the top five provinces for head of cattle, horse, and sheep livestock. The Bulgan province attract tourists wishing to visit the Urantogoo volcanic mountain.

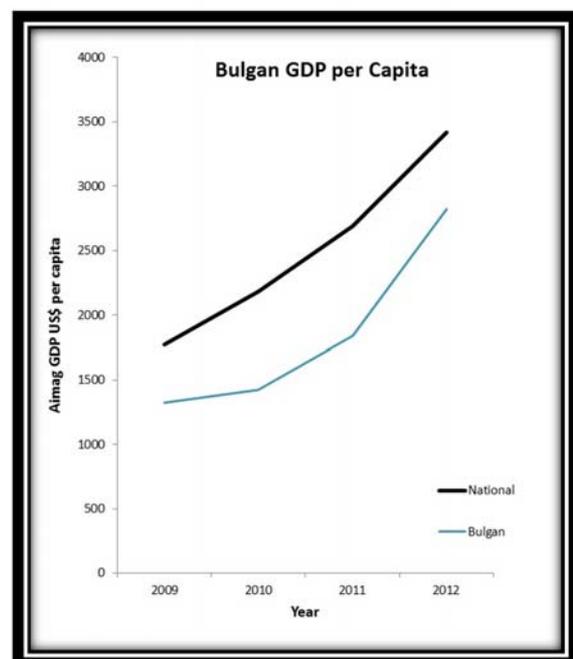
With the exception of life expectancy, the key welfare indicators as shown in Table 2 below lag behind the national figures.

The Bulgan provinces' main concerns relate to its high unemployment rate. Feedback received from its community members support the development of rail infrastructure which is believed would assist the growth of its tourism industry and support economic development<sup>Reference2</sup>.

Access to railway is seen as critical to sustain the development of processing plants for raw materials and building industrial parks<sup>Reference6</sup> which could provide the necessary support for the growth of Bulgan's industry, which in 2012 contributed just 0.16% to Mongolia's total sales of industrial products<sup>Reference10</sup>.

Welfare Indicators		
	National	Bulgan
Human Development Index (HDI)	0.778	0.770
Life Expectancy	0.728	0.771
Education	0.940	0.905
GDP/capita (US\$)	\$3,417	\$2,822
GDP/capita (MNT)	4,862,516	4,016,697
Unemployment	8.2%	9.1%

**Table 2: 2012 Bulgan Key Welfare Indicators**  
Reference 10



**Figure 6: Comparison of Bulgan and National GDP per capita**

## Zavkhan Province

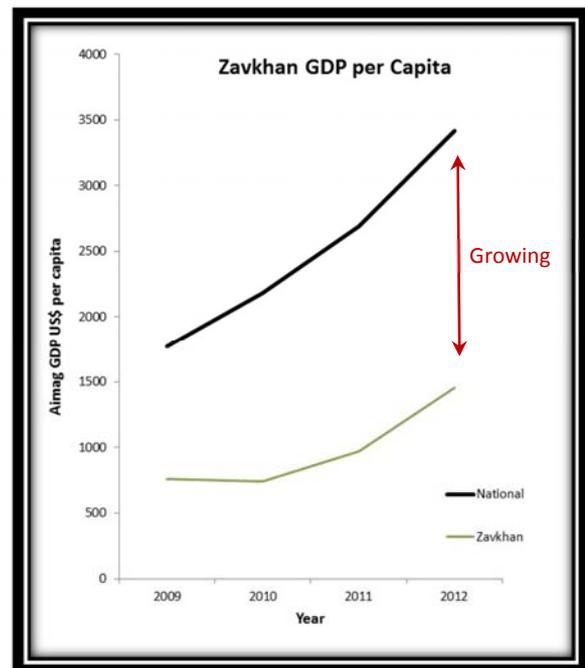
The alignment of the Northern Rail Line crosses into the northernmost point of the Zavkhan province, and could potentially provide rail access for a number of communities.

Agriculture is the primary industry of the Zavkhan province accounting for 52.5% of GDP in 2012 with the other main contributor being services <sup>Reference10</sup>. Like Khuvsgul, Zavkhan relies heavily on the natural environment for its livelihood and saw a significant decrease in livestock between 2009 and 2010. During the same period, the Zavkhan unemployment rate saw a dramatic increase of 230% (refer Figure 4). Unemployment in the region has been volatile with Zavkhan reported the highest provincial unemployment rate in the whole of the Country at 18.2% during 2011 before reducing to below the national average to 6.4% in 2012 (refer Table 3).

GDP per capita for Zavkhan province also is lagging severely behind the national average, as are indices for life expectancy and human development which indicates the poverty of the region.

Welfare Indicators		
	National	Zavkhan
Human Development Index (HDI)	0.778	0.731
Life Expectancy	0.728	0.720
Education	0.940	0.949
GDP/capita (US\$)	\$3,417	\$1,452
GDP/capita (MNT)	4,862,516	2,035,900
Unemployment	8.2%	6.4%

**Table 3: 2012 Zavkhan Key Welfare Indicators**  
Reference 10



**Figure 4: Comparison of Zavkhan and National GDP per capita**

**ORKHON PROVINCE**

The Orkhon province economy flourishes as compared to its neighboring provinces. Industry and construction accounts for 90.4% of GDP (2012 data) which is a direct influence of the Erdenet Mining Corporation, a Mongolian-Russian joint venture<sup>Reference6</sup>. The Erdenet Mining Corporation produces approximately 530 ktpa of copper concentrate and 3 ktpa molybdenum concentrates from its copper and molybdenum processing plant. The province has an established manufacturing industry also producing goods such as carpet, food and beverages. 20.8% of national industrial sales occurs from within the Orkhon province<sup>Reference10</sup>.

Orkhons’ primary tourist attraction is the Amarbayasgalant monastery, which is one of few monasteries that has not been destroyed throughout Mongolian history.

Although welfare indicators for the province sit mostly above the national averages, unemployment in the province remains high. Orkhon is fully supportive of the Northern Rail Line as it already realises the benefits that the exiting TMR brings to its local industry<sup>Reference2</sup>. Reducing unemployment is the provinces’ main concern and it is anticipated that the construction and operation of the Northern Rail Line would open up employment opportunities for its younger population and re-attract residents back to the region.

The Orkhon services industry, which currently accounts for 8.1% of Provincial GDP<sup>Reference10</sup>, could also see a boost in activity to province which would support the migration back into the Province.

Welfare Indicators					
	National	Orkhon	Khuvsgul	Zavkhan	Bulgan
Human Development Index (HDI)	0.778	0.853	0.709	0.731	0.770
Life Expectancy	0.728	0.747	0.651	0.720	0.771
Education	0.940	0.969	0.914	0.949	0.905
GDP/capita (US\$)	\$3,417	\$9,900	\$1,843	\$1,452	\$2,822
GDP/capita (MNT)	4,862,516	14,037,920	2,610,756	2,035,900	4,016,697
Unemployment	8.2%	14.2%	15.2%	6.4%	9.1%

**Table 4: 2012 North Mongolian Provinces Key Welfare Indicators Compared to National**<sup>Reference10</sup>.  
 NB: Red numbers are below national averages, green are above national averages.

Resource development and rail access has brought numerous economic benefits to Erdenet and Orkhon province. Establishment of services such as power, water and roads has attracted other industries to Erdenet such as cashmere milling and light engineering. Could Moron be the next Erdenet?

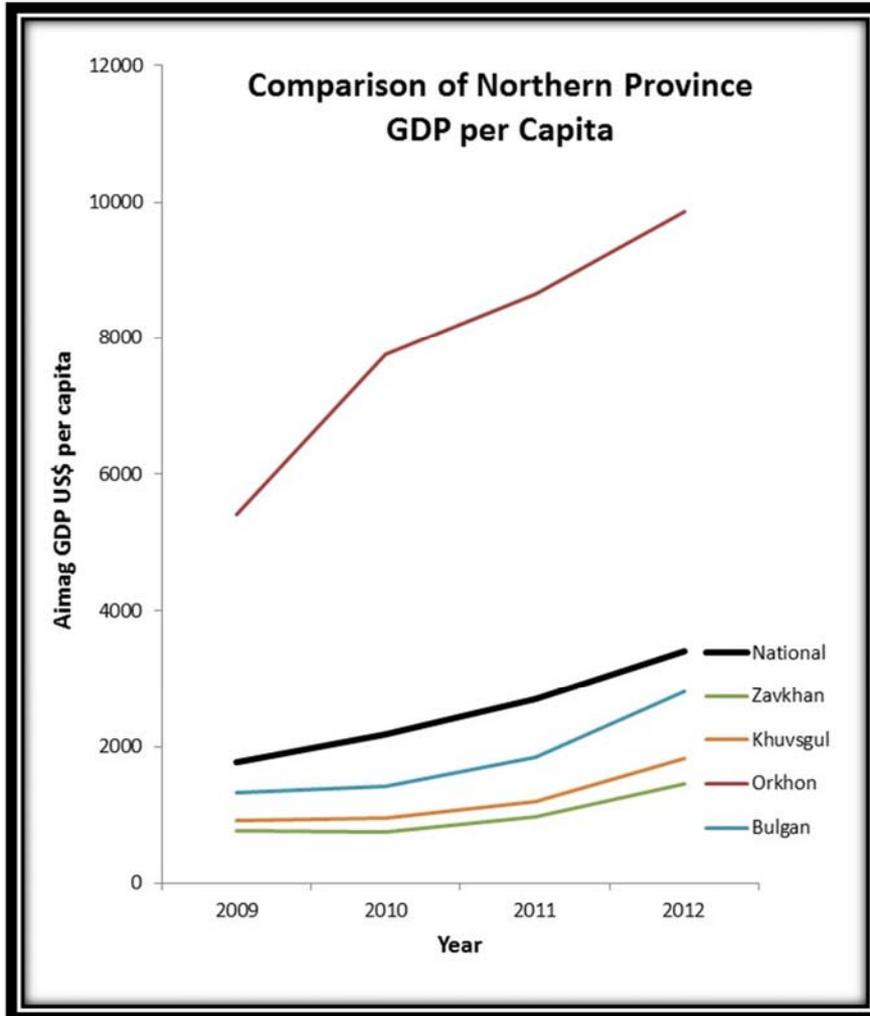


Figure 5: Comparison of Northern Mongolian Provinces and National GDP per capita

## OMNOGOVI PROVINCE

The Omnogovi province is located in the south of Mongolia and attracted a significant amount of investment into the Aimag (aka province) since 2009 when global mining giant, Rio Tinto, agreed with the Mongolian Government to develop the Oyu Tolgoi Project (“OT”) which, at full operation would produce copper, gold, silver and molybdenum. Since 2009, investment has been made into local infrastructure, including the construction of roads, airstrip, and access to power and water. Direct employment opportunities have been created at both Oyu Tolgoi Project and within the local industry itself which the OT project is using to assist in the construction of the required infrastructure.

The activity since 2009 in the province has been significant in preparation for mining activities at Oyu Tolgoi to commence in mid-2013. Other mining projects located in the Omnogovi province also include Mongolian Mining Corporation’s Ukhua Khudag (“UHG”) mine which commenced

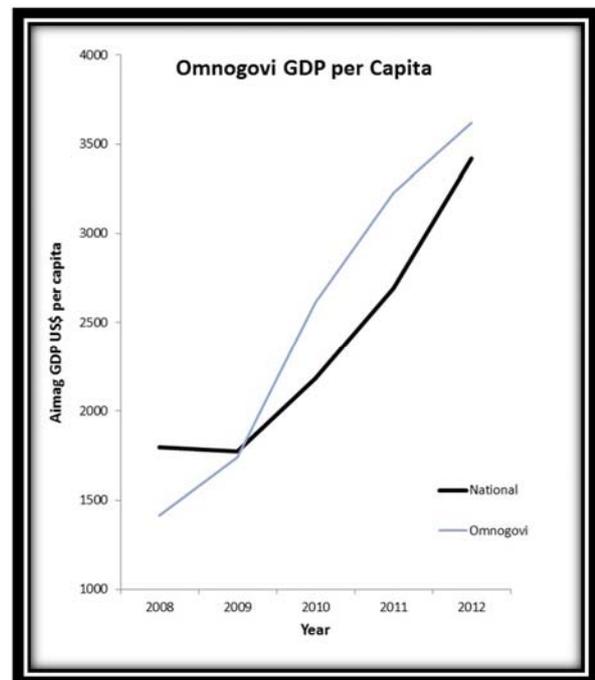
coal mining operations in 2010 and the Government owned Tavan Tolgoi project which started exporting coal to China in 2011.

GDP per capita rose sharply between 2009 and 2010 by 50.2% as can be seen in Figure 7. A majority of this growth has been driven by development of the industry, manufacturing and construction sector which has increased 26% from 47.6% of GDP in 2008 to account for 60.1% of GDP in 2012. Sales of industrial goods produced from manufacturing, mining/quarrying and electricity and water supply almost tripled from 2009 (175,124m MNT) to 2011 (514,566m MNT)<sup>Reference7</sup>.

The increased activity through the development of infrastructure has had considerable flow on benefits to support the growth of Omnogovi's manufacturing industry i.e. brick manufacturing, boiler making, textiles, clothing production, food and beverages, wood products and more.

Welfare Indicators		
	National	Omnogovi
Human Development Index (HDI)	0.778	0.786
Life Expectancy	0.728	0.757
Education	0.940	0.924
GDP/capita (US\$)	\$3,417	\$3,630
GDP/capita (MNT)	4,862,516	5,147,630
Unemployment	8.2%	6.5%

**Table 5: 2012 Omnogovi Key Welfare Indicators**  
Reference 10



**Figure 7: Omnogovi GDP per capita reaction in heightened investment**

## Northern Rail Line as Part of the Mongolian National Transport Plan

The Northern Rail Line is not currently included as part of the Mongolian railway sector development according to the State Policy on Railway Transportation<sup>Reference9</sup> (refer Figure 8). The future railway development plan consists of various stages of investment of rail infrastructure for Mongolia:

- Stage 1: To build the Tavan Tolgoi Railway,
- Stage 2: To upgrade the current north-south Trans-Mongolian railway from, and
- Stage 3: To connect western Mongolia and the Govi region.

The proposed Northern Rail Line fits in well with the third stage of development which could, in time, be extended to connect the Stage 3 western Mongolian rail line.

The completion of Stage 2 upgrades on the north-south TMR would open up more capacity for future transport of products. A clear, reliable logistics solution would also support the development of several mining projects in northern Mongolia. Having access to rail infrastructure increases the attractiveness of surrounding land for mineral exploration growth, by providing a clear path to market for delivery to end customers. From the point of view of foreign investors, this transport risk is minimised and the feasibility of a mining project becomes more realistic.

The Orkhon province, which is currently within accessible distance from the Erdenet rail siding is a good example of how rail infrastructure can provide the economic benefits to its economy. Its GDP per capita is higher than its neighboring provinces (refer Table 6). Many herders, and other businessmen in the northern region are not realising the same prices for their products as other provinces mainly due to distance from rail and the cost of transport to move goods to major trading cities such as Erdenet, Darhan and Ulaanbaatar. Currently, most herders sell their products to “change men” (aka middlemen) who then arrange for the products to be delivered at the larger cities which attract a higher price.

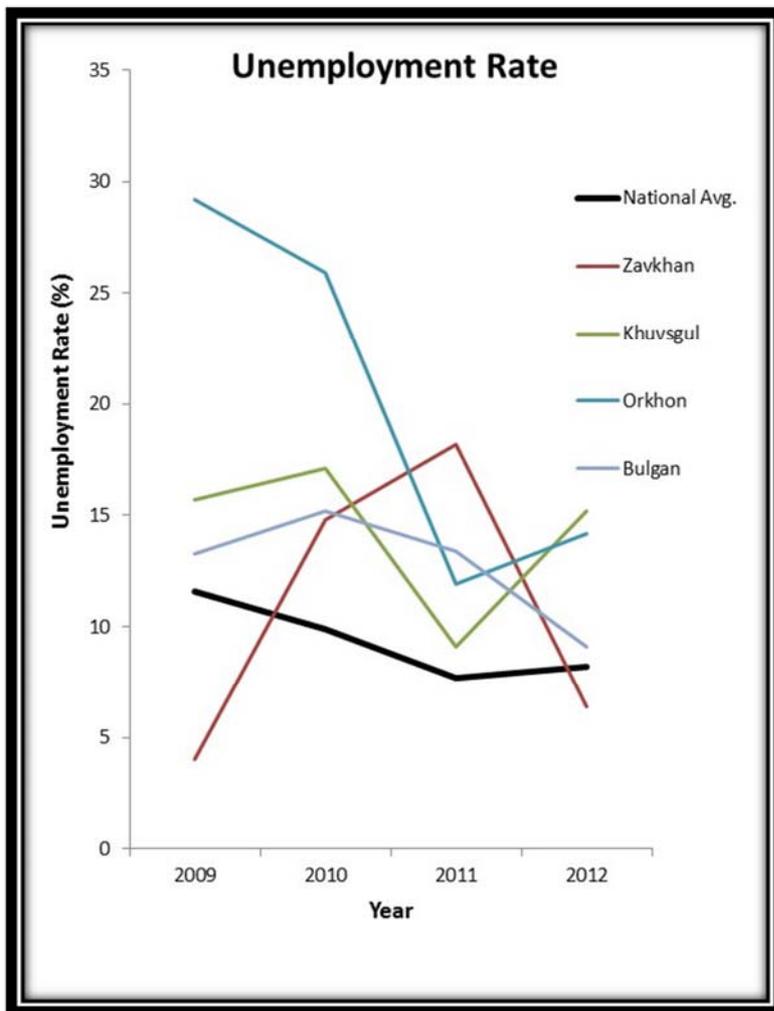
For example, the market price for cattle skins received by Khuvsgul herders were 1,000-2,000 tugriks less than those prices received by herders within Orkhon and Arkhangai<sup>Reference5</sup>. Bulgan herders received on average 500-1,000 tugriks less<sup>Reference5</sup>. Table 6 below shows the average price received during September 2009, August 2010 and September 2010 and highlights that the further the distance to rail, the less received by herders for their skins.

Cattle Skin	< 2m in length Price MNT	> 2m in length Price MNT
Orkhon	9,000	16,000
Bulgan	8,000	13,600
Khuvsgul	6,000	10,500

**Table 6: Average Prices received for cattle skins** <sup>Reference3</sup>

Likewise, the transport of cashmere from the northern provinces will be cheaper by rail, increasing the profitability margins for Herders and enabling greater investment into improving the quality of cashmere products. Reducing the cost structure of cashmere production in Mongolia will lead to a more sustainable industry.

Additionally, the creation of long term stable employment opportunities in areas including transportation (during construction and operation of the railway), manufacturing and services industry (production of clothing, textiles, construction materials such as bricks, food and accommodation), tourism, and resources industry will stabilize the current volatility in unemployment as shown in Figure 9.



**Figure 9: Employment in Northern Mongolian Provinces are Unstable**

The Trans-Mongolian Railway connects to rail networks in both Russia and China. According to information received from UBTZ, the TMR has current available capacity to move 10 Mtpa heading north, and 3-4 Mtpa south. Cost plans are in place to increase line capacity heading south from 18 to 28 Mtpa which would equate to 13 Mtpa available capacity heading south once

upgrades are complete. Recent discussions with Russian Railways has highlighted plans to increase the TMR capacity to 80 Mtpa and establish it as a major trade corridor between Russia and China.

The connection of the Northern Rail Line at Erdenet would allow transport in both directions, ensuring that the additional capacity is utilised and assists to bring the north Mongolian Provinces in line with national economic growth and prosperity.

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PREPARED BY

**Northern Railways LLC**

Sukhbaatar District, 1st Khoroo

Chinggis Ave-8, Altai Tower, 3rd Floor, Room 302

Ulaanbaatar

Date: July 2013

Phone: +976 7011 6828

Facsimile: +976 7011 6826

Email: [info@northernrailways.mn](mailto:info@northernrailways.mn)

Website: [www.northernrailways.mn](http://www.northernrailways.mn)