2015-2036

MMM – City Wide Integrated Public Transport Plan

Annexure A - F

INTEGRATED
PUBLIC
TRANSPORT
NETWORK

MMM IPTN Team
09 September 2019
Revision 6.0

MANGAUNG
AT THE HEART OF IT ALL

Content

Figures

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Tables

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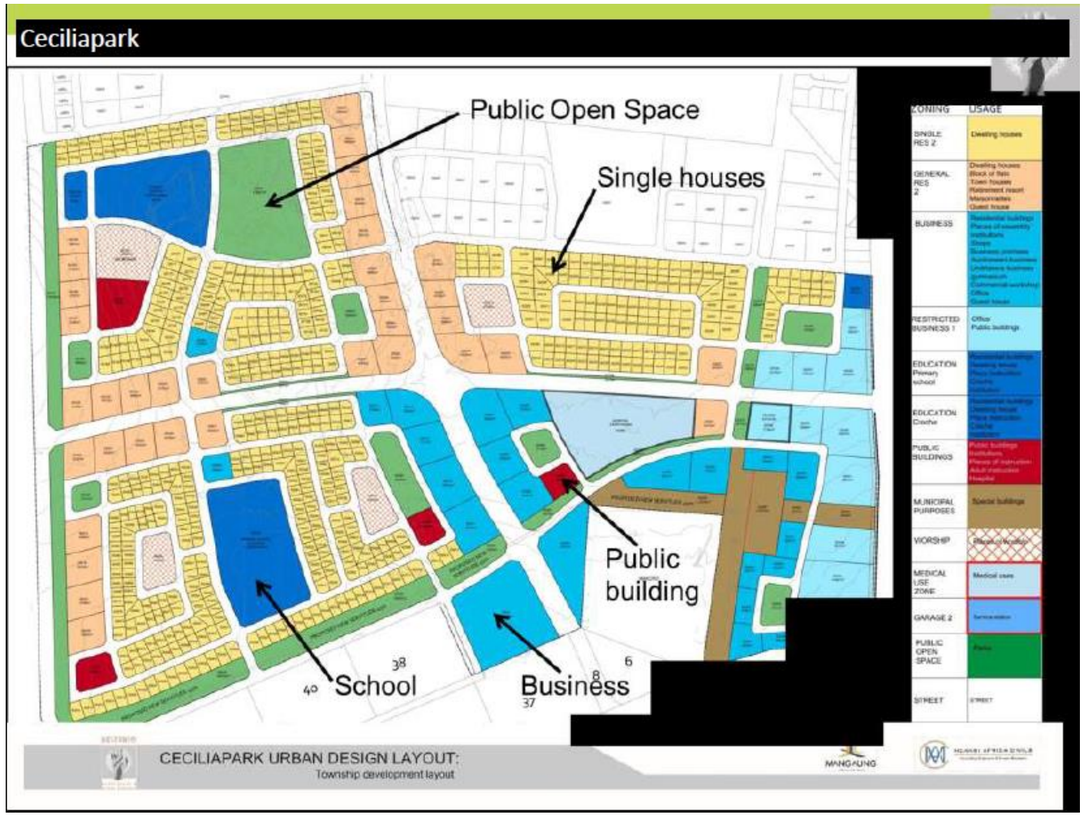
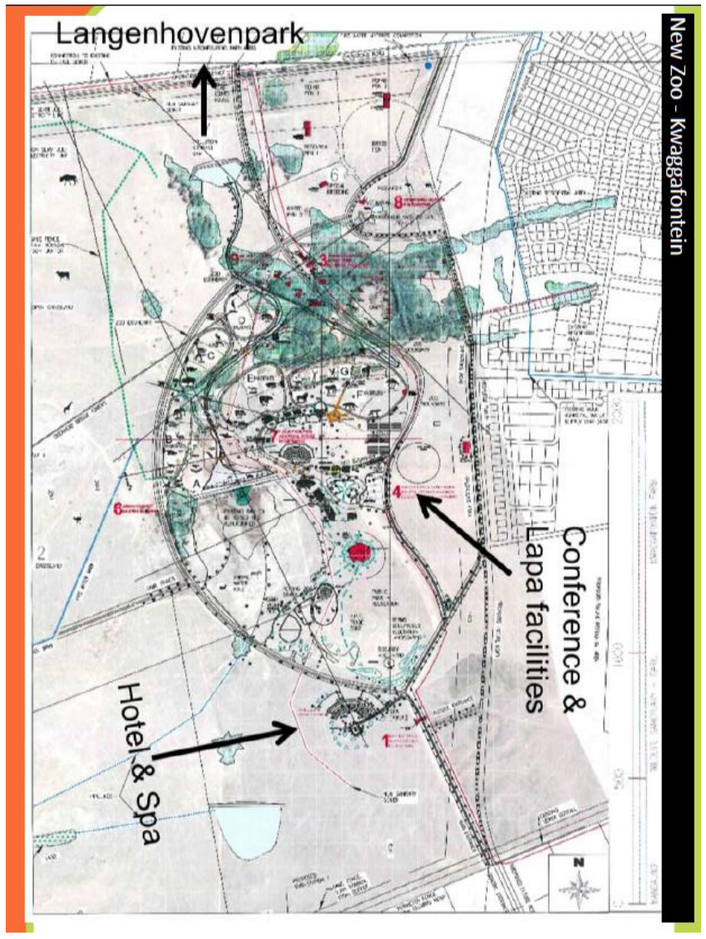
A Annexure A DETAIL MAPS AND LAYOUTS OF NEW DEVELOPMENTS

A.1 Ceciliapark/New Zoo



A.2 Langenhovenpark

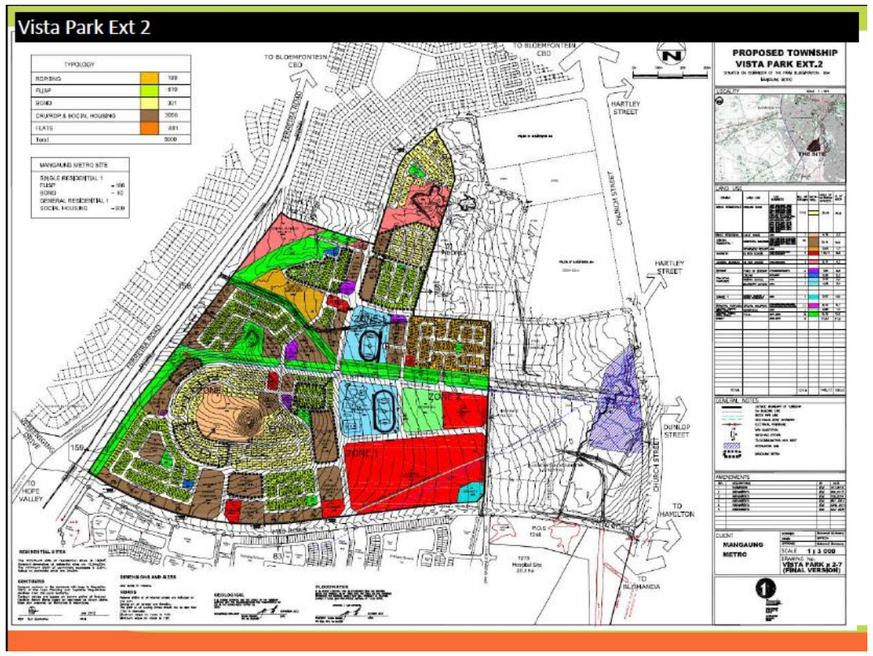


A.3 Brandkop

Brandkop

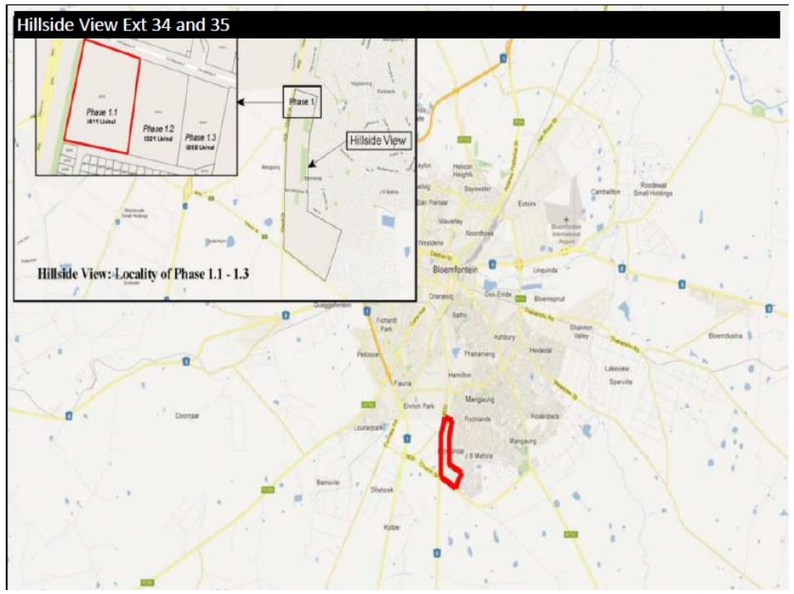
A.4 Visa Park

Vista Park Ext 2



Vista Park Ext 3

Hillside View Ext 34 and 35

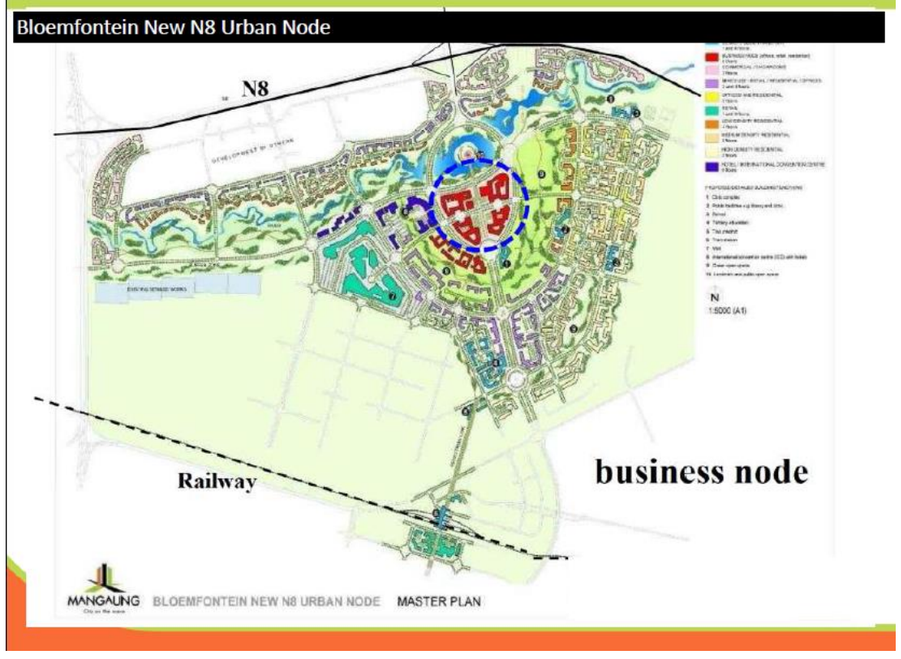


A.5 Silver and Dark City

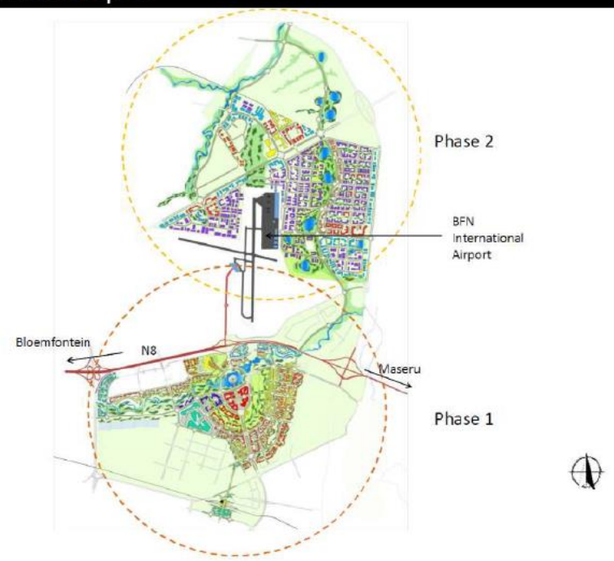
Dark & Silver City/New high density development

A.6 Airport Node

Bloemfontein New N8 Urban Node

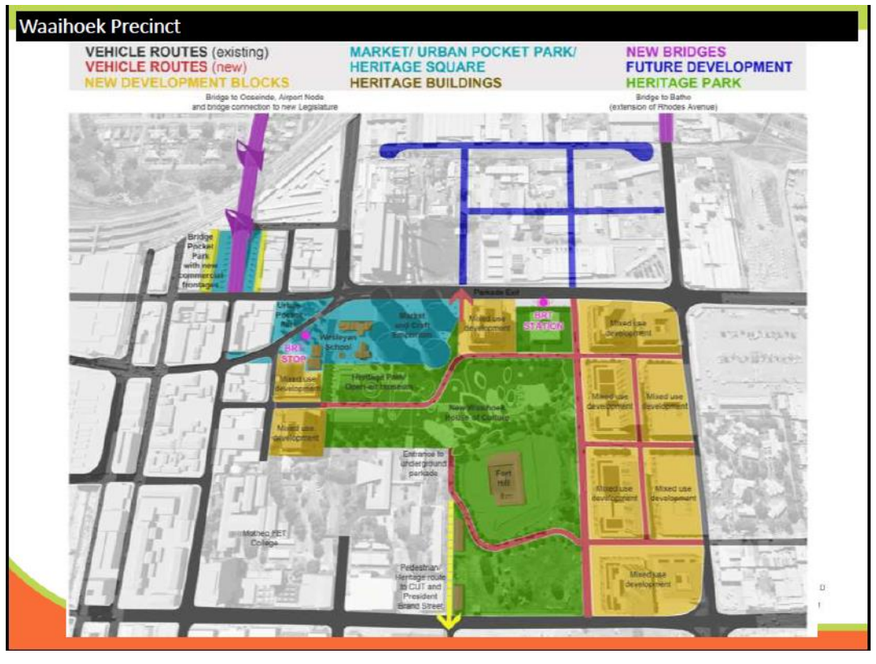


N8 Airport Node: Master Plan Proposal

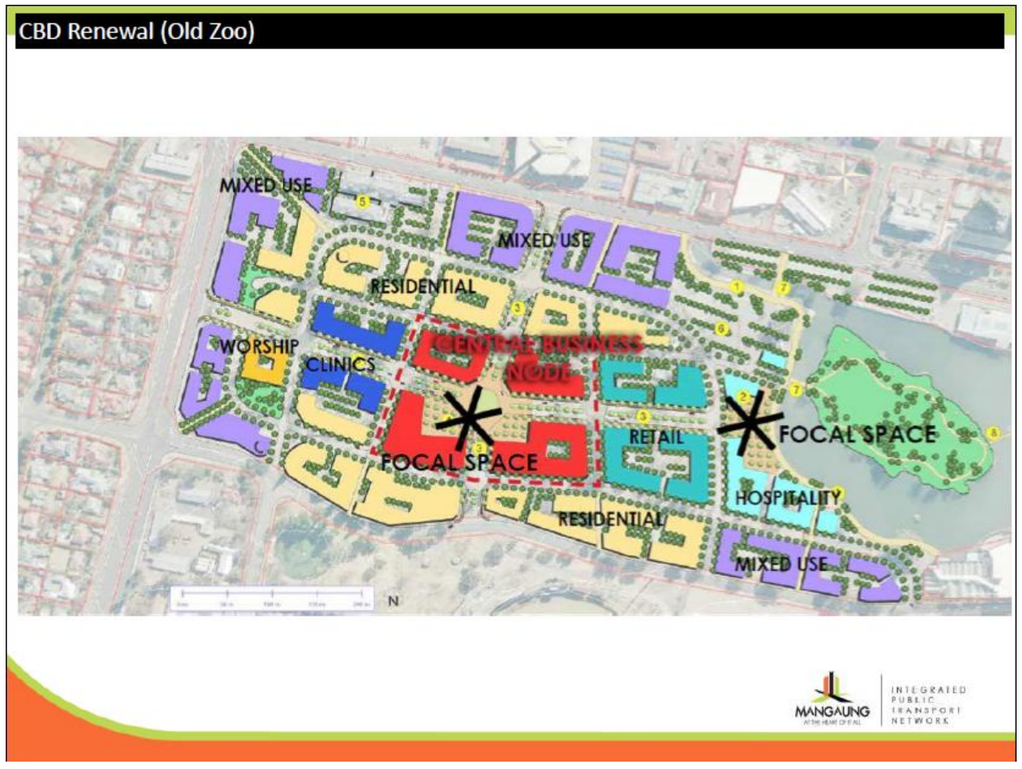


A.7 Waaihoek

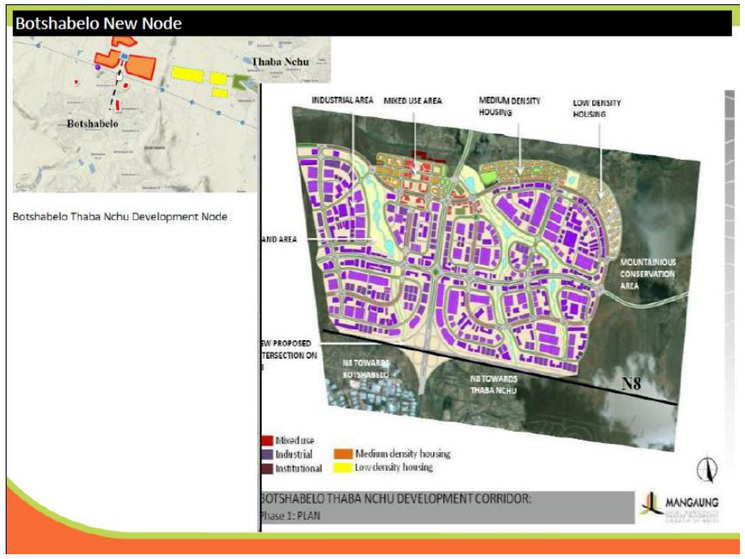
Waaihoek Precinct



A.8 CBD Old Zo Development



A.9 Botshabelo New Node



B Annexure B - Background to Demographic Projections and Economic Forecasts

In order to plan for the future, one needs to have a picture of what the future might hold, both on the human and business side - in terms of population projections and forecasted economic growth. An external (non-transport) perspective to feed into the Mangaung Integrated Public Transport Network, is required and will form the backdrop to the rest of the Mangaung IPTN planning activities. These projections are used as an input into the demographic and economic growth projections.

The importance of the integrated approach is best demonstrated by looking at the following two areas with two opposing trends. One tells the story of a booming town, the other the story of a dying town. But lets first look at the platinum industry. For the past 20 years, platinum has been a growing mining sector, both in terms of platinum output, and also the employment in the platinum mining industry (Diagram B-1).

But exactly the opposite is true for the gold mining industry. The gold mine industry had its peak many years ago, and we are now in the phase where a lot of the gold mine shafts are getting too deep to be economic and financially viable. The reefs of gold left are of a lower grade, resulting in lower yields, and higher costs to mine. And therefore, a lot of these mines are closing down, or have closed down in the past number of years. Diagram B-2, below highlights the declining trend in both production and gold mining employment from 1980 to 2012. There the gold mines employed more than half a million of people in the 80's, this decline to just more than 100,000 today.

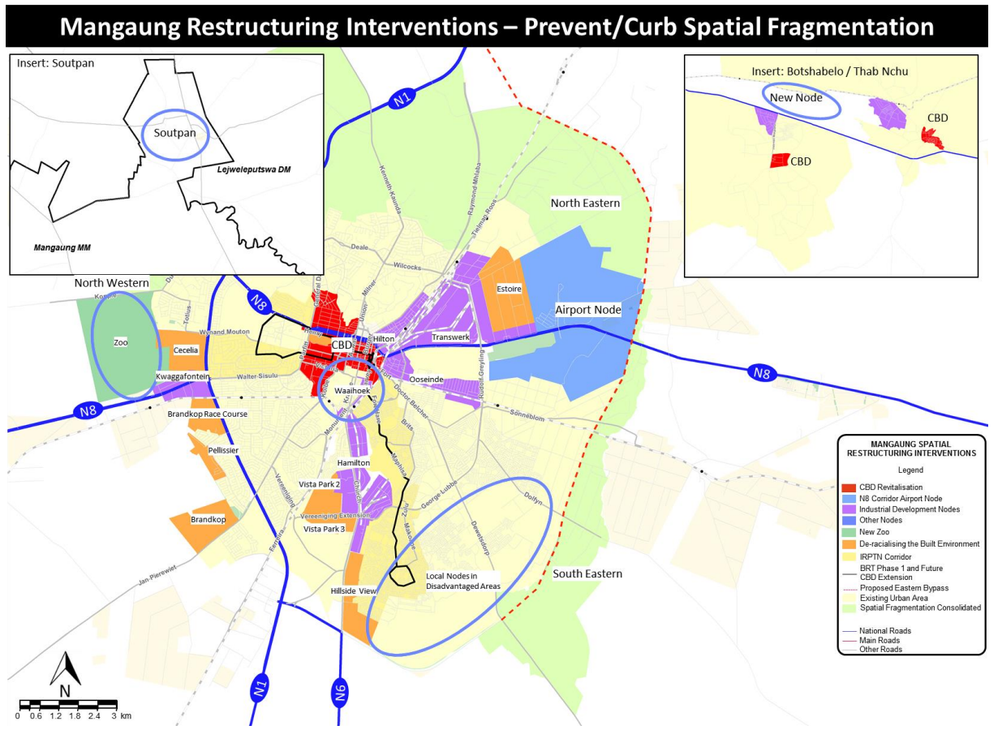


Figure B-1: Mangaung Restructuring Interventions - Prevent Curb/Spatial Fragmentation

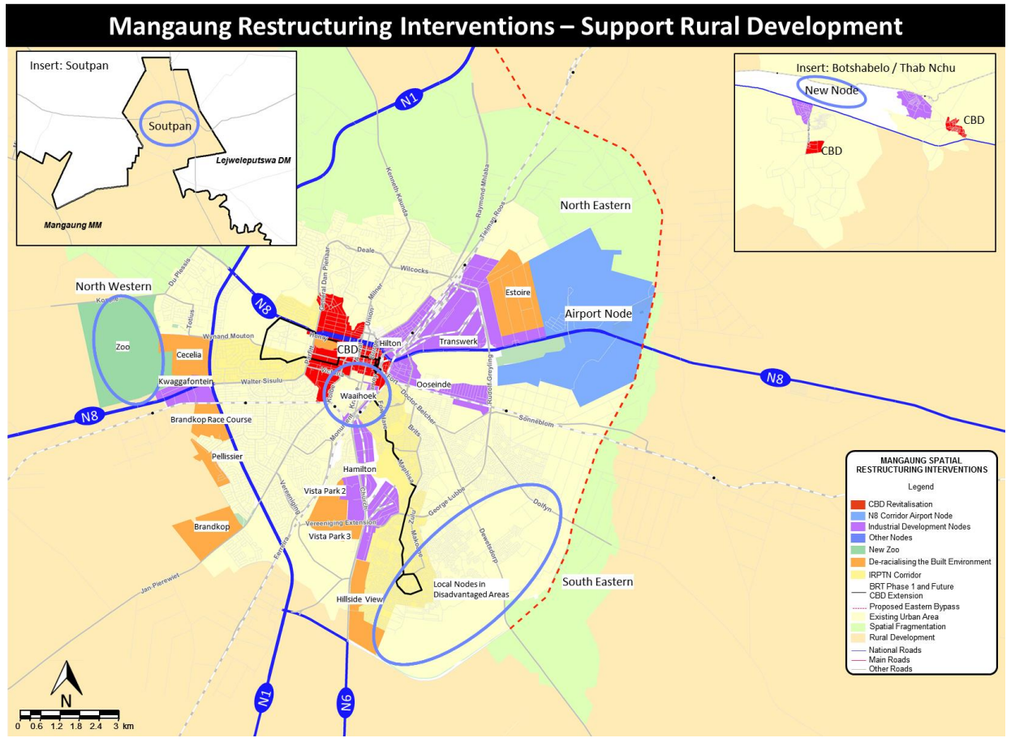


Figure B-2: Mangaung Restructuring Interventions – Support Rural Development

Diagram B-1: Diagram 4.2.3.1: Platinum Group Metals Mining Industry

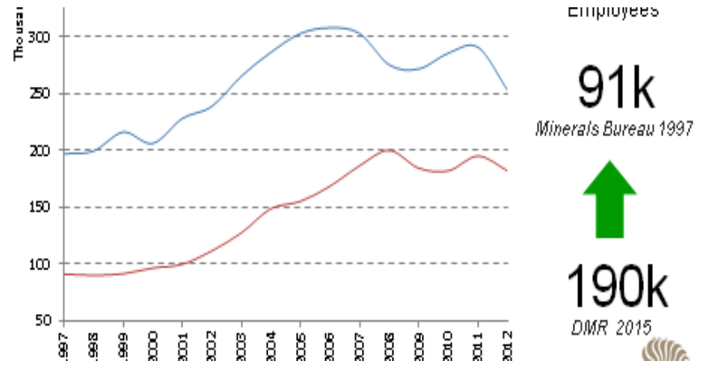
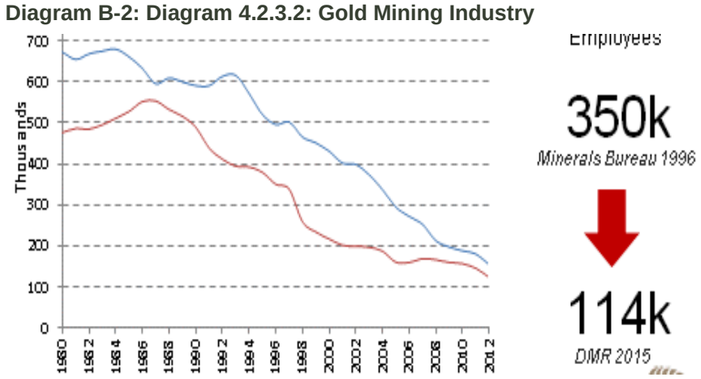
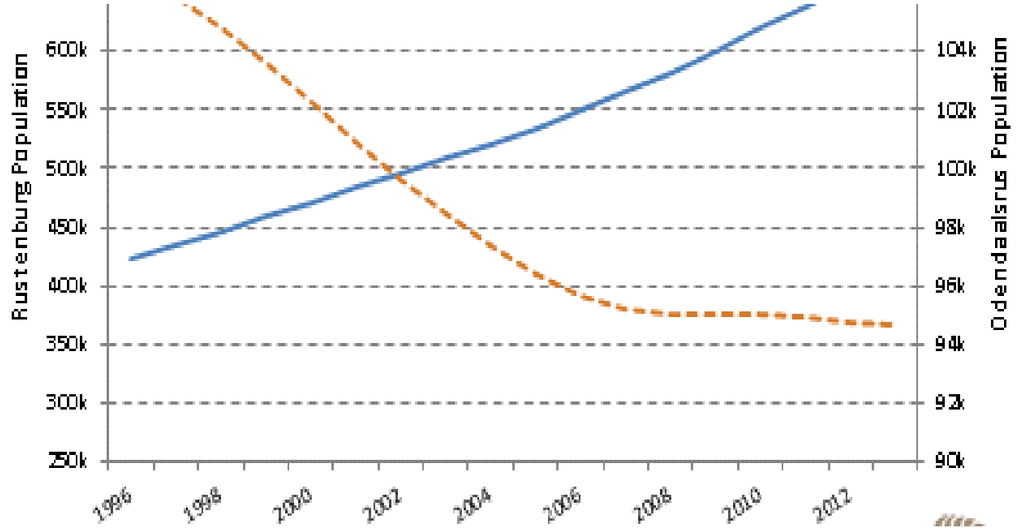


Diagram B-2: Diagram 4.2.3.2: Gold Mining Industry



So why is this important? It certainly tells a story about employment, but does it affect the population? Diagram B-3 below makes that point very clear. Odendaalsrus is a mining town in the Free State goldfields, and Rustenburg is next two a number of platinum mines. In general terms one can derive that a suffering economy does not attract people, it rather encourages people to leave. And a booming economy tends to attract people, with high levels of in-migration. This point illustrates the importance of an integrated economic approach, rather than producing and population projection in isolation from an economic forecast.

Diagram B-3: A Tale of Two Mining Towns



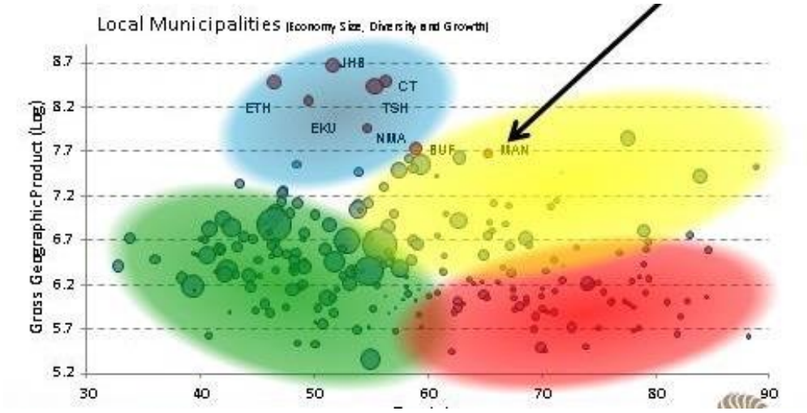
B.1.1 Mangaung Economy – Status Quo

What does the Mangaung Municipality look like? There are three important observations to make:

- **Size:** Mangaung is the smallest of the eight metropolitan municipalities in South Africa. There are other local municipalities which are bigger.
- **Diversity:** Metropolitan areas in general tend to be fairly diverse economies. But Mangaung is again the least diverse, or most concentrated metropolitan municipality in South Africa.
- **Growth:** Over the past decade, Mangaung did not see a lot of growth. In the bigger scheme of things, it actually declined in importance as measured by its contribution to the national economy.

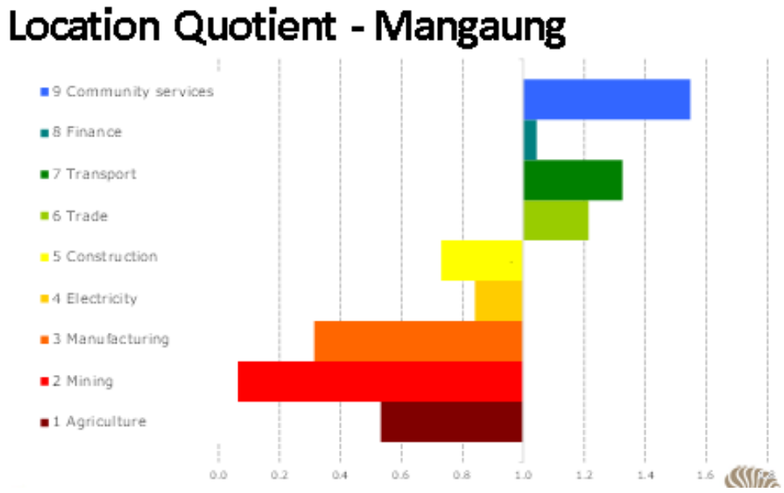
Diagram B-4 below highlights these three aspects for all the local municipalities in South Africa. The X-axis contains the level of diversity – from very diverse on the left, to very concentrated on the right. The Y-axis denotes the size of the economy (on a log scale), and the size of the bubble the historical growth as measured by the average annual growth between 2014 and a decade earlier.

Diagram B-4: Local Municipalities



Where the majority of the metropolitan municipalities are in the blue shaded area, Mangaung falls in the yellow shaded area which is your high-risk highly concentrated type economies. So, the next question that follows naturally is the question: what sectors make up the Mangaung municipality. Why is Mangaung such a concentrated economy?

Diagram B-5: Location Quotient – Mangaung



This question is best answered by looking at the Location Quotient (LQ) of the Mangaung municipality (Diagram B-5). The LQ-numbers illustrates the relative importance of an economic sector – compared to that of the national average. A number of one indicates that the regional share is very similar to the national share, and higher than one indicates that the economic sector is larger and more important in the local economy, compared to that of the national economy.

The Community services sector is more than 1.5x important, and this sector includes the Public Administration, Education and Health sub-sectors. A large portion of the Free State Provincial Government departments are based in Mangaung. With regards to Education, Mangaung has a larger number of boarding schools that attracts the school-going age kids from the surrounding rural areas, and also a university that attracts students.

B.1.2 Population Projections

IHS uses a cohort-component demographic model. The first step to project the population for a specific metropolitan municipality is to have the best available national projections. Projecting the provincial population in isolation, without having a proper understanding of the bigger population dynamics, can be dangerous.

Cohort-component demographic models draw heavily on population census data. In South Africa a population census is only conducted every 10 years. For the years in between, the models are calibrated by smaller surveys, and also administrative data (registered births and deaths). It is therefore possible to estimate population numbers using these inputs. IHS therefore also produced a couple of projections based on a cohort component demographic model. Please refer to **Error! R eference source not found.**, which contains a more detailed description of the population projections.

The following important demographic observations can be made – some for the bigger Free State, and some for Mangaung in particular.

- Historically the fertility rates in the Free State province were a bit lower than the national average, but this difference declined over the years. The same is true for the Mangaung metropolitan municipality, and will likely be the case for the future years.
- On a provincial level we see people migrating out of the Free State Province – similar to all the other rural provinces in South Africa. In the long run, this out-migration is assumed to slow down. We assume that over time this migration will slow down, from -10,000 in 2015 to negligible small numbers in 2037. In the peak of the gold mines closing down this was more than -20,000 each year.
- When it comes to migration affecting Mangaung, the patterns are slightly different compared to that of the Free State province. Mangaung in itself had a fairly stable population over the past two decades. The only significant migration that affects Mangaung, in an inward youth migration of people below the age of 25, those going to school and attending university. This is assumed to remain very similar in the future years, with the in-migration slowing down slightly into the future.
- HIV/AIDS is very much in line with the national averages – both in terms of timing, and severity.
- Life Expectancy with the resulting impact on mortality, is also in line with the national numbers, and is assumed to remain like that for the projection years.

For all scenarios we assume a starting population in 2015 of 833 000. The base scenario describes the highest probable population outcome, using the best estimates for the various demographic input variables (Table B-1). For the alternative population scenarios, the migration assumptions were tweaked to reflect a lower and a higher migration assumption.

Table B-1: Base Scenario Population

Variable	National	Free State	Mangaung (incl Naledi)	Share of FS
Total population ('000 000)				
2011	51.58	2.79	0.785	28.2%
2015	54.95	2.86	0.833	29.1%
Avg annual growth (11-15)	1.6%	0.6%	1.5%	
2025	62.52	3.06	0.943	30.8%
Avg annual growth (15-25)	1.3%	0.7%	1.2%	
2036	69.68	3.29	1.045	31.8%
Avg annual growth (25-36)	1.0%	0.7%	0.9%	

The base scenario assumes a slowing youth-aged in-migration into Mangaung. The low-scenario assumes that the in-migration into Mangaung will slow even quicker, reaching zero after a number of years, and then remain zero into future. The high scenario assumes that Mangaung will attract migrants, and then specifically working-age migrants looking for work - similar to that of the other metropolitan municipalities. The following table summarizes the different scenarios:

Table B-2Table 4.2.3.2: Summary of Scenarios

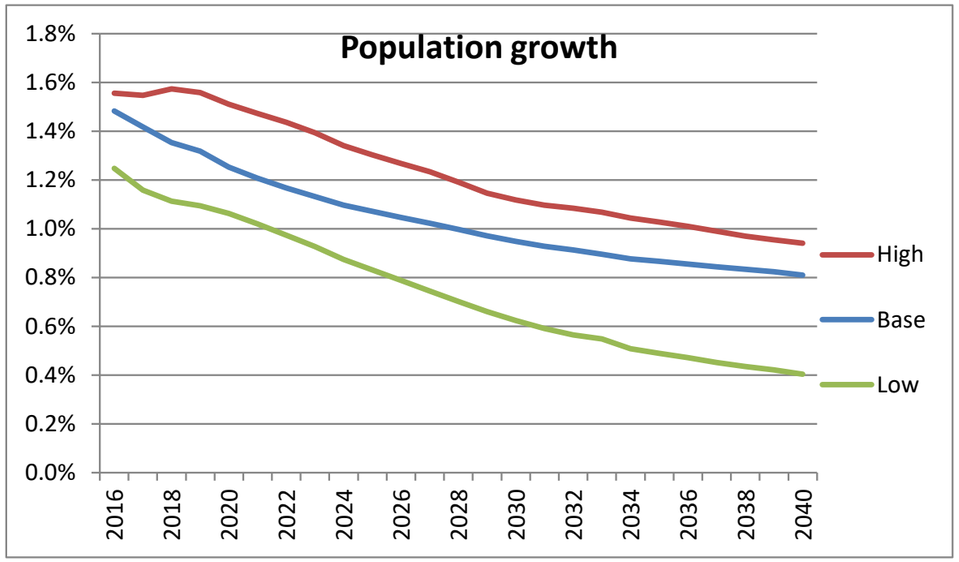
Scenario	Migration
Base	Slowing youth aged in-migration: 2015 – 2 900 pa 2025 – 2 200 pa 2036 – 1 700 pa
Low	Slowing even quicker, and reaching zero from 2020 onwards
High	Large parts of Mangaung experience similar levels of in-migration as Joburg. Migration is a more working-age type of migration

The resulting population numbers are shown in Table B-3 and Diagram B-6 below.

Table B-3: Resulting Population Numbers

	2011	Growth p.a.	2015	Growth p.a.	2025	Growth p.a.	2036
Low			833,138	1.0%	923,024	0.6%	986,688
Base	784,687	1.5%	833,138	1.2%	943,280	0.9%	1,045,301
High			833,138	1.5%	963,929	1.1%	1,089,138

Diagram B-6: Population Growth per Scenario, 2016-2040



As described above, the recommended population projection is the base scenario, as this scenario carries the highest probable outcome.

B.1.3 Economic Growth Scenarios

It is just as difficult to do economic growth forecasts as it is to do the population projections. What makes the economic forecasts even worse is the fact that we are exposed to the global economy far more compared to the population projections. Almost nobody has anticipated the global recession from the past couple of years. The fact is: the economic outlook changes almost on a daily basis and is substantially more volatile than the movement of people. One can ask the question of whether we do need economic projections at all for longer-term planning, when they are not stable at all. The answer lies in the *long*-term projections. Although the short-term outlook changes quickly, the longer-term growth outlook is substantially more stable, and this is what is important from a longer-term planning perspective. For the purpose of the study three scenarios were defined and the assumptions per scenario are presented below and the result per scenario for the 20-year planning horizon is presented in Diagram B-7 below describes the economic growth forecasts.

Base Case assumptions are:

- Status Quo – more of the same
- National Development Plan stays in place
- No downgrade of national economy
- Inflation targeting regime; between 3-6%
- Inflexible labour market; Unionised economy
- Unemployment remains high
- Global: South Africa marginally below world growth
- Currency depreciates long term
- Financial market remains stable

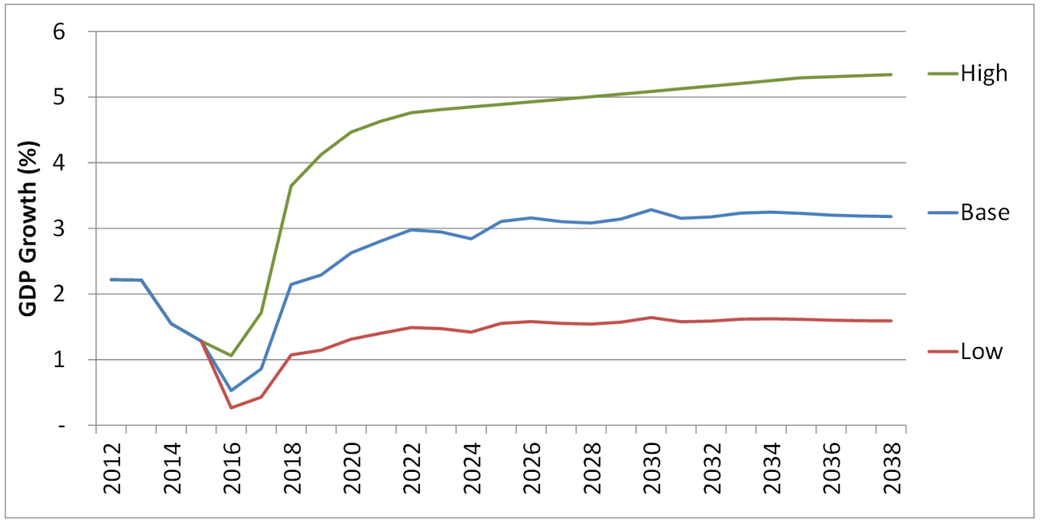
High growth scenario assumptions are:

- South Africa reaches its potential GDP of 4.5% in the short term; slightly higher in the longer term
- Labour Market more dynamic
- Education - quality increases
- Massive Public Sector investments (NDP)
- State owned Enterprises become profitable and competitive
- South Africa attract lots of external capital
- Labour productivity increases
- Increase Spending through employment
- Investment based growth; export oriented
- US, Europe & China growth remains strong
- Regional integration in Sub-Saharan Africa

Low growth scenario assumptions are:

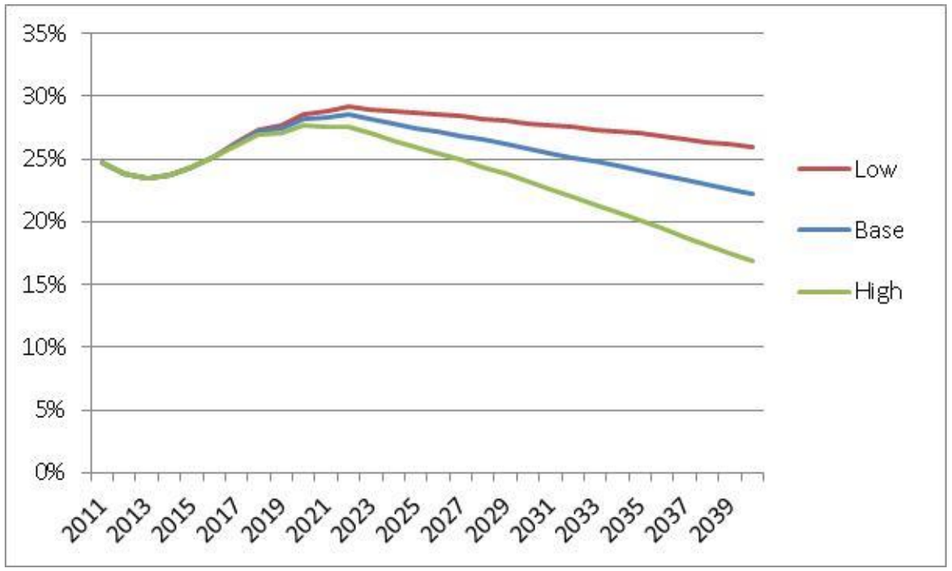
- Politics drags investor and consumer confidence
- Capital outflows; No investments
- South Africa is down-graded
- More Labour strikes
- Social pressure due to unemployment
- Interest rates balloons - Rand very vulnerable
- World growth doesn't help
- No money to implement NDP
- Government budgets constrained
- Lots of corruption due to social pressure
- No progress in regional integration
- Land redistribution hampers agriculture

Diagram B-7: Economic Growth Forecasts, 2012-2038



The IHS economic growth forecasts provides a balanced view of what we can expect in future, and considers all economic factors listed in **Error! Reference source not found.** (South African Economic Outlook). Important to note is that any economy does have its business cycles, and unavoidably there will be periods of upswings and periods of slower growth or even recession. The long-term economic projections provide the average annual economic growth across the entire planning horizon.

Diagram B-8: Unemployment Rate



The economic projections include the impacts on a number of other derived variables, such as employment and unemployment. Diagram B-8 illustrates the impact on the unemployment rate for different scenarios. The diagram above shows the 9% difference in the unemployment rate between the high growth scenario of roughly 17% by 2040, compared to a low growth scenario of 26% in 2040. The derived variables are as follows and presented in Table B-4.

Table B-4: Resulting in Formal Workers

	2011	Growth p.a.	2015	Growth p.a.	2025	Growth p.a.	2036

Low			221,022	0.1%	222,459	0.8%	243,555
Base	206,906	1.7%	221,022	0.4%	229,080	1.3%	262,914
High			221,022	0.7%	237,653	1.8%	288,985

B.2 Demographic and Socio-Economic Input for Modelling Purposes

B.2.1 Background

This section of the report deals with the delineation of the traffic and reporting zones, as well as the methodology and sources of information used in creating the land use model. The purpose of the land use model is to translate the Spatial Transformation/ Restructuring Strategy (Section **Error! R eference source not found.**) into households, population and workers. The allocation was done per traffic zone which served as input into the transportation modelling process.

B.2.2 Zoning Systems

The zoning system comprises 225 traffic zones, which were aggregated into 16 reporting zones for ease of presentation purposes.

The criteria used in the delineation process were:

- Freeways, major routes and railway lines.
- Natural barriers such as rivers and ridges.
- Census 2011 Sub Place Boundaries.
- Existing and future land use.
- SDF proposals.

The modelling study area and associated traffic zones are depicted in Figure B-3 and the reporting zones in Phase 1 (priority short term focus area) is illustrated on Figure B-5.

B.2.3 Base Year (2015) and Design Years (2025, 2036)

The base year of the land use model is 2015. Design years decided upon were medium term (2025) and long term (2036). The base year, as well as future year control totals pertaining to households, population, economically active population and workers were provided by IHS Information and Insight. Six scenarios were developed:

- Population growth: Low, Middle, High.
- Economic growth: Low, Middle, High.

The middle scenario (both population and economic growth) was perceived to be the most appropriate/ realistic to use in the land use model (see par. **Error! Reference source not found.**).

B.2.4 Deliverables by Traffic Zone

The following deliverables were provided per traffic zone (base year and design years) (Examples of database attached as **Error! Reference source not found.**):

- Dwelling Units (low, middle, high income).
- Population (low, middle, high income).
- Economically Active Population (formal, informal and unemployed) = productions.
- Floor Area (m²): retail and office.
- Formal Workers by type e.g. retail, office, industrial, commercial, local serving, agricultural and mining, construction transport and domestic workers = attractions.
- Informal Workers.
- Unemployed People.

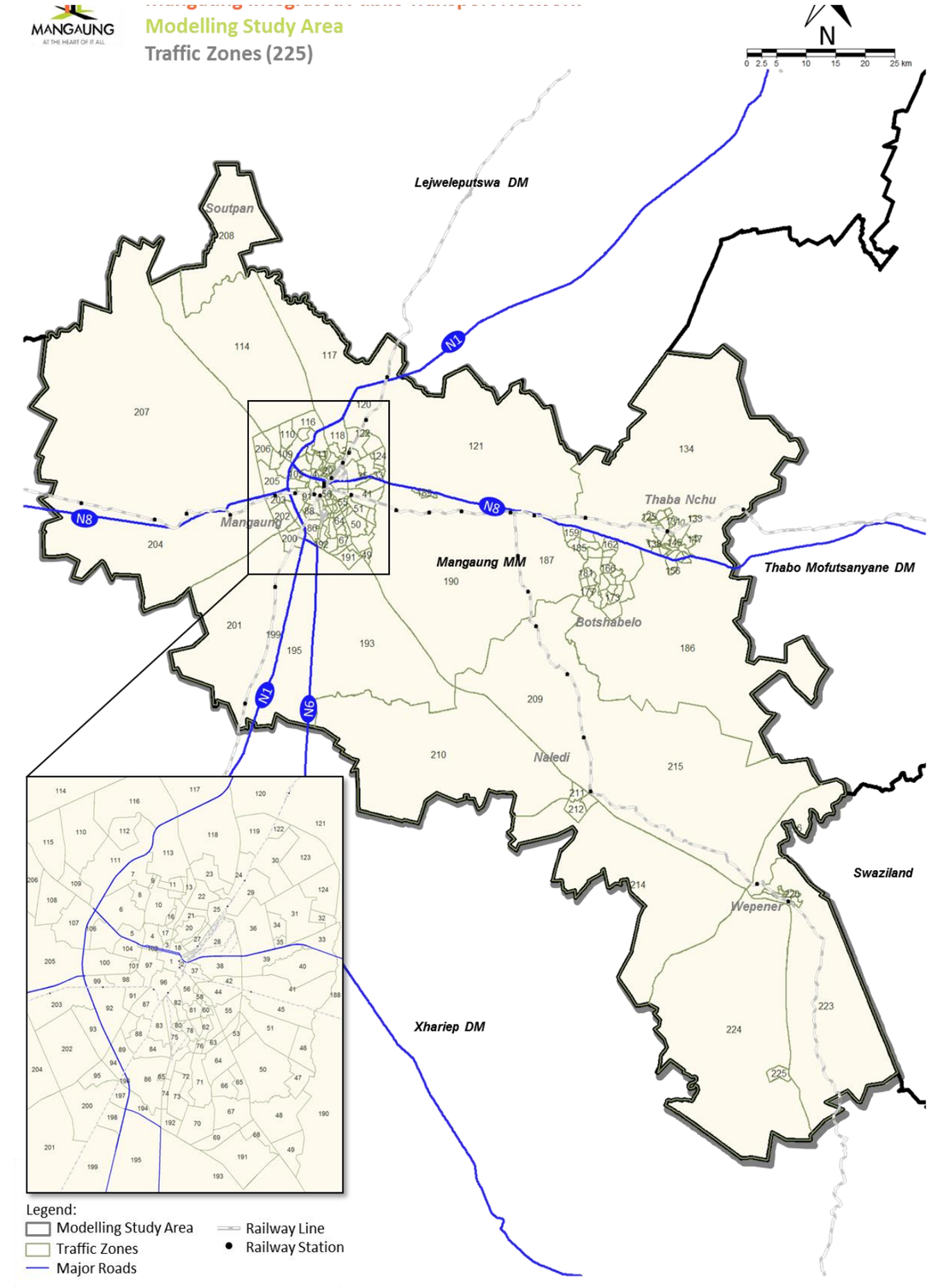


Figure B-3: Modelling Study Area - Traffic Zones

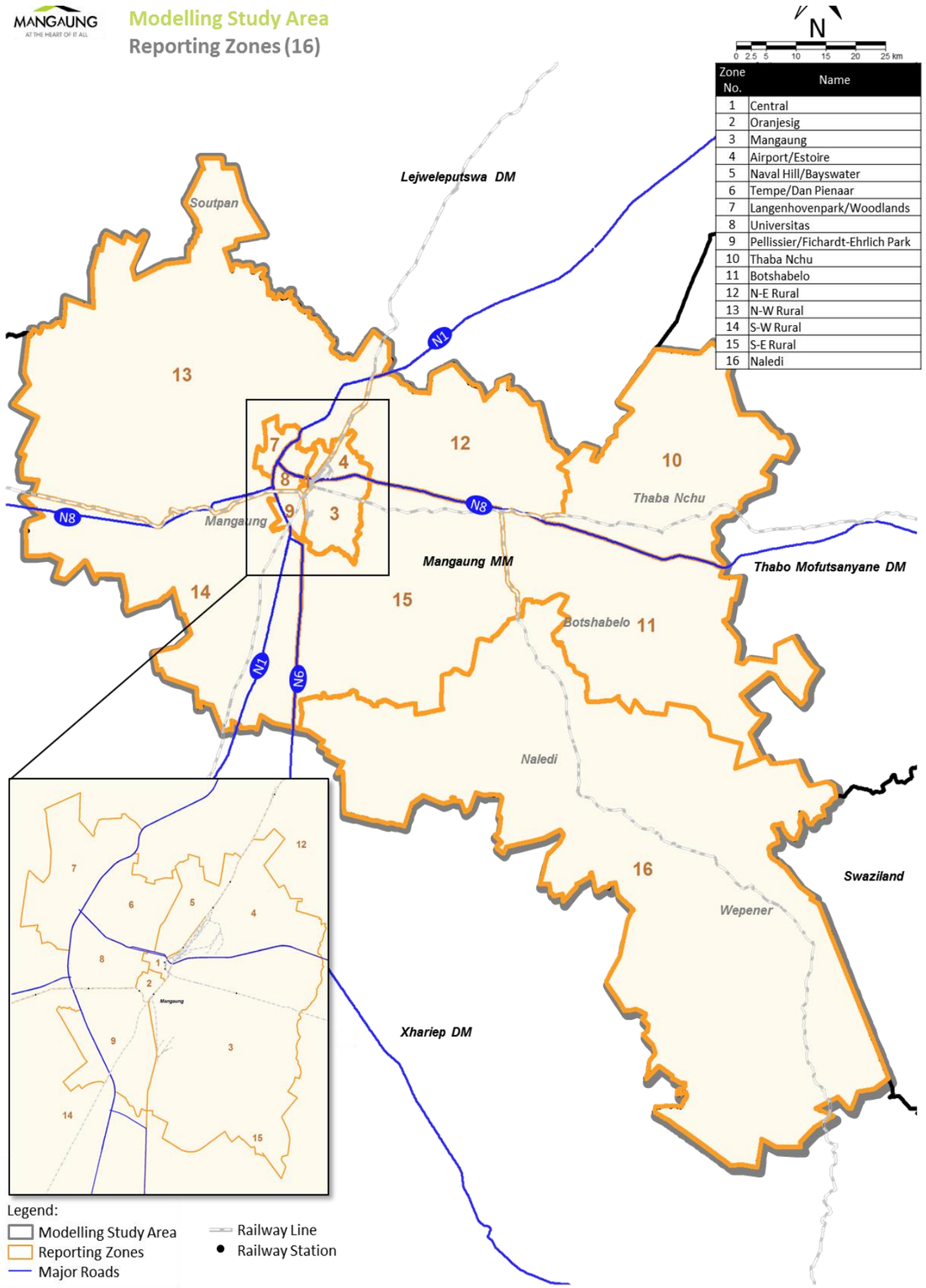


Figure B-4: Modelling Study Area - Reporting Zones

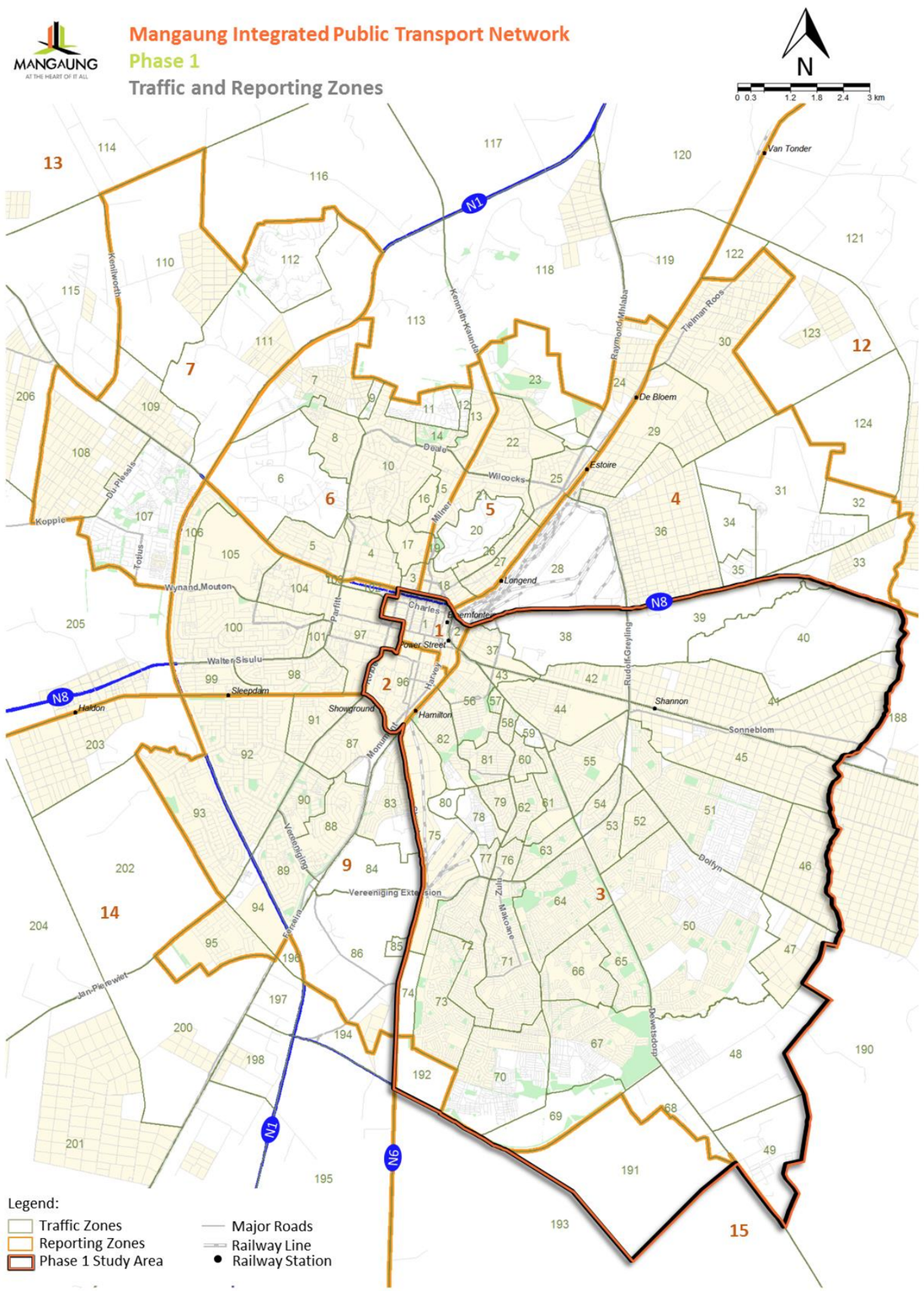


Figure B-5: Phase 1 - Traffic and Reporting Zones

B.2.5 Methodology and Sources of Information (Base Year 2015 and Design Years 2025, 2036)

B.2.5.1 Base Year 2015

- Productions (households, population and economically active population):
  - Census 2011 was used as point of departure to determine the following per traffic zone:
  - Number of households per income group:
    - *Low Income: R0 – R3183 per month.*
    - *Middle Income: R3184 – R12 817 per month.*
    - *High Income: R12 817+ per month.*
  - Number of persons per income group.
  - Number of economically active population (formal, informal and unemployed) per traffic zone.
  - The 2011 number of households, population and economically active population were updated to the 2015 Control Totals. Aerial photography (2011 and 2015) were scrutinised for land use changes. Changes in dwelling unit growth assisted in the distribution of the increment (2011-2015) per traffic zone.
- Attractions (Formal Workers) per Traffic Zone

The 2015 Formal Worker Control Totals (per type) were used as point of departure. The methodology used in the distribution by traffic zone is discussed below.

- Retail and Office Floor Area and Workers:
  - *The retail floor area per traffic zone was calculated by using sources such as the Southern African Shopping Centre Directory 2015, Map Studio Maps as well as measurements from the 2015 aerial photography. By applying an appropriate floor area ratio, the number of retail workers was calculated per traffic zone.*
  - *Office uses were identified from aerial photography. The number of floors was counted, and the floor areas were measured. By applying an appropriate floor area ratio, the number of office workers was calculated.*
- Industrial/ Commercial Workers:
  - *Occupied industrial site areas were identified from aerial photography and by applying an appropriate floor area ratio; the number of workers were calculated.*
- Local Serving Workers:
  - *The sources of information for Local Serving Workers were the Map Studio Maps as well as the Department of Education's database on learners and educators. The Map Studio symbols were categorised into services such as medical-, tourism-, and other government related services such as libraries, police stations, post offices and sports facilities. An appropriate worker ratio per type was applied to estimate the local serving workers per service.*
- Agricultural and Mining Workers
  - *After inspection of aerial photography, areas with agricultural and mining activities were identified. The number of agricultural and mining workers derived from the 2015 Control Totals was distributed between these areas.*
- Transport Workers
  - *The allocation of transport workers is a function of the number of dwelling units and formal employment per traffic zone.*
- Construction Workers
  - *The allocation of construction workers is a function of dwelling unit growth as well as employment growth per traffic zone.*
- Domestic Workers
  - *The allocation of domestic workers is a function of the number of middle- and high-income households.*
- Informal and Unemployed
  - *The informal and unemployed workers were calculated by traffic zone. A larger percentage of informal and unemployed people were located at place of residence than at place of work.*

Table B-5 provides a detailed description of the Methodology and Sources of Information used in compiling the base year.

Table B-5: Land Use Data: Methodology and Sources, Base Year 2015

		Item	Methodology	Source of Information
PRODUCTIONS	1	Dwelling Units (per income group)	Conversion Table between Census 2011 and TTz's, thereafter updated to 2015 per TTz	Census 2011 IHS Control Total 2015, Aerial Photography 2011/ 2015
	2	Household size	Conversion Table between Census and TTz, thereafter updated to 2015 per TTz	Census 2011
	3	Population	Conversion Table between Census and TTz, thereafter updated to 2015 per TTz	Census 2011 IHS Control Total 2015
	4	Economically Active Population (EAP)	Conversion Table between Census and TTz, thereafter updated to 2015 per TTz	Census 2011 IHS Control Total 2015
	5	Formal EAP	Conversion Table between Census and TTz, thereafter updated to 2015 per TTz	Census 2011 IHS Control Total 2015
	6	Informal EAP	Conversion Table between Census and TTz, thereafter updated to 2015 per TTz	Census 2011 IHS Control Total 2015
	7	Unemployed EAP	Conversion Table between Census and TTz, thereafter updated to 2015 per TTz	Census 2011 IHS Control Total 2015
ATTRACTIONS	8	Retail Floor Area per Traffic Zone	Use sources of information as well as measurements from aerial photography and land use surveys	SA Shopping Centre Directory, 2015, Map Studio, Aerial Photography 2015
	9	Office Floor Area per Traffic Zone	Measurements from aerial photography and land use surveys	Aerial Photography 2015
	10	Retail Workers per Traffic Zone	Calculate workers by applying floor area ratio	IHS Economic Model Control Total 2015 Aerial Photography 2015
	11	Office Workers per Traffic Zone	Calculate workers by applying floor area ratio	IHS Economic Model Control Total 2015 Aerial Photography 2015
	12	Industrial Workers per Traffic Zone	Measure site area from aerial photography 2015 Calculate workers by applying floor area ratio	IHS Economic Model Control Total 2015 Aerial Photography 2015
	13	Commercial Workers per Traffic Zone	Measure site area from aerial photography 2015 Calculate workers by applying floor area ratio	IHS Economic Model Control Total 2015 Aerial Photography 2015
	14	Local Serving Workers per Traffic Zone	Apply Local Service Ratio to calculate workers	IHS Economic Model Control Total 2015 Map Studio, Dept. of Education
	15	Agriculture and Mining Workers per Traffic Zone	Allocation per Traffic Zone – use aerial photography for allocation purposes	IHS Economic Model Control Total 2015 Aerial Photography 2015
	16	Transport Workers per Traffic Zone	Allocation is a function of number of dwelling units and formal employment per Traffic Zone	IHS Economic Model Control Total 2015
	17	Construction Workers	Function of dwelling unit growth and formal worker growth per Traffic Zone	IHS Economic Model Control Total 2015 Aerial Photography 2011/2015
	18	Domestic Workers	Function of high and middle income households	IHS Economic Model Control Total 2015
	19	Informal Workers • at home • at work	Larger percentage informally employed at place of residence than at place of work	IHS Economic Model Control Total 2015
	20	Unemployed People • at home • at work	Larger percentage unemployed at place of residence than at place of work	IHS Economic Model Control Total 2015

B.2.5.2

B.2.5.3 Design Years 2015, 2036

Table B-6 shows the existing and expected number of dwelling units, population and formal workers for the Mangaung MM. It is evident that the expected growth will be in the order of 113 200 dwelling units, 212 160 people and 41 900 formal job opportunities.

Table B-6: Preferred Scenario: Dwelling Units, Population, Formal Workers, 2015-2036

Base Scenario: Dwelling Units, Population, Formal Workers

Variable	Current	Future		Increment		Total Increment
	2015	2025	2036	2015-2025	2025-2036	
Dwelling Units	261,155	323,437	374,364	62,282	50,927	113 209
Population	833,138	943,280	1,045,301	110,142	102,020	212,162
Formal Workers	221,022	229,080	262,914	8,058	33,834	41,892

Source: IHS Information & Insight

The allocation of future growth (dwelling units, population, and job opportunities) were done according to the Mangaung Spatial Transformation agenda as contained in the Mangaung SDF and Built Environment Plan (see par **Error! Reference source not found.**).

The Mangaung Integrated Development Plan 2016/17 identified the following key focus areas/ objectives towards achieving a balanced city structure:

- Promote Economic Development

  This objective was achieved by firstly focusing on redevelopment in the CBD's of Bloemfontein, Thaba Nchu and Botshabelo, as well as increasing the occupancy rate of vacant buildings. In other words, a proportion of the population and job opportunity growth were allocated to the abovementioned CBD's.

  Secondly the development potential of the N8 Corridor was calculated and incorporated in the model as part of a phased approach to develop the node.

  The next priorities were the industrial nodes of Transwerk, Hillton, Ooseinde, Hamilton, Thaba Nchu and Botshabelo. The point of departure was to assume that vacant buildings will be occupied again and that vacant serviced stands will be developed. The allocation of job opportunities were done accordingly.

  Similarly, economic development was strengthened in new business nodes such as Waaihoek, the New Zoo area, the new node between Botshabelo and Thaba Nchu, as well as local nodes in the Mangaung, Thaba Nchu and Botshabelo areas.

- Deracialising the Built Environment

  The main focus of this objective was to incorporate the seven land parcels (Cecilia, Pelissier Infill, Brandkop, Brandkop Race Course, Vista Park X2, 3, Hillside View and Estoire) in the modelling. The number of units, population and job opportunities which could be created by these developments, were calculated and incorporated in the model.

- Promote Intensification and Densification

  Apart from general densification in the existing urban footprint by way of subdivision and/ or redevelopment of land, infill development were also allocated to all vacant erven and vacant buildings along IPTN Phase 1.

- Prevent/ Curb Spatial Fragmentation

  The outward expansion of the urban fabric of Mangaung (light green on map) was limited to only a small percentage of the future growth.

- Support Rural Development

  Growth in agriculture, mining and tourism job opportunities as well as limited residential growth were allocated to the rural zones.

The methodology described above is further explained by Table B-7.

Table B-7: Land Use Data: Methodology and Sources, Projection 2025, 2036

		Item	Methodology	Source of Information
PRODUCTIONS	1	Dwelling Units	Increase dwelling units per traffic zone according to information received from the town planners as well as the Restructuring Objectives in Table 4.2.2.2	Policy Documents: IDP 2016/17, SDF, Human Settlement Plan, information (presentations and township layouts) received from the town planners
	2	Household size	Adjust household size per Traffic Zone	IHS Demographic Model
	3	Population per Income Group	Calculation	Household size, IHS Demographic Model
	4	Economically Active Population (EAP)	Adjust percentage Economically Active Population per Traffic Zone	IHS Demographic Model
	5	Formal EAP	Adjust percentage per Traffic Zone	IHS Demographic Model
	6	Informal EAP	Adjust percentage per Traffic Zone	IHS Demographic Model
	7	Unemployed EAP	Adjust percentage per Traffic Zone	IHS Demographic Model
ATTRACTIONS	8	Retail Floor Area per Traffic Zone	Function of population and number of sources of information per Traffic Zone	Information from the town planners such as applications, new township layouts, policy documents
	9	Office Floor Area per Traffic Zone	Function of retail and a number of sources of information per Traffic Zone	Information from the town planners such as applications, new township layouts, policy documents
	10	Retail Workers per Traffic Zone	Calculate workers by applying floor area ratio	
	11	Office Workers per Traffic Zone	Calculate workers by applying floor area ratio	
	12	Industrial Workers per Traffic Zone	Calculate workers by applying floor area ratio	Information from the town planners such as applications, new township layouts, policy documents
	13	Commercial Workers per Traffic Zone	Calculate workers by applying floor area ratio	Information from the town planners such as applications, new township layouts, policy documents
	14	Local Serving Workers per Traffic Zone	Function of population per Traffic Zone, apply ratio	IHS Economic Model - Control Total
	15	Agriculture and Mining Workers per Traffic Zone	Allocation based on base year and possible known interventions	IHS Economic Model - Control Total
	16	Transport Workers per Traffic Zone	Allocation is a function of number of dwelling units and formal employment per Traffic Zone	IHS Economic Model - Control Total
	17	Construction Workers per Traffic Zone	Function of dwelling unit growth and formal worker growth	IHS Economic Model - Control Total
	18	Informal Workers • at home • at work	Larger percentage informally employed at place of residence than at place of work	IHS Economic Model - Control Total
	20	Unemployed People • at home • at work	Larger percentage unemployed at place of residence than at place of work	IHS Economic Model - Control Total

C Annexure C: THE IHS DEMOGRAPHIC MODEL

IHS uses a cohort-component demographic model. The first step to project the population for a specific metropolitan municipality is to have the best available national projections. Projecting provincial population in isolation, without having a proper understanding of the bigger population dynamics, can be dangerous. The section below focuses on a top-down approach: setting and projecting the national population first, thereafter, refining the provincial projections, and lastly the metropolitan projections within the province.

C.1 Population

- National population projections are determined by five primary factors:
- Size of population in the base year, $\mathbf{P_t}$
- Number of deaths occurring between the base and projected years, $\mathbf{D_t}$
- Number of births occurring between the base and projected years, $\mathbf{B_t}$
- Immigrants arriving in the country between the base and projected years, $\mathbf{I_t}$
- Emigrants leaving the country during the base and projected years, $\mathbf{E_t}$

The above variables contribute to the projected population, Pt_{+1}, within the following demographic balancing identity:

$$P_{t+1} = P_t + B_t - D_t + I_t - E_t$$

The final population figures are based on a model that computes a separate balancing equation for each population group, gender group and province, adding the individual results to arrive at the total national population. This is because fertility, mortality and migration factors vary largely between the different groups. This methodology ensures accurate representation of the grouping breakdowns within the country, as well as an accurate representation of the national population.

IHS used an external demographic model for the final population output, using internal models and basic assumptions to determine, amongst others, the following variables; the base year population, total fertility rates, age-specific fertility rates, sex ratios at birth, life expectancies and international migration. The following steps were taken for each population group.

C.2 Determining the Base Population

From the demographic balancing equation, the accuracy of P_0 (base year) determines the accuracy of population progressions made for all P_t. Furthermore, the age structure at time t = 0 plays an important role in determining all age structures for P_t. The progression is further complicated in that age structure by gender distribution (throughout the world) is generally unreliable and that the data for the base year, P_0, is best evaluated, as opposed to simply measured.

IHS therefore estimated a national starting population for 1970, the year in which the South Africa's most accurate census was taken. This starting population estimate was based on Census data at the time, as well as on backward extrapolation using later census data. It was further broken into population group and gender groups, with a special focus on keeping the age, gender and population group distributions in line with accepted empirical and theoretical norms. Further adjustments were made to account for the Transkei, Bophuthatswana, Venda and Ciskei (TBVC countries) population data, and assumptions regarding fertility and mortality rates at the time.

When backward extrapolating from more recent censuses, IHS used the most recent revised census estimates for each of the censuses. The total 1970 base population figure was concluded by adding the figures from the different population and gender groups.

Once the national base population had been estimated, the same exercise was carried out for each province in order to arrive at the base population for each province. Naturally, these were calibrated in order to sum to the national population estimate, with special care being taken to ensure that each provincial age and gender distribution matched theoretical and empirical norms.

Determining Fertility Rates

The Total Fertility Rate (TFR) is the rate for a single average woman over the entire span of possible birth years (in other words, the fertility rate between the ages of 15 and 50 added together) and is therefore defined as follows:

$$TFR = \sum_{x=15}^{49} ASF_x$$

$$\text{where } ASFx = \frac{\text{Births in year t to women aged x last birthday at time of birth}}{\text{mid year population of women aged x last birthday}}$$

TF rates were determined per population group to account for the large difference between each group. The national TFR's were adjusted during the calibration of the of the national model such that the population estimate started at the given population in 1970 and passed through each of the population figures from the 1985 census up until the 2011 population Census, within an adjustment factor that recognised the quality of each individual survey.

Nonetheless, there is broad consensus regarding fertility rates for the Asian population. Sadie (1993) projected the fertility rates for this population to be at 1.8 for the period 2006 to 2011 whereas Calitz (1996) projected 1.81 for 2015 to 2020. IHS compared the above TFR and adjustments described above, to a number of sources, including the StatsSA 1996 census, various StatsSA midyear estimates reports, the ASSA 2002, 2003 and 2008 models, as well as BMR reports to arrive at a final adjusted TFR progression for the Asian population as depicted in this section.

There are bigger differences regarding the TFR progression for the African population. However, demographers do tend to agree that a decline in TFR is expected to continue for this population group over the next few years. This is supported by Sadie (1993) and Caldwell and Caldwell (1993). The factors driving the decline in TF rates for this population group are; urbanisation, a greater use of contraceptives, lower fertility preferences among Africans and growing labour force participation rates among women. It is further expected that greater urbanisation will lead to lower fertility rates in this population group, as supported by SADHS (1999) which showed that fertility rates among the urban African population were 40% lower than the average. Again, IHS compared these assumptions to a number of sources to arrive at a final adjusted TFR progression for the African population as depicted below.

The Coloured population group is expected to experience a similar decrease in TFR as the African population group, although less severe, for similar reasons. Using the same methodology described above, IHS arrived at a final adjusted TFR progression for the Coloured population group.

There is also general consensus in the literature regarding TFR of the White population group; specifically that it will remain stable over the period 1996 up to 2020. Sadie (1993) indicates that the White population group will experience a decline of TFR to about 1.66 by 2001 whereas Calitz (1996) indicated a progression from 1.7 to 1.5 from 2000 to 2020. IHS used the above studies, as well as Van Aardt and Van Tonder (1999) and various StatsSA datasets, the various ASSA models and BMR reports to arrive at a final adjusted TFR progression.

To calculate Total Fertility Rates (TFR) per province, IHS looked at the number of babies born over the period in each province. This data was collected from various sources, including the StatsSA censuses. This is done because, even within the same population group, some provinces have recorded higher fertility rates than other provinces. For example, the African population group in the Eastern Cape has more children compared to the same population group living in the Western Cape.

This variable was benchmarked to fit the total number of babies born for the period 1991 to 2011. It should also be noted that the 0-4 age category is often underreported during population censuses, and therefore this figure was adjusted slightly upwards to correspond with the national TFR rates. Finally, provincial TFR's were adjusted for accuracy in order to calibrate the provincial models to the total national model for each population group.

National Total Fertility Rates (TFRs) 2015 – 2036

	African	Whites	Coloured	Asian
2015	2.68	1.70	2.39	1.77
2025	2.31	1.73	2.30	1.89
2036	2.16	1.77	2.25	1.99

C.3 Birth Ratios

Birth (or sex) ratios measure the number of males in the population per the number of females in the population. Population growth depends largely on the number of females, and this input will therefore determine the overall growth rate of the population. As with TFR's, the birth ratios differ from one population group to another, and from one province to another. However, these rates are typically dependant largely on genetics and are therefore very stable over time for a given population group and geographic area.

C.4 Life Expectancy

Determining average life expectancy is complicated by a number of factors. Firstly, life expectancy varies across different genders, population groups, age groups and geographic area. Furthermore, the effect of HIV and AIDS on the mortality rates across the various population groups is likely to complicate the estimation. Therefore, IHS ignored the effect of HIV and AIDS on mortality rates when calculating initial life expectancies, and opted to use a separate module to calculate the effect of the reduced life expectancies due to HIV and AIDS.

Estimating life expectancy for the African population group is slightly more complex than the other population groups – for which there is broadly consensus amongst demographers. There is currently little consensus on long term changes in this population group's life expectancy. Whereas better healthcare and more urbanisation are likely to lead to increased life expectancy for those over the age of 55, the impact of HIV and AIDS are expected to dramatically decrease the life expectancy of those between the ages of 15 to 55. Again, IHS ignored the impact of HIV and AIDS on mortality rates, using a separate module for the analysis of this impact. IHS applied a simple backward extrapolation technique to the life expectancy for the African population group from 1970 to 1981. Most data sources appear to underestimate the life expectancy for his group prior to 1970. Simple forward extrapolation was then applied for the group from 1981 up to 1995, with adjustment factors applied to bring the growth in this population group to the national estimate, and to other data sources, specifically the StatsSA mid-year estimates and BMR 272 and BMR 330 surveys.

The above life expectancies are used as a starting point for the IHS model, but are adjusted in order to balance the national model to other existing data sources. When estimating the population per province, those life expectancies are further adjusted to balance the sum of the provincial population estimates to the existing national model.

Final (Output) Life Expectancies, 2015-2036 (Includes the impact of HIV/AIDS)

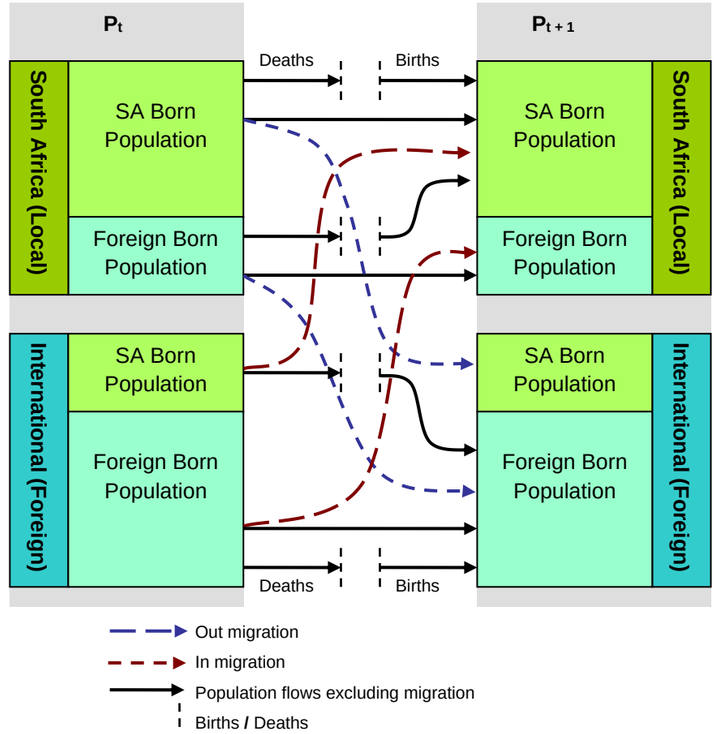
	African	White	Coloured	Asian	African	White	Coloured	Asian
	Male				Female			
2015	56.9	72.0	62.9	68.1	63.6	79.6	68.1	75.7
2025	62.3	74.5	66.6	71.2	69.1	82.1	71.7	79.5
2036	66.0	76.5	69.9	74.5	72.2	84.4	74.7	82.5

C.5 Migration

Two types of migration exist, domestic (for example intra provincial) migration and international migration, both of which affect either the population within a province, and / or the total national population. However, obtaining a net migration figure (even on a national level) is complicated by a number of factors and has proven elusive in the past. IHS therefore developed a specific South African migration model in order to measure the effects of international in and out migration on South Africa, and used the data from Census 1996, Census 2001, Census 2011 and CS 2007 to measure intra provincial migration. The international migration model was defined by starting with the basic population balancing equation;

$$P_{t+1} = P + B_t - D_t + I_t - E_t$$

For the purpose of better understanding migration, this formula was expanded, with the following image used as an illustration for the process that was followed.



The balancing equation is thus expanded as follows:

$$P_{t+1} = P_t + B_t - D_t + (I^F_t + I^L_t) - (E^F_t + E^L_t)$$

Where:

The standard variables retain their meaning, with the additional variables representing the following;

- $\mathbf{I^F_t}$ = In migration of foreign born population
- $\mathbf{I^L_t}$ = In migration of local born population
- $\mathbf{E^F_t}$ = Out migration of foreign born population
- $\mathbf{E^L_t}$ = Out migration of local born population

Furthermore and also demonstrated using the above image, the following equation is defined:

$$P^F_{t+1} = P^F_t - D_t + I^F_t - E^F_t$$

Where:

The standard variables retain their meaning

- $\mathbf{P^F_t}$ = Foreign born population living in South Africa

By measuring P^F_t and P^F_{t+1} IHS was able to derive a net migration figure for the foreign born population of South Africa. This was achieved by measuring the change in size of the foreign born population between Census 1996, Census 2001 and CS 2007.

However, these figures were also compared to refugee statistics from the UNHCR, and the foreign born population as measured by the UN. Final balancing figures were obtained by measuring out migration from the foreign perspective where it was available.

Net migration of the local population ($I^L_t - E^L_t$) was measured largely from the foreign perspective. Anecdotal evidence suggested that most South African out migrants move to the following five countries; England, Australia, New Zealand, America and Canada. IHS measured immigration of South Africans ***to*** the major five destinations, balancing for variables such as the change in the South African born population overseas, long term work permits issued, citizenships issued and number of

arrivals declaring their intention to migrate. The accuracy of these figures was confirmed by the proximity of these various figures even when using the different measures to arrive at a net migration figure for South Africans.

A final adjustment was made for the remaining countries of the world, with adjustment factors confirmed by other foreign perspective data where available. Age, gender and population group data was also captured using the foreign perspective approach for countries that captured such data for arriving migrants.

Regarding intra-national migration, IHS used the 1996, 2001, 2011 StatsSA census surveys and the Community Survey 2007 to measure inter-provincial migration. Average annual migration figures are used to determine migration rates using the IHS provincial demographic model. Net migration was measured for each gender and population group and for each province.

C.6 Adjusting for HIV

HIV and AIDS will clearly have a large impact on the growth of a given population. However, there are many factors that affect the impact that the virus will have on population progression, namely; adult HIV prevalence rates, speed at which the virus progresses, age distribution of the virus, mother to child transmission and child treatment, adult treatment and finally the percentage by which having the virus will decrease total fertility. IHS developed a number of assumptions for each of the above variables, specifically the following:

The **Adult HIV prevalence rates** were obtained from the HIV/AIDS model built by the Actuarial Society of Southern Africa (ASSA-2008). These rates were used as base rates on a provincial level. However, IHS slightly adjusted the provincial ASSA-2008 data to more accurately reflect the national HIV Prevalence rate per population group as used in the national demographic models. The ASSA model in its turn uses the prevalence rates from various primary data sets – in particular the HIV/AIDS surveys conducted by the Department of Health and the Ante-Natal clinic surveys. Their rates are further adjusted for over-reporting and are smoothed using EPP.

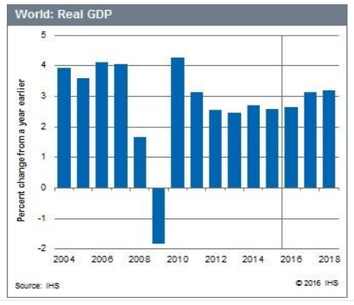
The **age distribution of the virus** was obtained from the StatsSA mid-year estimates, with no adjustments. These figures were checked against the default spectrum estimates and were generally comparable. The StatsSA figures has a slightly higher bias toward a higher risk for ages 20 – 24, which fits the South African assumption better.

Finally, the **stage of the HIV/AIDS virus** differs from province to province, e.g. KwaZulu-Natal is at a much more advanced stage of the disease and on a higher level than the Western Cape. IHS adjusts each province for this difference by using the ratio of the difference between the national and provincial level in the ASSA 2008 model and applying that ratio to the IHS national estimates.

D ANNEXURE D: IHS GLOBAL ECONOMIC OUTLOOK – Q1 2016

D.1 Highlights

- The world economy ended 2015 at a weak pace, with quarterly GDP growth coming in at a subpar pace of only 2% in the fourth quarter, according to the IHS preliminary estimate. (Unless otherwise stated, all quarterly GDP growth rates reported here are based on real seasonally adjusted annualized rates, or SAAR).
- Based on that figure, average annual GDP growth for full-year 2015 would be 2.6%—well below the global economy's sustainable long-term potential growth rate, which we estimate to be 2.9%. For the past five years, the focus of much attention has been the progressive weakening of emerging-market economies, where GDP growth has cumulatively receded 3.5 percentage points, from a post-Great Recession peak of 7.3% in 2011 to 3.8% in 2015.



- Emerging-market economies decelerated once again in 2015, with their GDP growth retreating 0.6 percentage point, dropping from 4.4% in 2014 to 3.8% in 2015. Such a relentless decline in economic activity reflects major structural problems, as well as various cyclical headwinds.
- Meanwhile, the advanced economies' performance has also been disappointing. To be sure, their combined GDP growth had rebound by 0.7 percentage point the previous year, from 1.1% in 2013 to 1.8% in 2014. It seems to have run out of steam in 2015, though—it only edged up 0.1 percentage point, registering just 1.9% growth.
- By any standard, the advanced economies' growth of less than 2% is rather mediocre and certainly not sufficient for improving their labor markets and income levels, especially given the unfavourable demographic trends of these countries.
- Among developing countries, the worst off for the foreseeable future will be energy and primary commodity exporters; some are already in outright recession, and many more are headed that way. China and other major Asian manufacturing exporters are struggling as well. A variety of structural and cyclical headwinds are lowering their return on capital and business profitability, hurting their exports and investments and triggering capital flight and currency volatility.
- Among advanced economies, the major Anglo-Saxon economies—the United States, United Kingdom, Canada, Australia, and New Zealand—have generally been the better performers , while Japan and Eurozone have been the laggards. A number of Europe's non-Eurozone economies, such as Sweden, are doing better.
- While most economies are performing significantly below potential, within major economies, the household sectors have held up well so far, thanks to very low inflation and interest rates as well as a major consumer disposable income windfall from lower energy prices since 2014.
- Recent trends suggest growth during the first half of 2016 will be substandard, but the latest IHS forecast envisages a rebound during the second half of the year. The recovery will be fuelled by central banks' monetary support, the lagged effect of low energy and raw material prices, and a rebound in the global inventory cycle.
- The downside risks remain high, however, since continuing weakness in global industrial activity, business investment, and exports could undermine household spending and trigger a downturn in the services sector.

Global growth ended 2015 with a whimper and is set for another subpar performance during first-quarter 2016. IHS estimates that the world economy decelerated sharply during the final two quarters of 2015, with its quarterly GDP growth ending the year at only 2% in the final quarter. (Unless otherwise stated, all quarterly GDP growth rates reported here are based on real seasonally adjusted annualized rates or SAAR). The world economy has been underperforming during most of its current seven-year expansion cycle, which started in the second quarter of 2009. Its growth rate has been particularly disappointing since 2011, with average quarterly GDP growth hitting only 2.6%. Our latest estimate of average annual growth for 2015 is just 2.6%, but this number could be lowered in the coming months since it is based on incomplete data. In any case, this rate is significantly below our latest estimate of the global economy's potential average long-term rate, which we have revised down from 3.1% to 2.9%.

The emerging markets are continuing to decelerate, the advanced economies are underperforming, and energy and commodity exporters are in a world of pain. For most of past five years, much of the blame for weak world growth has been attributed to a relentless weakening in emerging markets, which have seen their aggregate GDP growth decelerate by a cumulative total of 3.5 percentage points, from a post-Great recession peak of 7.3% in 2011 to 3.8% in 2015, reflecting major structural problems as well as cyclical headwinds. Among developing countries, the worst

performers clearly are the energy and primary commodity exporters; some are already in outright recession, and many more are headed that way. China and other major Asian manufacturing exporters are struggling as well. A variety of structural problems and cyclical headwinds are reducing their exports and investments and triggering capital flight and currency volatility. Meanwhile, the advanced economies' performance has shown some improvement, with their aggregate GDP growth rebounding during the past two years, from 1.1% in 2013 to 1.9% in 2015.

Growth of less than 2.0% is inadequate for getting these economies back in shape, especially since they are still suffering from the lingering adverse effects of the Great Recession. A much more robust pace is needed to strengthen their labor markets and lift their depressed labor participation rates. Higher growth is also needed to lower their fiscal deficits and sovereign debt levels and to enable their governments to reform fiscal policies and set their finances on a sustainable long-term path. Given the advanced economies unfavourable demographic trends, structural reforms to government finances will progressively become more urgent during the coming years. Among advanced economies, the countries with the best-performing economies remain the Anglo-Saxon ones—the United States, United Kingdom, Canada, Australia, and New Zealand—while the Japanese and Eurozone economies remain the laggards.

Household spending in most major economies is holding up well, but for how long? Although global GDP has been averaging significantly below its potential for the past several years, the situation could have been a lot worse, were it not for the resiliency of the household sector in many major economies. Consumers in many countries, particularly those with advanced economies and globally competitive manufacturing sectors, have held up relatively well so far—thanks to very low inflation and interest rates as well as a windfall from collapsing energy prices since 2014. Household spending has provided significant support for economic activity, particularly in the services sector. As long as household spending remains resilient in these economies, there is hope for a stronger performance from the other engines of growth—business investment, exports, and industrial activity. In fact, the latest IHS forecast envisages a global rebound during the second half of 2016. The recovery will be fuelled by central banks' supportive monetary policies, the lagged effect of low energy prices, and a rebound in the global inventory cycle. The downside risks remain high, however, since weakness in industrial activity, business investment, and exports could undermine household spending and trigger a downturn in the services sector.

The major economies

The US economy remains mired in a soft patch, but there is still strong hope for a rebound. Real GDP growth slowed to 0.7% in fourth-quarter 2015 from 2.0% in the preceding quarter, as net exports and inventory each cut 0.5 percentage point from growth; further damage came from declining business fixed investment, exports, and state and local government purchases. Gains in real consumer spending, residential investment, and federal government purchases helped the economy avoid a recession. A sharp deceleration in final sales to domestic purchasers, from 2.9% in the third quarter to 1.6% in the fourth quarter, is troubling and could potentially mean the economy is not likely to pick up much speed in first-quarter 2016. Clearly, the American economy remains in less-than-perfect health, since growth is being held back by both structural and cyclical factors. The primary cyclical impediments are an ongoing inventory correction, the crash in the energy and mining sectors, weak external demand, and an overvalued US dollar. While the drag from the first two headwinds should diminish before the end of 2016, weak external demand and the lagging effects of a strong dollar will likely continue through 2018. To make matters worse, the entire supply side of the American economy is in poor shape. This is reflected in the increasing weakness of the US industrial production index (down 2.0% year on year (y/y) in December 2015) as well as the depressed level of the Institute of Supply Management's manufacturing diffusion index (which registered 48.2 in January). Additionally, recent declines in core capital goods orders are signaling weakness in both domestic capital spending and exports, and we anticipate a decline in manufacturing construction as we approach the end of an American boom in chemical plant investment. So far, household spending has been the primary driver of the US economy, while business investment and government spending have been relatively weak for the most part. A few areas have shown significant business strength, including the auto industry and services. It is questionable, though, whether these pockets of strength can continue while most industrial sectors lag badly. Indeed, real consumer spending decelerated sharply to 2.2% in fourth-quarter 2015, down from 3.0% in the third quarter, and the recent surge in financial-market volatility bodes ill for the first quarter of 2016.

Is the US economy still the world's engine of growth or just the healthiest horse in the glue factory? Prior to the Great Recession, the US economy was often described as the engine of growth for the rest of the world, and US households were often viewed as the consumer of last resort. Since the recession, many analysts have raised major doubts about the US economy's ability to be the driver of the world economy. For a while, it was thought that Asia-Pacific—with its impressive 6.5% average annual GDP growth since 1990 (versus the US economy's 2.4%)— was far more deserving of such a title. Many analysts believe, however, that Asia's economy does not qualify for the title because its huge net exporter position and the resulting excess savings are a drag on the rest of the world. In any case, Asia's recent economic slowdown has badly undermined its case. If Asia does not deserve the title, is the United States then still the leading contender for being the world's engine of growth? Certainly the US economy is not firing on all cylinders as it was in earlier decades, particularly during most of 1980s and 1990s, when it was performing at an exceptionally strong pace. Nevertheless, to a large extent, the US consumer is still a pretty steady source of autonomous demand for the rest of the world. Even though the economy has recently been going through a soft patch, the IHS US Economic Service remains confident that this is a temporary situation and expects a significant reacceleration later in 2016. Our latest forecast anticipates that consumer spending will rebound soon, thanks to gains in employment and disposable income. In addition, improved credit availability and a rise in household formation will boost home sales, household asset values, and sustain the recovery in home construction. Despite a retreat in December, housing permits remain sufficient to support an increase in construction activity during 2016. Our forecast also envisages some pickup in business fixed investment, led by an anticipated gain in demand for information technology, industrial equipment, and commercial structures. As a result, we estimate quarterly GDP growth will reaccelerate from 0.7% in fourth-quarter 2015 to 2.4% in first-quarter 2016, and then average close to 3.0% for the remaining three quarters of 2016. Average annual growth for 2016 as a whole is likely to come in at 2.4%, but this is largely because of low growth during the second half of 2015, rather than sustained weakness during 2016. Indeed, the projected quarterly GDP growth for the four quarters of 2016 should average 2.9%—a much stronger figure than the 2.4% annual average.

The Eurozone's cyclical recovery will continue to face an uphill struggle. The region's preliminary GDP data release showed that its economic recovery remains in low gear, with GDP growth registering 0.3% q/q in fourth-quarter 2015. The y/y fourth-quarter growth was 1.5%, putting it slightly below the preceding quarter's 1.6% y/y growth. Many news reports interpreted this as good news because the average annual growth for 2015 as a whole came out to 1.5%, the strongest since 2011. This is hardly anything to brag about for an advanced economic region that aspires to rival the US economy, however. The cold reality is that after a surprisingly strong performance in the first quarter of 2015, the Eurozone economy has decelerated for the past three consecutive quarters, and recent data releases, the latest survey evidence, and increasing financial-market turmoil suggest mediocre growth during 2016. The Markit manufacturing purchasing managers' index (PMI) decreased 0.9 point to 52.3 in January, while the services PMI fell 0.6 point to well under 54.0. Additionally, the European Commission reported that overall Eurozone business and consumer confidence declined to a five-month low during January. To be sure, some support for the economy will come from the strong US dollar (which has increased the region's global competiveness), lower energy prices, and the increasing likelihood of additional monetary support from the European Central Bank (ECB). IHS therefore expects the Eurozone to continue its mediocre cyclical recovery without any significant improvement in GDP growth in 2016. We envisage average annual GDP growth will come in at 1.6% in 2016 before accelerating to 1.9% in 2017—still not strong enough to bring down the region's 10% unemployment rate to something more respectable anytime soon. Meanwhile, the risk that the economy might falter will remain substantial—especially given the region's rising political risk stemming from Islamic extremism, disorderly migrant inflows from the Middle East and Africa, and the rising influence of populist right-wing political movements.

United Kingdom: what is a sustainable growth rate for the UK economy? After recording a remarkably strong average annual growth rate of 2.9% in 2014, the United Kingdom's GDP growth came down to earth in 2015, expanding a more modest 2.2%. This is a sustainable figure, since it is very close to the economy's historical average annual rate of 2.0% during the past 25 years, and is consistent with our estimated potential growth of 2.1% during the next several decades. The economy is currently being supported by a weaker pound, an accommodative monetary policy, lower energy prices, and rising employment and wages (including the introduction of the so-called National Living Wage). Nevertheless, we expect economic activity will be a tad weaker in 2016 because of a modestly tighter fiscal policy and a spike in financial-market volatility. Our latest forecast projects GDP growth coming in at 2.1% in 2016, compared with 2.2% in 2015. If the recent global financial-market volatility continues, however, the drag on UK economic activity will be greater than anywhere else in Europe, given the relatively greater size of London's financial market and its importance for the country's economy. Growth could also be further dented by uncertainties regarding the country's membership in the European Union. The government's plan is to hold a referendum on EU membership on 23 June, but odds are that the country will vote to stay in the European Union.

Japan's on-again, off-again economic expansion switched to off-again last quarter. Despite the Bank of Japan's continuing aggressive liquidity injection and the government's deficit spending measures, the economy remains weak and unsteady. GDP contracted 1.4% in fourth-quarter 2015, following a 1.3% increase in the preceding quarter. The weakness at year-end 2015 largely reflected a sharp decline in consumer spending (down 4.4% y/y in December). The economy's other soft spots were home construction, business inventories, public investment, and exports. Net exports did add 0.1 percentage point to GDP growth, but this was only because the decline in exports was outpaced by a larger decline in imports. The fall in imports was due to the cumulative effect of the yen's depreciation as well as falling household spending, while the contraction in exports was the result of falling demand for Japanese export goods in emerging markets, particularly energy and mineral exporters. The weakness in consumer spending last quarter stemmed stagnant income growth as labour cash earnings were nearly flat, rising merely 0.1% y/y. While Japan's GDP growth is likely to turn positive during first-quarter 2016, weak external demand and stagnant income growth are likely to remain significant headwinds for the foreseeable future. Nevertheless, our latest forecast envisages a significant pickup in economic growth, boosted by a weak yen, additional monetary policy stimulus, and low energy prices. Our forecast projects GDP growth accelerating from 0.6% in 2015 to 0.9% in 2016 before edging back to 0.6% in 2017. The 2017 deceleration is due to a scheduled increase in Japan's national consumption tax, from 8% to 10%, in April 2017. We expect the tax increase to result in a forward shift in household and business spending, thereby dampening activity once it takes effect. This is going to be more or less a milder version of what happened with the previous consumption-tax hike in April 2014.

China's policymakers do not seem to have the right formula for taming the country's deflationary pressures. China exited 2015 with weakening economic momentum and rising deflationary pressures. GDP growth came in at 6.8% y/y in fourth-quarter 2015. Unfortunately, the economy is being held up by extraordinary monetary and fiscal policy measures that intensify its financial imbalances and misallocation of resources. Fourth-quarter growth was the slowest since the first quarter of 2009, when the economy was in the midst of the Great Recession. Annual growth for 2015, which came in at 6.9%, was the slowest since 1990. Meanwhile, deflationary pressures seem to have become worse in recent months, with business pricing power and profitability declining and excess capacity and debt levels rising. As a result, the prices of final producer goods and exports are both declining. Clearly, the country's goods-producing industries face enormous deflationary pressures. These problems are reflected in the increasing volatility of China's financial system as well as its severe capital flight. Indeed, the economy's recent deceleration has been partly due to a marked slowdown in financial-services activity. December data showed significant slowdowns in industrial production, retail sales, and fixed investment. The official manufacturing PMI from the National Bureau of Statistics (NBS) declined 0.3 point to 49.4 in January—the sixth consecutive month figure below 50.0 points. The PMI's output growth component slowed, as did its new orders index. Meanwhile, the country's official nonmanufacturing PMI decreased 0.9 point to 53.5 points in January, signalling a loss of momentum. Both surveys indicated declines in export orders and employment. Given the economy's current trends and policy outlook, IHS believes the economy is likely to slow further in 2016, with GDP growth anticipated to come in below 6.5%. We do not expect a hard landing in 2016, nor in the next few years, since the authorities would likely implement a variety of policy measures to keep GDP growth above 6.0%.

Are Chinese policymakers likely to go for a major devaluation of the renminbi? China's decision to carry out a modest devaluation of the renminbi in January was designed to boost exports and contain deflationary pressures. The devaluation appears to have contributed to the global financial markets' increased volatility during the first two months of 2016. Some analysts think policymakers may go for a much bigger devaluation in 2016 to boost the competitiveness of their exporters and prevent further deflationary pressures. A major renminbi devaluation is very risky for the country, given its economic and financial imbalances. IHS believes that such a devaluation is unlikely, given Chinese policymakers' preference for stability. The most probable renminbi policy choice is thus to implement a moderate but less predictable devaluation, while using tax breaks and credit injections to help lessen the pain for exporters and other business enterprises under financial stress. China is also likely to impose stricter capital controls to buffer its monetary policy easing from currency-market effects. We expect the renminbi to depreciate by only about 5% during 2016.

India's headline GDP growth now surpasses that of China, but are the data credible? India's new GDP series, introduced in 2015, seem increasingly disconnected from high-frequency indicators, including as PMIs, core industry output, and price data. According to the latest official report, India's GDP surged 7.7% y/y during July–September and 7.3% y/y during

October–December, far surpassing China's growth during the same period. Such robust top line growth figures are so utterly out of line with many of the government's other economic and financial data releases that many analysts no longer consider them credible. For example, aggregate investment has sharply decelerated during the past year, registering growth of only 2.8% y /y in the last quarter of 2015. Also, a sharp fall in the country's real imports (down 11% y/y) normally means domestic demand must be collapsing, rather than surging by 7–8%, as suggested by the headline GDP. Similarly, merchandise exports, which have been declining for 13 straight months through December 2015, were down 14.7% y/y at the end of 2015—thereby bringing the decline for the full year to 17.3%. As a result, the country's overall trade deficit has started to widen, which is not good news for the broader economy, since this raises the risk of the economy overheating and forcing the central bank to tromp down hard on the monetary brakes. To make matters worse, forward-looking data highlight falling business confidence and possible retrenchment in capital spending. For example, investment proposals were down 74% y/y during the last quarter of 2015, while commissioning of new projects fell 49% y/y—the lowest level since September 2008 (amid the downturn resulting from the Great Recession). With India's steel industry now involved in a trade war with China, one can expect further troubles ahead for all heavy industries. To be sure, India's economy has benefited from pent-up demand unleashed by the central bank's easing of its monetary policy. Furthermore, government spending on infrastructure will provide some support for the economy. Government investment is not a substitute for the scarcity of private investment, however, and pent-up demand is not likely to last more than a few more quarters. For India to even aspire to duplicate China's economic performance, it will need to make its economy a lot more competitive globally than is the case currently. In particular, it needs to open up its industrial sector to foreign competition, deregulate its markets, greatly reduce red tape, and carry out fiscal reforms. Otherwise, it is condemned to a boom-bust pattern of growth, in which a few years of growth will inevitably be followed by sharp downturns, if not many years of stagnation, similar to the experience of most Latin American economies.

Brazil's economy is mired in a drawn-out recession, and the outlook is grim for the near term. The country's GDP contracted by close to 4% and its industrial production plunged as much as 9%, according to the latest IHS estimates. The freefall in economic activity accelerated during the second half of 2015, with overall industrial production dropping by more than 12% and capital goods production diving by more than 31% y/y in November 2015. To make matters worse, the forward-looking domestic orders continued their decline, suggesting the economy could further deteriorate during the coming months. The situation is deteriorating on the labor front as well, as Brazil's six largest

metropolitan areas lost 620,000 jobs and their combined jobless rate rose to 6.9%, up from 4.8% a year earlier. A nationwide survey by the Ministry of Labour estimated that 1.6 million "formal" jobs were lost during 2015. Further, latest available data show average income was down 5.8% y/y at the end of 2015. Meanwhile, capital flight, high inflation, and downward pressure on the country's currency (the real) are limiting the central bank's room to manoeuvre; it has raised its benchmark Selic rate to an oppressive 14.25%. There cannot be any relief on the fiscal front, either, since the government's fiscal deficit is close to 10% of GDP, and any further deficit spending risks hyperinflation. Currency depreciation and a severe drought in rural areas have already pushed consumer price inflation above 10%—the highest since 2003. Capital flight and deteriorating terms of trade (mainly due to the collapse in global iron-ore prices and other raw material prices) are continuing to depress business confidence and investment. Brazil's manufacturers are not benefiting much from the currency depreciation because their products have a high amount of import content; protection by high trade barriers have made them uncompetitive versus Asian manufacturers. Clearly, Brazil's economy needs massive structural reforms and fiscal adjustment to get itself out of the current rut. The costs of such measures will be painful for the population and business community, making them very difficult for the government to execute, given the country's contentious political situation. IHS expects the political fissures within the government's coalition to delay—and possibly derail—any major policy initiatives. A widespread perception among Brazilians that the country's economic and political elite are incompetent and corrupt has completely eroded the legitimacy of Brazil's business institutions and government. It is no wonder that business sentiment and consumer confidence have plummeted to record lows.

Russia's economy will likely contract for another year, and the longer-term outlook is also unfavourable. Capital flight, sanctions, and falling export prices have taken a heavy toll on Russia's economy and financial system. In 2015, the economy had its worst performance since the global recession of 2008–09, and December data releases revealed a continued steep economic contraction more or less across the board. Real disposable cash income was down 4.0% y/y in 2015. This reflected a high inflation rate (nearly 16.0% y/y in 2015) and a sharp weakening in the labour market, characterized by wage cuts, reduced hours, and furloughs. Industrial production was down 4.5% y/y in December, reflecting steep declines in textiles and apparel, footwear and leather products, general machinery and equipment, and transport equipment. Natural resource extraction (up a modest 0.3%) was the only non-agricultural sector to record an increase in 2015. Retail domestic trade turnover was down more than 15% y/y in December. The economy's contraction was also sharp in the export sector, but net exports provided some support for the overall economy thanks to an even sharper drop in imports. The decline in capital spending (down 8.4% y/y in 2015) was particularly damaging to the economy, since it will depress Russia's private-sector productivity, which had been rather low. The government's budget deficit target (which amounts to 3% of GDP) requires further cuts in spending, but this may prove inadequate, given the decline in global energy and other primary commodity prices. Even though Western sanctions are greatly damaging to Russia's economy and financial system, the agriculture sector is benefiting from Russia's retaliatory sanctions. Specifically, President Vladimir Putin's ban on food imports from the United States and Europe has provided a strong shot in the arm for Russia's farm sector. Russian farmers are also being aided by the rouble's sharp depreciation during the past two years, since it has made food imports far too expensive for most Russians. Similarly, the energy and mining sectors have benefited somewhat from the depreciation of the rouble, which has enhanced their competiveness. Nevertheless, the economy's overall situation remains grim. The January Markit PMIs show both manufacturing and services are continuing to contract. If oil prices remain well below the federal budget's assumed price of USD50 per barrel during 2016, then the government will have to further cut its spending, and the rouble is likely to remain under pressure off and on during at least the first half of 2016.

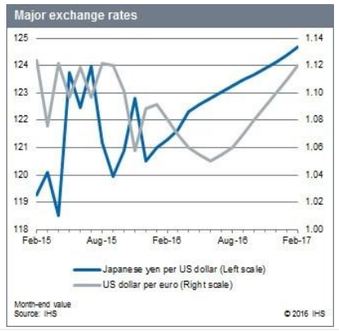
D.2 Business and market conditions

Commodity markets: Finally levelling off? After falling 4.6% in the first four weeks of 2016, the IHS Materials Price Index (MPI) rose in early February. While prices have pushed lower than expected, IHS believes markets are at or near bottom. As 2015 ended, a selection of commodities—rubber, lumber, and pulp—appeared to have already reached price lows. We can now add iron ore, aluminium, and nickel to this list. Crude-oil markers continue well below USD35 per barrel, with high volatility. There are growing concerns about accumulating stocks, especially in the United States, and oversupply is expected to remain for several months. The IHS oil-market view is predicated on the following market conditions:

1. Demand growth will remain robust, although weaker than in 2015.
2. US production will continue to fall.
3. OPEC will not implement production cuts.
4. Iran will increase its output by about 400,000 barrels per day by the end of 2016.
5. Non-OPEC, non-US production growth will cease as the project pipeline begins to wane.
6. Stoppages space will not be exhausted in the near term, especially in the United States.

Consequently, IHS forecasts the price of Dated Brent to average USD38 per barrel in 2016, USD49 in 2017, and USD59 in 2018—about USD10 per barrel lower than January's projections.

Inflation: Is the central bank's 2% target coming within reach? With commodity prices looking for a bottom, perhaps successfully this time, and some inflation indicators in key economies such as the United States and the Eurozone showing signs of life, there is a growing sense that inflation—both of prices and wages—will begin a slow rise, at least in the developed world. Specifically, Eurozone consumer prices are showing signs of life recently, increasing 0.4% y/y in January—the fastest pace in 15 months. Eurozone core inflation (excluding food, energy, alcohol, and tobacco) also edged up, rising to 1.0% y/y. The Eurozone is expected to avoid renewed deflation thanks to the euro's depreciation and its cyclical economic recovery, but core inflation is likely to remain tame for the foreseeable future. There are also signs of a slight acceleration in wage gains in the economies that have recovered the most, notably the United States, United Kingdom, and Germany. In three of the last four months, US average hourly earnings have risen between 2.5% and 2.7% (annual rate), the most since the summer of 2009. Moreover, real German wages in 2015 rose at the highest rate in 20 years.



Monetary policy: Japan joins the negative rate club, while the Federal Reserve (Fed) may delay its next rate hike. Worried about anaemic growth and the potential fallout from a (so far small) devaluation of the Chinese renminbi, the Bank of Japan (BoJ) jumped on the negative interest-rate bandwagon, joining the European Central Bank (ECB) and the central banks of Denmark, Sweden, and Switzerland. Roughly one-quarter of the world's economy is now in negative (short-term) rate territory. Given concerns about equity- and commodity-related stress in Eurozone banks, the ECB will likely push short-term rates further below zero in the near future. Meanwhile, there is a growing consensus that, because of the financial-market turmoil and the darkening emerging-market outlook, both the Fed and the Bank of England will delay future rate hikes. IHS now predicts that the earliest the Fed will raise rates again will be in June, and that there will only be two increases in 2016 (lower than the four expected in January). Similarly, the Bank of England is unlikely to raise rates in 2016.

Currency markets: The flight to safety has undermined the effects of many central bank actions. Part of the fallout of the recent financial-market mayhem has been a flight of capital out of emerging markets—including China—and into developed economies. One indication of this has been a 50-basis-point retreat in US 10-year Treasury bond yields since the Fed hiked its federal funds rate in December. The flight to safety has put upward pressure on the dollar. The flight to safety has also pushed up the value of the euro and yen. This has happened despite the ECB's commitment in late January to provide as much stimulus as needed to safeguard the Eurozone's financial system and the Bank of Japan's dramatic move to "go negative" on its interest rates—following in the footsteps of three other monetary authorities: the Swiss, Swedish, and European central banks. As a result, the euro jumped to a three-month high against the dollar, while the yen rose to levels last seen in 2014. This likely means most major central banks will become more aggressive in providing stimulus for their financial systems.

Business sentiment: The effects of financial volatility have been limited—so far. While financial-market volatility has remained high in the past few weeks, the effects on global business confidence have remained remarkably—and reassuringly—small. Sentiment in the manufacturing sectors of the US, Eurozone, and Japanese economies has deteriorated a little, but manufacturers have become more upbeat (or less downbeat) in the United Kingdom, India, Brazil, and Russia. Similarly, while business sentiment in the service sectors of the US, Eurozone, and Chinese economies has become slightly less upbeat, sentiment is still comfortably in expansion territory. Meanwhile, the mood in the service sectors of Japan, India, and Brazil has improved. The so-called "headline effect," which often accompanies protracted periods of stock-market convulsions, has taken its toll on consumer sentiment in many parts of the world; however, unless there are measurable effects on employment or incomes, the ramifications for consumer spending are likely to be very small.

Earnings and stock markets: Why are oil and stock prices positively correlated? One of the bigger puzzles in the past few weeks has been the positive correlation between oil and equity prices. One possible explanation for this is that markets fear falling oil prices are a reflection of weak (falling) global demand and possibly an early warning of a global recession. However, given that the recent declines on oil prices have much more to do with too much supply than too little demand—in fact, demand has been quite resilient—then the signals emanating from oil markets can plausibly be viewed as a net positive. Another possible explanation is that high levels of leverage in the energy sector point to stress in the US financial sector—and that energy is the new subprime. The recent sharp rise in the US high-yield corporate energy bond index lends credence to this view. Furthermore, there is little doubt that the exposure of US banks to leverage in the energy sector has risen significantly in recent years. However, the share of energy-related debt in US bank balance sheets in 2015 is far smaller than the exposure to housing-related debt in 2007. All this means that the high positive correlation between oil prices and the stock market is likely temporary and more a function of the "fear factor" than anything more substantial.

IHS has revised down the world economy's potential growth from 3.1% to 2.9%. If world GDP growth remains below its long-term trend, as it has for most of the past six years, there is some risk that the next financial-market crisis turns into a much deeper recession than was the case with the Great Recession of 2008–09. There is also the possibility of protracted growth stagnation such as what Japan has experienced since the country's property bubble collapsed in 1990. To prepare for such a crisis, central banks need to normalize their monetary policies and governments ought to lower their debt burdens, but unfortunately, this has not happened in most countries. This failure is to a large extent because the global economy's economic growth has become overly dependent on continued monetary and government stimulus measures. The authorities fear that normalizing their policies would reduce economic growth and reignite deflationary pressures. It does not help that the world economy has in recent years been far weaker than most decades in the second half of the 20th century. Indeed, global GDP growth has averaged less than 2.2% since the start of the Great Recession in 2008. Furthermore, growth has been far weaker in advanced economies. The poor performance of the world economy during recent years suggests that the potential GDP growth of many economies is lower than many forecasters have been assuming. During the past several months, IHS has done a detailed reassessment of potential growth of all economies, and as a result, we have significantly lowered them in our latest forecast, which was released on 15 February. Our latest current estimate for the world's potential long-term GDP growth is 2.9%, versus the previous estimate of 3.1%. To be sure, the new figure is still significantly above the world's average GDP growth of 2.8% during the past 26 years (1990–2015) and 2.7% during the past 16 years (2000–15). In our view, global GDP growth has averaged just 2.6% during the past four years (2012–15) because of major economies' short-sighted policies. With better polices, the world economy should be able to sustain GDP growth rates of 2.9%. World growth that exceeds 2.9% would not be sustainable for very long, however, especially when the major economies are at (or near) full employment and production capacity.

Given the world economy's unsteady growth in recent years, another recession could ignite more dangerous deflationary pressures. Growth rates are far short of our latest estimate of the global economy's potential sustainable growth rate of 2.9%. Fortunately, we expect the pace to pick up considerable speed in 2016 and sustain an average growth of 3.2% during the next five years (2017–21). Given the unsteady pace of world growth since the Great Recession, though, there is considerable risk to this forecast. There have already been quite a few "head fakes" in the past several years, when GDP growth has briefly reaccelerated (e.g., in second-quarter 2010, third-quarter 2011, first-quarter 2012, third-quarter 2013, and second-quarter 2015), but in every one of these cases, there has been a subsequent period of deceleration and extended weakness. Given the world economy's still-substantial output gap, any renewed global economic weakness could leave the global economy vulnerable to external shocks, which could intensify deflationary pressures. Fortunately, the major central banks have become quite vigilant in the aftermath of the Great Recession and have employed aggressive monetary stimuli to contain deflationary pressures.

Periodic spikes of financial-market turmoil during the current business cycle are reminders that the global economy is still fragile. Even though the current global expansion has entered its sixth year, some areas of the world economy are still weak. The damages inflicted by the Great Recession to some sectors were so severe that the global economy and financial system will not be back to full health for some years. The problem is most severe in the case of advanced economies' real estate, construction, banking, and household sectors. In some countries, these sectors will need several more years to regain their precrisis vitality. Some goods-producing sectors will also need years to get back to full health. For example, despite its impressive v-shaped rebound during the five quarters from second-quarter 2009 through the second-quarter 2010, global manufacturing still has a huge excess capacity problem in some sectors (e.g., automobiles, steel, and aluminium). In the case of steel and automobiles sectors, the problems are structural, and remedying them will require major reform and restructuring and retirement of less-efficient plants. Finally, growth in the services sector, which represents nearly two-thirds of the global economy, has generally lagged that of industry because the finances of advanced economies' household sectors have been under pressure from high unemployment, weak income growth, and tight consumer credit. As a result, investor confidence indices are still well below their precrisis peaks and the corporate sector is very cautious about spending and payroll expansion.

A renewed housing downturn remains the global economy's worst nightmare. During the past three years, real estate markets in many emerging markets have boomed (e.g., those of the Philippines, Hong Kong, Singapore, Taiwan, China, India, Turkey, and Brazil), but in many cases, monetary tightening has stabilized prices and in some cases reversed the price increases recently. Meanwhile, real estate markets in some developed economies have remained under downward pressure since the Great Recession, e.g., Spain. In any case, because house prices in many countries around the world were vastly overpriced compared with rent and household income levels, there is a significant risk that prices could undergo another correction over the coming years, particularly if the world economy does not reaccelerate or central banks tighten their monetary policy rapidly. A protracted, synchronous housing crash could further weaken the global economy and unleash powerful, self-feeding deflationary pressure for several years. Given the weakness of banking systems in many countries around the world, a housing crash could trigger a global financial crisis and further damage the world economy. In short, a housing-market crash could unleash an escalating debt-asset deflation the likes of which has not been experienced since the 1930s.

D.3 Medium-term outlook

With global monetary policy expected to remain relatively accommodative for the next few years and the Eurozone authorities having contained their financial crisis, the global economy is now on a much firmer footing than it has been for the past six years. As a result, the likelihood of a global recession will be extremely low over the next several years. IHS anticipates that world GDP growth will average 3.2% per year over the medium term (2017–21). Even though growth periodically might falter, as it has from time to time over the last four years, we believe these setbacks would be temporary and policymakers will manage to stabilize world growth and prevent a global recession. We are now much more confident that conditions are falling into place for an extended period of improving global growth over the medium term. Furthermore, there is a some chance for growth to surprise on the upside in the advanced economies over the short term, thanks to the sharp decline in energy and other raw

material prices, of the potential for much stronger business and household spending, more rapid easing of credit conditions by banks, and the availability of still-substantial underutilized production capacity in many parts of the global economy.

There is nevertheless still some downside risk for growth, particularly if businesses and households do not dip into their savings to spend more aggressively during the coming years. Furthermore, there is also the possibility that the US political system may become gridlocked over debt and spending issues after the upcoming national elections next November. A US political gridlock could damage not only the US economy, but also dent world growth. Under such a scenario, the still-vulnerable world economy would be in a precarious state, given the high debt burdens and fiscal deficits of many countries around the globe, particularly Europe, the United States, and Japan. The economies of these countries need fiscal consolidation that puts their finances on better footing as well as structural economic reforms to foster higher growth—thereby making their debt levels more manageable. Otherwise, sooner or later these countries would find themselves facing another debilitating financial and economic crisis that could potentially be worse than the Great Recession.

The severity of problems stemming from high sovereign debt burden varies a good deal from country to country, however. Because of the structural rigidities of the Eurozone currency union, for example, this region's sovereign debt problems are much more damaging for the regional economy than those of other advanced economies. Fortunately, after a prolonged recession and debilitating financial turmoil, the Eurozone is finally experiencing a cyclical recovery that should last at least several quarters. As we have observed this year, though, the region's recovery is very weak and unsteady. Moreover, many of the Eurozone's structural problems remain unresolved and its cyclical recovery is likely to remain subdued due to a variety of headwinds: continuing deleveraging by households and governments, the rigidities of the region's markets, and an excessively conservative monetary posture from the European Central Bank (ECB).

The other two major profligate spenders, the United States and Japan, have serious sovereign debt problems as well, but they have more time to get their sovereign debt situation under control, thanks to having independent central banks that are willing to print money to inflate the denominator of their nominal debt-to-GDP ratios. To be sure, printing money cannot continue indefinitely without dire consequences. Unless accompanied by major fiscal reforms, unrestrained money-supply expansion would eventually lead to a bond market riot that raises sovereign yields to unsustainable levels. Clearly, the major advanced economies need to adopt serious austerity measures to stabilize their debt-to-GDP ratios (i.e., by reducing the growth of the nominator) within the medium-term time horizon, if not sooner.

Unfortunately, there is a significant risk that populist domestic political pressures will prevent policymakers from implementing adequate austerity measures that are needed to put their finances on a sustainable path. In such a scenario, relentless intensification of financial market pressures could force the policymakers to make far more severe adjustments under crisis conditions—which could in turn unleash political backlashes. Furthermore, the lingering cyclical weaknesses of the global economy mean some of the measures being applied in some advanced economies to resolve their fiscal imbalances could drive the global economy into a recession and reignite deflationary pressures. To reduce these risks, policymakers need to reassure financial markets by making significant cuts in their countries' long-term fiscal programs in areas such as public health and welfare, while minimizing cuts in their short-term spending programs, such as typical countercyclical expenditures. Such a balancing act is very difficult, given the increased populist pressures on the politicians since the Great Recession.

The Great Recession that engulfed the global economy in the second half of 2008 was the most severe downturn since 1947, and some of its adverse consequences were bound to linger on for years. The global financial system was severely damaged by the panic among investors and bankers and the collapse of global trade, which reached alarming proportions in the months following the collapse of Lehman Brothers investment bank in September 2008. Within an eight-month time period through April 2009, global industrial output and world trade experienced their deepest declines since World War II, and the resulting widening global output gaps ignited powerful deflationary pressures that proved difficult to fully contain.

Fortunately, the global economy's downward spiral during the Great Recession did not last more than two quarters. The contraction of world GDP moderated rapidly before the end of first-quarter 2009, and output expansion resumed in the second quarter—but this was achieved through extraordinary policy actions that to some extent have undermined stability and growth since then. Since the start of its expansion in second-quarter 2009 (29 quarters ago), quarterly world GDP growth has averaged only 2.9% per year and a lackluster 2.6% during the last 20 quarters (since first-quarter 2011). (Unless otherwise mentioned, all quarterly GDP growth rates reported here are measured as seasonally adjusted annualized rates). Given the depth and duration of the global economic downturn, this pace has not been adequate for reducing the high global unemployment rate or the world economy's still-substantial output gap. Furthermore, the recovery has been very unsteady and geographically uneven during the past 22 quarters. After accelerating for five quarters, from a 6.7% contraction in fourth-quarter 2008 to a quarterly peak of 5.2% growth in second-quarter 2010, world GDP growth slowed sharply to 2.4% in first-quarter 2011 and since then has averaged only 2.6%—well below its long-term trend rate of 2.9%.

It is normal for a post-recession recovery to undergo some deceleration after a strong initial rebound (particularly when the recession's major cause had been high debt levels), but in this case the initial snapback was less than what one would expect after such a deep recession, and the subsequent weakening lasted far longer than normal. The initial cyclical rebound during 2009– 10, which was fuelled to a large extent by temporary government reflationary policies, pent-up demand, and post-recession cyclical inventory rebuilding from extremely depleted levels, was clearly not sustainable. Furthermore, by pulling some demand forward (such as in the case of government-subsidized automobile purchase incentives), some government programs ensured that the subsequent moderation was sharper and longer than in a normal post-recession recovery.

Fortunately, the advanced economies' fiscal spending constraint is diminishing and some of the other drags on the global economy (e.g., contraction in construction and capital goods sectors) have been dissipating as well. In particular, we expect US and Eurozone business and household investment to accelerate for the next several years. Over the medium term, therefore, the pace of global growth should become stronger, with annual GDP growth averaging close to 3.2% during 2017–21 before gradually edging down to a rate close to its long-term potential of 2.9% per year during the next decade.

Furthermore, there is a good chance for much stronger growth during the next several years than the projections in our baseline forecast. To some readers, this might seem overly optimistic, given the global economy's rather anaemic performance during most of the past five years. We need to keep in mind, however, that there is a good deal of accumulated pent-up demand in the global economy and there is a huge amount of excess production capacity that could come back online in many economies. The excess capacity is the legacy of the deep recession that we went through in late 2008 and early 2009 and the less-than-stellar recovery since then.

There are significant risks to our medium-term forecast, since the global economy is still facing a number of headwinds that could prevent it from sustaining an extended period of above-trend growth.

- Given the damaged state of many advanced economies' financial sectors, we should expect credit growth to be rather subdued relative to most previous post-World War II expansionary cycles. A wounded financial system would be a particularly severe handicap if the recovery continues to be a relatively "jobless" one. It is worth noting that after the two preceding recessions, the subsequent jobless recoveries eventually turned into robust expansions due to excessive liquidity creations by the global economy's relatively healthy financial system.
- The advanced economy's weakened financial systems therefore represent a major handicap for the global economy during its current cyclical expansion.
- Unfortunately, the heavy fines and regulatory burdens being imposed on the financial sectors of advanced economies by politicians (such as the Dodd-Frank legislation in the United States)

are further undermining the effectiveness of the global financial system. In particular, these burdens have constrained credit issuance by banks to small and medium-sized businesses.

- The global economy's outlook is also constrained by some economies' high household-debt burdens, which have led to higher personal savings rates and, consequently, weaker consumer spending. The retrenchment should gradually moderate, as the higher savings lower household debt levels and the value of household assets increases with rising equity markets and stabilizing housing sectors.
- Another headwind facing global growth over the coming years is many economies' unfavourable government finances. In most major industrialized economies, public finances deteriorated sharply during the Great Recession and the subpar recovery since then has not been helpful, during which governments have been forced to use fiscal pump priming to support their beleaguered economies. So far, the pressure on government finances of countries with high debt burdens has not eased to comfortable levels in most cases because elevated unemployment rates have maintained countercyclical spending at high levels, revenue recovery has been dismally weak, and periodic financial market volatility has discouraged governments from aggressive revenue-enhancement measures. Meanwhile, the longer-term financial outlook for many advanced economies is unfavourable because of the failure of most of their governments to implement adequate fiscal reforms to prepare for the rising health and welfare costs of their aging populations. The need to raise fiscal revenues and pay off some of the recently accumulated public debt means that rising taxes will be a significant headwind for global growth over the medium term. In addition, there is some risk that some governments will opt for monetizing their debt, which could destabilize financial markets and depress average growth over the longer term.
- Because most major central banks lowered their policy rates to record-low levels and adopted other extreme reflationary measures to support growth and contain deflationary pressures during the global economic downturn, monetary conditions could become a significant headwind for global economic growth over the medium term. Given that sooner or later these central banks have to start to normalize their policy rates and unwind their other reflationary measures, their economies' growth rate will likely remain somewhat subpar for an extended period.
- Weak housing markets in many parts of the world will likely remain a significant headwind for the global economy for some years as well, since house-price adjustments in many major economies could take a long time before the market finds a solid footing. Because house prices tend to be downwardly sticky, their downward adjustment tends to occur slowly, sometimes taking as much as 10–20 years to run their course. In Japan, for example, land prices were on a downward trend for two decades after the country's property bubble crashed in 1990.
- Finally, political gridlock and/or weak governments in many countries will prevent timely implementation of urgently needed fiscal adjustments and structural reforms, thereby increasing the chances of an upsurge of further financial-market volatility over the coming years. A sudden decline in bond prices, for example, could finally push policymakers to implement the needed reforms, but recent political developments in the United States, Japan, and the Eurozone have not been very encouraging. If the negative reactions of financial markets fail to force reforms in the next few years, there is some chance that disorderly adjustments (such as a US dollar or euro crash) could trigger another severe recession and push the global economy to the edge of a deflationary quagmire.

The previously mentioned headwinds could constrain world growth over the medium term. As a result, the world economy's expansion could lag what we are projecting for the medium term. For example, the labour markets in advanced economies might see weaker recoveries than we are currently envisaging. Furthermore, the damaged global banking system might not be able to provide support for the type of sustained, robust growth that our forecast envisages for the next five years. To be sure, global lending and credit growth will likely pick up a good deal from its current still-subpar pace over the coming quarters, but it might remain well below its pre-Great Recession level over the next few years. Given the deep wounds inflicted on the global financial system, it might take more years for global lending to get back to its "normal" precrisis level.

The latest IHS baseline forecast, released on 15 February, projects world GDP growth averaging 3.2% per year during the next five years (2017–21). Thus, over the medium term, we expect global growth to average 0.3 percentage point above its sustainable long-term potential of 2.9% per year. During this period, the US economy is expected to maintain its lead over other advanced economies, and China and India are expected to be the growth engines for emerging markets. If the US economy falters during the coming years, on paper at least, the economies of emerging Asia, Western Europe, and Japan are large enough to do some of the heavy lifting, thereby supporting the global economy's expansion. Given emerging Asia's heavy dependence on exports, however, it cannot generate strong autonomous growth for an extended period independent of strong import demand in advanced economies. Thus, for the world economy to reach its full growth potential, the advanced economies (especially the struggling economies of Western Europe and Japan) need to achieve better performances than they have had so far in the current cyclical expansion. Unfortunately, this scenario appears highly unlikely, as the Eurozone's economy is likely to be held back by its sovereign debt problem, damaged banking sectors, and poor international competitiveness, while Japan's accident-prone economy, despite "Abenomics," is likely to have difficulty in sustaining robust growth for more than a few quarters: Japan's real GDP growth has averaged only 0.8% since 1992.

Now and then, it is possible for the economies of the Eurozone and Japan to outpace the US economy for a quarter or two, but not for long. Any outperformance of the US growth by either the Eurozone or Japan would be transitory and unlikely to be sustained, given the American economy's greater flexibility and superior potential. The Eurozone's market rigidities, along with its fiscal and monetary policy constraints and low population growth, prevent the region from sustaining a pace-setting role over the medium term. For European growth to surpass that of the United States for more than a year or two, the European Central Bank (ECB) would have to abandon its conservative monetary policy and be willing to tolerate higher headline inflation rates as well as become the "lender of last resort" to the region's banks and sovereigns during financial crises. In addition, the governments of core Eurozone economies—Germany, France, Italy, and Spain—would have to greatly reduce their welfare spending to build up a cushion that allows them to ignore the fiscal constraints under the European Stability and Growth Pact during financial crises and recessions. In the absence of extraordinary doses of reflationary monetary and fiscal measures, European economies would probably always decelerate in line with the US economic slowdown during any downturn, because they have become overly dependent on the US consumer since the Asia financial crisis in 1998.

Japan's GDP growth could get above trend for a year or two thanks to the Bank of Japan's shift to a more aggressive reflationary policy. Over the longer term, however, the constraints on Japan's growth performance are even more severe than those on the Eurozone, given the country's weak public finances, declining population, rising dependency ratio, market rigidities, low immigration rate, and various geopolitical disputes with its neighbouring states.

In short, although Europe and Japan periodically may achieve higher growth rates than the United States, their economies are not able to do so over an extended period. In the long run, the US economy's structural superiority, along with its higher population growth and greater attractiveness to skilled immigrants, should allow it to reassert its growth leadership among advanced economies. Furthermore, US growth over the medium term (2017–21), which we expect to average 2.5% per year, exceeds by a wide margin the projected average rates of Western Europe (1.7%), the Eurozone (1.6%), the United Kingdom (2.3%), and Japan (0.9%).

As noted earlier, the risks to world growth will be significant during the medium term given the wounded state of global financial markets and the advanced economies' unhealthy public finances, which will need years to heal completely. To make matters worse, the global economy will continue to be at some risk from a number of long-standing structural problems and imbalances that may cause another economic crisis before too long. In particular, the rapid growth of global money supply over most of the past 20 years, which has been the root cause of the recent financial crises, has created such severe imbalances in the global economy that no one is really sure how they could be resolved without a prolonged period of painful and potentially very disorderly economic adjustments. One could view the recent recessions and financial crises as a dress rehearsal for a bigger economic calamity some years down the line. The governments' super-expansionary fiscal policies and aggressive monetary support in response to the high-tech crash in 1991, the Peso Crisis in 1994, the Asia Crisis in 1998, the emerging-market crisis in 1999, and the Great Recession in 2008/09, certainly did contain the problems. They succeed in stabilizing financial markets and halting the global economy's contraction. During the Great Recession in particular, unprecedented fiscal and monetary reflationary policies were crucial in stabilizing the global economy and avoiding what could easily have become a disastrous worldwide debt-deflation spiral.

Unfortunately, the price paid for stabilizing global economy has been additional distortions and imbalances. The continuation (and in some cases the intensification) of accommodative monetary policies since then have, in fact, elevated the risks. The resulting surge in liquidity growth has inflated asset bubbles and some primary commodity prices. Once the global economy recovers completely from the damages inflicted by the Great Recession and the Eurozone sovereign debt crisis, we could therefore be facing an increasing risk from asset bubbles and macroeconomic imbalances, which could culminate in a deeper, more prolonged, and less manageable recession and financial crisis over the medium term.

Another risk to the medium-term outlook could be the potential inflationary pressures that have been masked by unorthodox monetary policies that have boosted asset prices and a lack of business pricing power that has suppressed pent-up demand for price increases (as a result of the current weak global growth and capacity glut in advanced economies). Inflationary pressures and inflating asset bubbles could return with a vengeance once the world economy's pace breaks above its long-term trend. After many years of horrendously weak pricing power that date back to the Asia Crisis (1997–98), there is a tremendous amount of pent-up pressure for raising prices in many sectors, particularly for traded goods. Similarly, after years of relatively weak wage growth in major industrialized countries, the tightening of labour markets during a period of above-trend growth could potentially generate relentless upward pressure on wages. The situation could become even more dangerous if populist pressures lead governments to adopt imprudent policies or avoid urgently needed fiscal reforms to stabilize their public finances. To make matters worse, the post-Great Recession rise in anti-business sentiments and disenchantment with capitalism in many countries could lead to increasing market rigidities as a result of over-regulation and protectionist measures that could boost inflationary pressures.

Thus, as the global economy's expansion ramps up and private lending re-emerges from its current depressed levels, central banks would need to tighten monetary conditions to contain asset bubbles and inflationary expectations. Additionally, governments in most advanced economies would have to constrain their spending and raise taxes. There is a considerable risk that the authorities will delay taking timely action. At the same time, though, the authorities need to be cognizant of the dangers of overreaction. Given the high levels of uncertainty that still exist about the advanced economies' prospects, the risks of overreaction by monetary and fiscal authorities are rather high. The problem is compounded by the discomfort many officials feel about the super-reflationary measures they adopted during the second half of 2008 and early 2009 to combat recession and deflation. As economic expansion picks up speed during 2014 and thereafter, policymakers will become anxious to start on a path of reducing their deficits to get their finances under control, normalizing their monetary policies, and unwinding the huge amount of liquidity pumped into the global economy. Under such conditions, the risks of acting prematurely will likely be as high as those of being excessively timid or late.

D.4 Long-term outlook

The long-term growth prospects of the world economy remain generally favourable, but not as rosy as they had appeared in the 1990s. During that period, energy prices were relatively low, and the collapse of the Soviet Union had opened up prospects of rapid economic reform and expansion of globalization in the former-Communist world, thereby leading to widespread euphoria regarding "peace dividends" and "a new world order." The current outlook appears even more sober when contrasted with the spectacular economic growth projections that were popular during the heyday of the "new economy" in the late 1990s.

The "new economy" was brought down to earth with the bursting of the high-tech and telecommunications bubbles in 2000. Most assessments since then have concluded that potential boosts to aggregate productivity from technological advances would be much more modest than was frequently asserted in the late 1990s.

It is now widely accepted that the "new economy" has operated on exactly the same principles as the "old economy." Although technological improvements in computers, telecommunications, biology, nanotechnology, energy, mining, agriculture, and other fields will likely lead to spectacular results in some sectors, their impact on overall economic growth will not be spectacular. Furthermore, the impressive productivity gains of the American economy during the last two decades now appear to have been mainly the cumulative results of the country's market deregulation and corporate-sector restructuring in the 1980s, global trade liberalization in the 1990s, an overinvestment binge in high tech in the 1990s, and speculative investment bubbles in housing and financial services rather than any "new economy" magic.

The latest detailed forecast of the world economy from IHS projects an average annual GDP growth rate of nearly 2.9% through 2047. (Unless noted otherwise, all world and regional GDP growth rates are based on country GDP numbers converted to US dollars at market exchange rates. Based on purchasing power parity exchange rates, the global economy's long-term trend growth rate would be closer to 3.4% over the next 30 years.)

The key economic assumption underlying the long-term forecast is that the productivity gains from new technological advances will moderate the impact of the secular, long-term slowdown in factor accumulation (i.e., increases in quality and quantity of labour and capital stocks). In other words, a combination of capital and labour productivity improvements—resulting from technological breakthroughs, incremental advances in production processes, improvements in business organization and management techniques, and an increasingly more educated and skilled labour force—would, in the long term, partly compensate for the slowdown in labour-supply growth (due to demographic trends) as well as for the downward trend in capital stock growth (due to lower global savings and investment rates).

The other major assumption underlying the long-term forecast is that the post-World War II global trends will remain intact over the long-term forecast horizon. More specifically:

- Aggregate world population growth will continue its gradual, secular long-term decline from 1.1% annually in recent years to 0.5% in 2050.
- Domestic-saving rates of developing economies increase as incomes rise in the early stages of economic development, but they will moderate and decline in the later stages as populations age and households' propensity to consume gradually edges up.
- The world economy will not face any extended, severe petroleum supply shortages in the next 30 years. Recent oil discoveries of huge quantities of shale oil in tight formations in the United States suggest the world economy will have plenty to fuel its growth for as many as another 100 years. Since the discovery and extraction of the new oil supplies are usually much more costly than the traditional sources, however, global oil prices will have to remain at relatively elevated levels for at least the next 10 years to generate the huge amounts of capital needed for upstream petroleum investment.

- IHS expects the per-barrel price of Brent crude oil to remain under downward pressure during the next several years as a result of increasing discoveries of “tight oil,” and competition from unconventional energy sources. Oil prices could rise modestly as demand increases in line with firmer global GDP growth during the medium term, but rising non-OPEC supplies will likely keep prices under some pressure over the next few years.
- Over the longer term, though, we expect demand growth will raise prices as production from super-giant fields decays and huge amounts of capital will be needed to find and extract oil from the more costly fields (e.g., deep offshore locations and more complex geological formations) and unconventional sources (e.g., Venezuela’s Orinoco reserves and Canada’s tar sands).
- The global economy will not fall into a deflationary trap. The current pockets of deflation will gradually disappear during the next several years as the world recovery advances, central banks normalize their policy rates, and governments in advanced economies carry out fiscal reforms to lower their deficits and put their finances on a more sustainable footing for the aging of their populations. As a result, the aggregate global fiscal deficit declines from 3.1% of GDP in 2016 to 1.9% of GDP in 2020, 1.2% in 2030, and then gradually edges down over the subsequent decades to 0.8% of GDP by 2046.
- Most advanced economies generally avoid imposing excessively burdensome environmental regulations on their economies, but instead adopt incremental approaches in order to avoid disruptive adjustments. Moreover, where such policies are adopted, they do not last for long, as they are soon overturned when the costs become obvious to the people.
- The major industrialized countries do not allow their commercial disputes to frustrate global trade liberalization or to degenerate into a major, competitive trade war. At the same time, we do not expect any major breakthroughs on agricultural subsidies or other major trade disputes. In short, trade liberalization will continue, but as in the case of environmental regulations, at a slow, incremental pace.
- Thus, world export growth will outpace GDP expansion in real terms over the next three decades (we project the average annual pace of export growth to come in at 3.9% versus 3.1% for GDP growth over the next 30 years). In nominal terms, though, the two growth rates will more or less match each other due to a lower inflation rate for exports versus GDP. As a result, the ratio of the nominal value global exports to nominal GDP is projected to remain stable at roughly 23–24% over this period.
- With China’s investment growth already on a downward path, primary commodity prices will remain under pressure for the foreseeable future. Given that the global commodity prices are still well above their average long-term historical levels (in real terms), they have a lot of potential to decline further over the coming years. As in the case of oil, though, we do not expect the real prices of primary commodities to fall to their long-term historical averages over our 30-year forecast horizon, because marginal production costs are unlikely to fall to the much lower levels of the 20th century.
- Most emerging markets will not backtrack on their economic reforms on any large scale, but instead will continue the trend toward greater openness, deregulation, and privatization.
- The global trend toward more flexible exchange-rate regimes and greater capital mobility will continue.
- Most industrialized countries will not completely shut their doors to immigration, but will become more selective in their immigration policies.
- No global calamity or geopolitical disaster—such as a world war, accelerated global warming, plagues or pandemics, giant meteor strikes, or other planetary-scale disasters—will depress world population or capital stock, nor will such an event lead to a prolonged depression in world output.

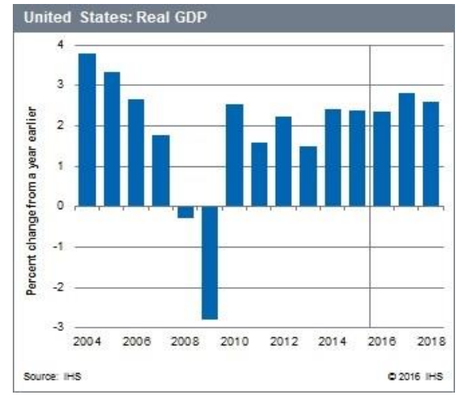
D.5 World: Annual Economic Indicators

	2014	2015	2016	2017	2018
Real GDP	2.7	2.6	2.7	3.1	3.2
Nominal Per-Capita GDP (US dollars)	10,745.4	10,027.4	9,884.0	10,517.7	11,245.7
Industrial Production	2.9	1.5	1.5	2.9	3.2
Merchandise Exports (Billions of US dollars)	1.1	-13.3	-1.7	9.6	9.7
Merchandise Imports (Billions of US dollars)	1.1	-12.3	-2.1	9.6	9.8
Nominal Retail Sales	5.2	4.4	6.3	6.6	6.1
Real Retail Sales	2.9	2.5	3.1	2.9	2.8
Consumer Price Index	2.9	2.4	3.4	3.8	3.6
Wholesale Price Index	1.5	-2.6	0.6	3.9	3.8
Money Supply, M1, Year-end	7.5	10.7	8.8	6.9	5.8
Broad Money Supply, Year-end	7.4	7.8	8.2	7.6	7.3
Policy Interest Rate (Percent)	2.52	2.28	2.34	2.66	3.32
Short-Term Interest Rate (Percent)	3.07	2.98	2.94	3.19	3.73
Long-Term Interest Rate (Percent)	3.90	3.33	3.23	3.55	4.12
Fiscal Balance (Percent of GDP)	-3.1	-3.3	-3.5	-3.3	-3.3

United States

Outlook

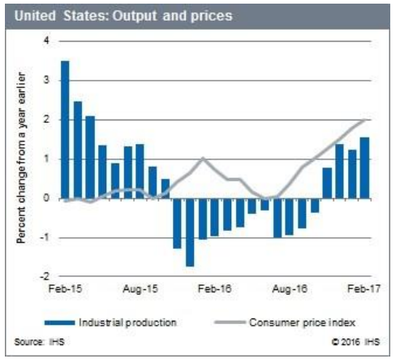
While the revisions to fourth-quarter GDP confirmed a weak finish to 2015, recent data point to stronger growth in the current quarter. There continue to be trouble spots in the economy: excessive inventories, the plunge in energy-sector capital spending, and a big drag from net exports, due to both a strong dollar and weak growth in the rest of the world. Nevertheless, consumer spending and housing will remain enduring engines of growth in 2016.



Fourth-quarter real GDP growth was revised up, from 0.7% to 1.0%. All the upward adjustment stemmed from higher inventory investment than previously estimated. Net exports also contributed to faster growth, as much weaker imports (a positive for growth) were only partially offset by slightly weaker exports. Real consumer spending—still a big plus for growth in the fourth quarter—was revised lower, with stronger growth in services not quite compensating for lower growth in goods. Real state and local government spending was a bigger drag than previously estimated.

Despite these revisions, real GDP growth for 2015 remained at 2.4%, exactly the same as in 2014. The upward revision to real GDP growth in the fourth quarter of 2015 is a positive on the surface, but a negative for the outlook. The correction to inventory levels will take longer than anticipated, causing a moderate downward impact on growth during the first half of 2016.

Meanwhile, incoming data for 2016 point to the durability of household expenditures. Consumer spending surged in January (up 0.5% in real terms), after a dismal showing in December (up 0.1%). In addition to spending more, consumers also saw considerable income gains. The average monthly growth rate in real consumer spending during the November-January period was 0.33%, or nearly 4% at an annual rate. Real consumption growth is likely to be 3.0% in the first quarter, compared with the fourth quarter's showing of 2.0%. The consumer outlook remains right, premised on the continuation of robust employment growth, strong real disposable income gains, and modest inflation. American consumers are doing most of the heavy lifting in the US economy.



The housing market was mixed in January, but the outlook is bright. Homebuilder optimism, housing starts, and new home sales retreated, while existing home sales held strong at the second-fastest pace since February 2007. However, homebuilders expect better sales conditions ahead, and price increases should encourage more homeowners to list their homes for sale, expanding purchase options. Building permits remain relatively elevated, providing a foundation for future momentum in housing starts, and new home sales should follow suit. IHS sees residential investment increasing nearly 9% this year. One very positive indicator is that the mortgage delinquency rate is at an all-time low, indicating that consumer finances are in good shape.

Putting this all together, we expect real GDP growth to rebound to 2.6% in the first quarter. During calendar 2016, the average growth rate is predicted to be 2.3%, while the fourth quarter-over-fourth quarter growth rate reaches 2.6%.

Low inflation and instability in global financial markets are likely to keep monetary policy on hold in March. As US labour markets remain relatively strong, we expect that the Federal Reserve will raise the federal funds rate at its June and December meetings.

Medium- and Long-Term Outlook

Real GDP growth will average 2.3% per year in 2015–45. This is 0.5 percentage point slower than during the past 30 years. The economy's underlying growth will slow as baby boomers begin to retire, slowing labour-force growth. Potential output growth should hold up fairly well in the future, with greater business fixed investment and R&D spending offsetting the slowdown in labour force growth. Eventually, though, the effects of weaker labour-force growth become dominant and, in a sense, self-perpetuating. As output growth drops off, business fixed investment rises more slowly, limiting capital stock growth and thus future output gains.

The outlook for inflation remains moderate. Over the long run, inflation is a monetary phenomenon. Its future course will be determined by policies implemented by Janet Yellen, and her successors. Since we do not know who these successors will be, we assumed the Federal Reserve will try to contain inflation over the forecast period. The Consumer Price Index (CPI) is expected to average 2.3% annual increases in 2015–45, somewhat less than the 2.8% average in 1984–2014. The broader-based GDP deflator will rise 2.1% per year.

Nonfarm business productivity growth averages 1.7% over the projection period. It has slowed sharply since the Great Recession, and its average growth rate for the past four years is 0.4%. In our latest forecast, productivity growth averages 1.7% over the next 30 years, just below its current 50-year average of 2.0%. A caveat: the recent historical productivity estimates are revised several times over several years before they solidify. The effective capital stock (in 2009 dollar terms) is projected to increase 3.7% annually, 0.2 percentage point higher than recorded for 1984–2014.

The current-account deficit remains negative over the forecast period, averaging 2.8% of GDP. A decline in the dollar relative to industrialized-country-currencies, combined with modest unit labour cost growth, will stimulate US exports abroad and result in a steady improvement in the merchandise trade balance (as a share of GDP). IHS Economics projects that real exports will expand at a 4.2% average annual rate over the projection period. Real imports, meanwhile, will grow at a 4.0% average annual rate.

Real oil prices eventually stabilize at about $90 per barrel (2009 dollars). IHS expects the average acquisition price of foreign oil to remain high in the long run. In the end, scarcity tends to bid energy prices up, while new technologies tend to hold them down. Our projection is that these two forces will balance out—and that the real price of oil will stabilize after 2020. Nonetheless, real oil prices will remain high by historical standards.

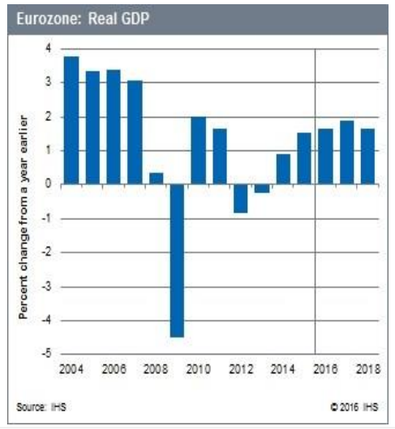
Real consumption growth will average 2.4% per year over the forecast period. Expenditures, in the long term, are primarily determined by the growth of real permanent income, demographic influences, and changes in relative prices. The share of personal consumption expenditures in GDP hovers around 67–70% of GDP over the forecast period. In per capita terms, growth will advance about 1.8% per year, down 0.2 percentage point from the 1984–2014 rate. The share of consumption devoted to services will rise, mainly because of rising health expenditures, while that for goods will fall over the forecast period. The long-term outlook for auto and light truck sales calls for a slowdown in the rate of increase relative to past performance. Real personal disposable income, which climbed 2.9% in 1984–2014, will again rise 2.5% annually over the next 30 years.

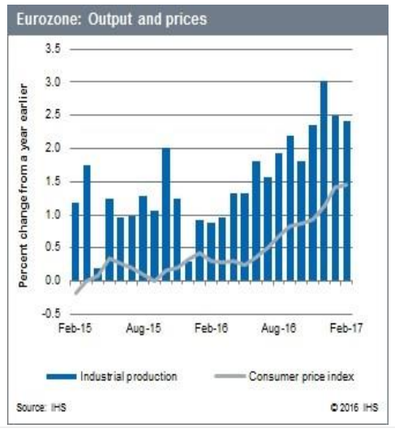
The labour market improves over the forecast period, with the unemployment rate eventually settling at about 4.8%. Slower long-run increases in the labour force indicate more moderate long-run employment growth in the future. Total civilian employment will rise at an average annual rate of 0.7% from 2015 to 2045. Total establishment employment will rise from 139 million in 2014 to 177 million in 2045. Manufacturing's share of total employment will continue to decline over the forecast period, falling to 6.6% in 2045, from 8.7% in 2015. The broad service sector will generate an increasing share of employment growth in the forecast period, although the federal government's share of employment will decline during the forecast period.

The federal budget deficit remains in deficit through 2045. The federal deficit, which peaked at $1.4 trillion in fiscal year 2009 and dropped below $1.0 trillion after fiscal year 2012, gets smaller through 2015, but then starts to increase again. With the economy growing faster than the pace of government spending, the government sector's share of GDP will decline over the forecast period. The state and local government sector maintains the dominant share of total government purchases, growing from 62% in 2014 to 69% in 2045. At the federal level, the military accounted for 62% of federal purchases in 2014, and accounts for 61% in 2045.

Eurozone Outlook

Global growth concerns and associated financial-market weakness and volatility are currently hampering Eurozone economic activity and threatening the modest cyclical upturn that is still supported by decent domestic fundamentals based on very low oil and commodity prices, a competitive euro, increased European Central Bank (ECB) stimulus, and more growth-oriented fiscal policies in a number of countries. Disappointingly, Eurozone GDP growth remained limited to 0.3% quarter on quarter (q/q) in the fourth quarter of 2015, after moderating to this level in the third quarter from 0.4% q/q in the second quarter and 0.5% q/q in the first quarter (the best q/q expansion since the first quarter of 2011). Year-on-year (y/y) Eurozone GDP growth edged back to 1.5% in the fourth quarter of 2015 from 1.6% in both the third and second quarters (the best since the second quarter of 2011). Nevertheless, Eurozone GDP growth improved to a four-year high of 1.5% in 2015 from 0.9% in 2014. This followed GDP contractions of 0.4% in 2013 and 0.7% in 2012.





Eurozone GDP growth was likely held back in the fourth quarter of 2015 by a poor net trade performance, as was very much the case in the third quarter. This was certainly true of Germany and France, the Eurozone's two largest economies. German GDP growth was stable at 0.3% q/q in the fourth quarter, while French GDP expansion was also unchanged at 0.3% q/q (underlying French growth was likely slightly stronger in the fourth quarter as it was modestly affected by the November terrorist attacks). Among other Eurozone economies, Italy could only grow 0.1% q/q in the fourth quarter, but there was a modest pickup in Dutch growth to 0.3% q/q. Spain remained very much the star performer among the larger economies, with growth of 0.8% q/q. Meanwhile, Greece just managed to dodge recession; GDP edged up 0.1% q/q in the fourth quarter after contraction of 1.2% q/q in the third quarter as fiscal austerity and capital controls affected growth.

There are still a number of positives for Eurozone growth. Oil prices traded at a more-than-12-year low in mid-January and—despite edging up overall from these lows—are likely to stay muted for an extended period, as are commodity prices. Furthermore, the euro is currently at a level that is very supportive to Eurozone growth, as are bond yields. Ongoing support is also derived from major European Central Bank (ECB) stimulus, which was expanded at its December 2015 meeting. Furthermore, the ECB has indicated that it could further step up its stimulus at its March meeting. Additionally, the fiscal stance across the Eurozone is gradually becoming more growth oriented with increasing fiscal simulative measures being introduced in a number of countries.

Meanwhile, the prospects look relatively decent for consumer spending in the Eurozone. Deflation/low inflation boosts purchasing power, while labour markets have improved appreciably overall (the Eurozone unemployment rate of 10.3% in January is the lowest since August 2011), and there is likely pent-up demand in some countries. However, muted wage growth is a constraint in many countries, while unemployment is still damagingly high in many countries. On the investment front, there should be an increasing need to upgrade and replace old capacity across the Eurozone, given that many companies have delayed doing so for an extended period. Furthermore, credit conditions are easing overall. However, there will likely be little need in most countries to invest to add capacity.

There should also be an overall boost to Eurozone economic activity over both the short (more so in 2016 than was the case in 2015) and long term from the mass immigration that is occurring primarily from the Middle East and North Africa. In the near term, the positive impact on Eurozone growth will largely come from increased consumer and public spending; for example, it is estimated that the average expenditure on each migrant in Germany is EUR12,000 per year. This is likely to add around 0.2 percentage point to German GDP growth in 2016. In the long term, migration should modestly lift Eurozone potential output by boosting working age populations; this could be particularly beneficial for Germany where the demographics are poor.

However, there are numerous uncertainties that will influence just how significant the migrant factor is on Eurozone growth both in the near term and further out. These notably include the actual number of migrants; whether they are integrated well or conversely face hostility from the local population, their skill sets, and the state of the labour markets in which they settle.

However, the Eurozone is clearly not immune to global economic problems, and the current heightened concerns about China and emerging markets clearly pose an appreciable downside risk, along with financial-market weakness and turmoil (reinforced in the Eurozone by increased concerns about the banking sector). There is the very real possibility that slowing growth in China and the emerging markets not only hits Eurozone exports, but also hurts Eurozone business sentiment and leads to a scaling back of investment and employment plans. This risk is reinforced if there is prolonged major financial-market volatility and weakness. The European Commission reported overall Eurozone business and consumer confidence dipped appreciably for a second month, running to be at an eight-month low in February. Additionally, the purchasing managers indicated overall Eurozone manufacturing and services expansion slowed for a second month running in February when it was at a 13-month low.

There are a number of other factors that are also likely to limit the upside for Eurozone growth. Credit conditions currently remain relatively tight in some Eurozone countries despite recent overall improvement. In addition, real interest rates are too high for a number of Eurozone countries. Meanwhile, private and public debt levels remain high in a number of countries. Furthermore, the upside for growth in a number of Eurozone countries continues to be limited by relatively poor competitiveness amid ongoing significant structural problems. There is also the potential for Greek problems to eventually flare up anew.

On balance, we believe that the Eurozone should be able to achieve GDP growth of 1.6% in 2016, improving modestly to 1.8% in 2017. The 2016 projection was trimmed from 1.7% in our February forecast. Furthermore, the risks to these projections are currently slanted to the downside.

The Eurozone experienced renewed deflation in February. Eurostat's flash estimate shows that Eurozone consumer prices fell 0.2% y/y February, marking a return to deflation after four months of mild inflation. The Eurozone has been drifting in and out of deflation since December 2014. In fact, February marked quite a relapse, since consumer price inflation reached an eight-month high of 0.3% in January. While February's relapse back into deflation was partly due to a marked widening in the y/y fall in energy prices after oil prices hit a nearly 12-year low and food-price inflation dropped sharply, the ECB will be particularly concerned to see that core inflation dipped to a 10-month low of 0.7% in February from 1.0% in January. The Eurozone may edge in and out of deflation in the near term before consumer prices gradually edge up because of reduced y/y drops in energy prices helped by base effects, the weak euro, and ongoing Eurozone growth. However, there is clearly a risk that mild Eurozone deflation could prove persistent—particularly if Eurozone economic activity continues to stutter. Furthermore, it will likely be well into 2018 before Eurozone consumer price inflation finally gets back in line with the ECB's target of "close to, but just below 2.0%."

The ECB looks poised to deliver more stimulus in March, having last acted in December. The ECB delivered more stimulus measures at its 3 December policy meeting, aimed at lifting growth and inflation and bolstering inflation expectations. The ECB took its deposit interest rate further into negative territory (from -0.20% to -0.30%) in an attempt to encourage banks to lend more and exert further downward pressure on short-term market interest rates. It maintained its refinancing rate at 0.05%. The ECB also announced that its quantitative easing (QE) program would run to March 2017 or "longer if necessary" instead of September 2016 or longer and indicated it would reinvest principal payments on the securities purchased under QE as they mature. However, the ECB did not step up its monthly spending on asset purchases from the current level of EUR60 billion a month. At its January 2016 meeting, the ECB struck a very dovish tone, indicating that while the December stimuli were

"fully appropriate" at the time, Eurozone inflation had since been weaker than expected and the outlook had deteriorated largely because of the drop in oil prices. Consequently, the ECB would "review and possibly revisit" its monetary policy stance at its March meeting. Since the Eurozone relapsed into deflation in February and given the current heightened downside risks to growth, it now looks probable that the ECB will take its deposit rate modestly further into negative territory. There also has to be a good chance that the ECB will step up its monthly spending on assets from the current level of EUR60 billion, perhaps by a further EUR20–30 billion.

Medium- and Long-Term Outlook

If the Eurozone is to survive in its current form, let alone thrive, over the long term, it has to rectify the fundamental flaw that it is a single-currency area with monetary policy union, but not fiscal or financial union. There is also a need to combat the major imbalances that currently exist within the single currency area as a consequence of the poor competitiveness and productivity of a number of countries, notably including Spain, Italy, Portugal and Greece. While progress has been made in bringing down labour costs and improving the competitiveness of these countries since the Eurozone sovereign debt crisis blew up (especially Spain), much still needs to be done. Furthermore, generally poor demographics across the Eurozone mean that there is a major need for other countries, including France, to undertake structural reforms to support growth and keep their fiscal positions in a sustainable position over the long term. Among the areas that need to be tackled are highly regulated and inefficient labour markets in many countries, costly social security systems, pension reforms, greater liberation of product markets and services, and greater competition.

The IHS central scenario is that policymakers will continue making gradual progress on structural reform, with periodic crises perhaps leading to bouts of accelerated progress. Progress so far on moving toward greater fiscal and banking union in the Eurozone has undeniably been difficult and largely slow overall. Nevertheless, it should be acknowledged that the heightened Eurozone crisis in 2012 led to some important steps being taken, notably including the European Central Bank's Outright Monetary Transactions (OMT) program that was launched in September 2012 as well as the first moves toward banking union.

When it comes to the crunch, there is deep political commitment to the survival of the Eurozone among member countries. This was ultimately evident in the agreement eventually reached in July 2015 to avoid a Greek exit. For example, while Germany has to bear most of the cost of helping the struggling Eurozone countries, it has clearly benefitted overall from the existence of the Eurozone and has a major political interest in a unified Europe. This deep political commitment to the survival of the Eurozone is not always appreciated outside of the single currency area.

If the Eurozone can make these policy adjustments, then it should create a more certain and stable environment that encourages business and investment over the longer term. In addition, the structural reforms that are expected to be enacted should eventually, if gradually, boost the growth potential of countries. Even so, growth in the Eurozone will continue to be constrained by a number of factors, notably the need for extended fiscal constraint to rein in very poor public finances in a number of countries, the need for extended deleveraging of both financial and non-financial sectors in many countries, and poor demographics.

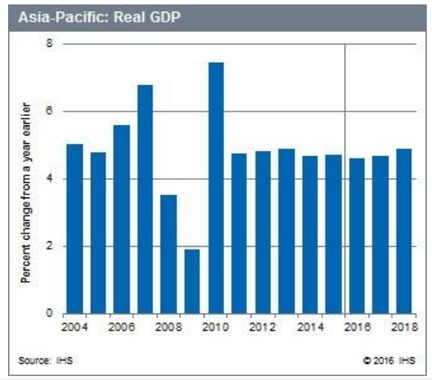
There is also an appreciable likelihood that the deep 2008/09 recession and extendedly very tight credit conditions led to a significant long-term loss of production capacity in the Eurozone, thereby reducing potential growth. Indeed, a European Commission study warned that the Eurozone's potential growth could be damaged by a more heavily regulated environment following the 2008/09 dislocation in financial markets. For example, this could result in reduced availability of capital for research and development and for innovation activities. The study warns "empirical evidence of the effect of past crises shows […] that the economy will not return to its pre-crisis expansion path but will shift to a lower one. In other words, the crisis will entail a permanent loss in the level of potential output."

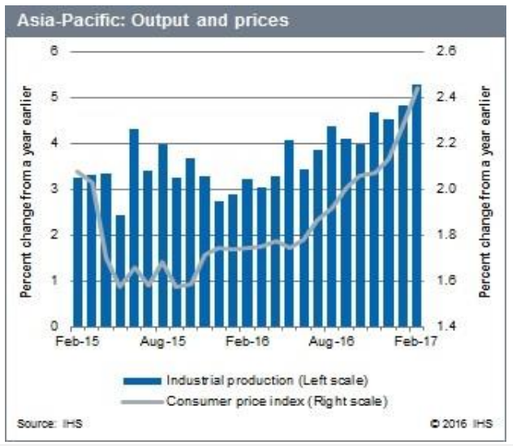
Furthermore, only modest overall and periodically fitful Eurozone growth since the deep 2008/09 recession, including a record six quarters of contraction from the third quarter of 2011 through to the first quarter of 2013, increases the risk of a permanent loss of growth potential. Not only have many forms gone bust, but extended relatively muted demand has limited the inclination of many profitable companies to replace old capacity. Meanwhile, the longer that people remain unemployed, the more their skills are likely to be diluted or even lost. This has adverse repercussions for the labour market pool and productivity. Consequently, it is hard seeing the Eurozone growing by much more than an annual average rate of around 1.5% during 2015–20, even though near-term cyclical prospects have recently improved markedly.

Thereafter, we expect annual average Eurozone growth to moderate to just under 1.5%, largely reflecting deteriorating demographics. This will intensify the need to get labour participation rates up, and we assume that progress will occur in this area, particularly as governments are likely to become less able to subsidize costly social benefit schemes. It is also critical that the region sorts out its immigration and political asylum policies, given the need to deal with the surge of migrants that has occurred since 2015. In the longer term, migration should modestly lift Eurozone potential output by boosting working-age populations; this could be particularly beneficial for Germany, where the demographics are poor. However, there are numerous uncertainties that will influence just how significant the migrant factor is on Eurozone growth both near term and further out. These notably include the actual number of migrants, whether they are integrated well or conversely face hostility from the local population, their skill sets, and the state of the labour markets where they settle.

Asia-Pacific Outlook

Asia's growth continues to downshift. In relative terms, the Asia-Pacific region continues to lead global growth; the region is projected to expand again in 2016, by 4.6%, considerably higher than the world average of 2.6%. The near-term outlook has deteriorated almost across the board and risks to the forecast are skewed on the downside. Growth is projected 0.1 percentage point lower than in 2015, largely slowing across the region alongside the deceleration in the Chinese economy. Japan is a standout among the larger economies, but the expectation there is that consumers will be front-loading consumption spending ahead of the planned 2017 rise in the country's consumption tax. Chinese economic growth is expected to moderate to 6.3% in 2016 from 6.9% in 2015, with softness extending through the medium term. This moderation means China will be less of a growth engine for Asia and the rest of the world in the coming years. This will be particularly true for commodity and energy-intensive sectors because more of China's growth will come from services than from industry and construction. But China is now a source of risk in a more significant fashion. While a slowdown in China had already been a reality for the past couple of years, up until the mid-2015 stock-market correction, it could be argued that much of the Chinese policy agenda had been embracing structural reforms, albeit at a modest pace. That has become less obvious in the aftermath of the command-and-control approach to the stock-market rout. Not only do these non-market responses raise questions about the Chinese leadership's comfort level with true market outcomes in the economy, but their ineffectiveness risks highlighting the leadership's inability to control the final result, thereby undermining its credibility. It is too early to say whether recent events would result in a notable shift toward a more conservative position vis-à-vis the market economy concept, but we believe the risks of such a shift have increased. Meanwhile, in Southeast Asia, ineffectual macroeconomic policies and political scandals sent several currencies to post-Asia-crisis lows in 2015, while external demand floundered. The





mounting threat is that without adequate stimulus or reform, domestic demand in this sub region will suffer, further weighing on growth. Even the news from India, which had been a bit of a brighter spot in Asia since Prime Minister Narendra Modi's election, points to an apparent inability to meaningfully lift growth.

Inflation remains low, allowing for a delay in monetary tightening and, in some cases, renewed stimulus.

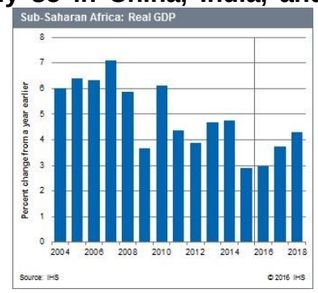
Our regional measure of consumer price inflation has been essentially flat since mid-2015. It is estimated at only 1.7% year on year (y/y) in January 2016, up marginally from the low of 1.6% y/y in July 2015. Excluding Japan, regional inflation is estimated at 2.1% y/y for January 2016. These are extremely low levels of inflation. Although currency depreciation should push imported inflation higher, persistently low global commodity prices and subdued demand will continue to keep a lid on inflation in the near term. As a result, concerns about deteriorating growth prospects will likely take a more central place in monetary policy debates across the region. While many countries have delayed tightening, some, including Japan, India, Indonesia, Taiwan, New Zealand, and Bangladesh, have implemented rate cuts and other liquidity-boosting measures in recent months.

Capital outflows mean Asian currencies remain under threat. One counter-argument to monetary easing is the problem of capital outflows and currency weakness, but the reality is that capital is leaving Asia not merely because of an anticipated less favourable interest-rate differential (in any case, this interest-rate differential would only narrow slightly, not disappear altogether), but rather because the region's growth prospects have fundamentally worsened. A combination of structural reforms and cyclical pro-growth policies may have a better chance of reversing that trend, something on which Indonesia in particular is betting. However, such policy changes take time. In the interim, downward pressure on regional currencies will continue. This isn't necessarily an altogether bad thing, since it would help boost external balances, but it does raise risks of foreign-debt defaults. However, we view these risks to be more relevant in the corporate, as oppose to sovereign, sphere, owing to stronger reserve positions and multiple swap agreements signed since the global financial crisis. These should provide sufficient financing options in an emergency situation.

D.6 Medium- and Long-Term Outlook

Asia's phenomenal growth over the past two decades has been a dual trade and productivity story. Asia's economic performance remains very dependent on exports but domestic sources of growth—particularly private consumption—will play a larger role in coming years. Rapid growth in intraregional exports suggests the emergence of a new regional final market for goods and services, anchored in the previously blistering growth of mainland China and increasingly on growing affluence in other large emerging markets such as India and parts of the Association of Southeast Asian Nations (ASEAN). The Asian Development Bank estimates that export value to mainland China in Korea, Malaysia, Philippines, Singapore, and Thailand increased fivefold over the past 15 years at the expense of the United States and the European Union. Nevertheless, for the time being, intraregional trade remains heavily driven by global production chains' segmentation, and the region remains heavily dependent on advanced markets in the United States, Europe, and Japan as sources of final-stage demand. This dependence has been laid bare by the collapse in global demand in 2008–09, and, to a lesser extent, again in late 2011 and early 2012. Although both businesses and policymakers have undoubtedly noted the vulnerability caused by their extreme export dependence, the way to mitigate that dependence is less than clear. Engineering a shift in the growth model toward more domestically generated growth will take time. While the process unfolds, the region faces the risk of a subpar transitional growth period, most evident at the moment in China.

Asia's manufacturing landscape is undergoing important changes, with both regional and global implications. As China moves up the value-added chain and away from heavy industry, partly by necessity because of rising incomes and labour costs that have eroded its competitiveness in low-cost industries, it will compete more directly with current trading partners within the region and globally for investment and market share. While this presents a risk for countries such as Korea, Japan, Malaysia, and Singapore, given the increasing competition, new opportunities are arising for lower-cost countries such as the smaller South and Southeast Asian economies of Vietnam, Cambodia, Indonesia, India, and others. These countries have the potential to benefit not only from improved market share as China exits some low-end industries, but also from increased investment and outsourcing from the very countries now more directly threatened by Chinese competition. There is compelling evidence that this phenomenon is already taking place, with countries such as Korea and Japan sharply boosting investments into ASEAN in recent years and a strong performance by Vietnam's manufacturing sector during 2015.



A new wave of structural reforms is urgently needed—particularly so in China, India, and Japan—to ensure that the Asian economic miracle continues. Some of the productivity gains that have fuelled Asia's growth in the past are being eroded by a lack of structural reforms in recent years. China's financial system remains highly inefficient, while India's manufacturing ambitions continue to be stifled by a reluctance to fully embrace global trade and face up to the challenges and adjustments that increased competition would bring. For many years, Japan has delayed dealing with its massive debt burden and other challenges. Unless these issues are dealt with, Asia's potential growth will atrophy. IHS remains concerned about the medium-term growth outlook for Asia's major economies owing to the sluggish pace of reforms, especially in China, which will extend the anticipated period of slower growth for the region.

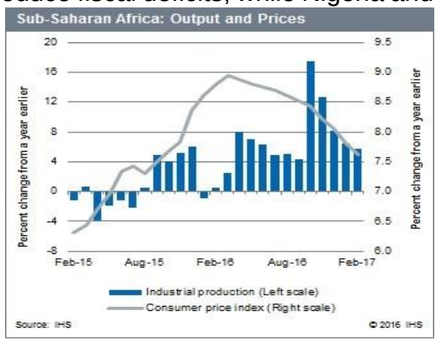
Sub-Saharan Africa Outlook

The Sub-Saharan Africa (SSA) region will experience more moderate growth prospects in light of low global oil and commodity prices. SSA economies have been adjusting to the effects of sharply lower oil and commodity prices and a more lethargic global growth environment. Subsequently, we have cut the region's economic growth outlook during the first quarter of 2016, with real GDP projected to expand by 2.9% in 2016 and 3.7% in 2017. This compares with forecasts of 3.3% and 3.8% for 2016 and 2017, respectively, in our fourth-quarter 2015 release and is markedly lower than SSA's 5.0% average growth rate in the past decade. Our baseline forecasts assume the price of Brent oil averages USD38 per barrel for 2016 and USD49 per barrel in 2017 before tracking up to USD59 per barrel in 2018. Prices for other commodities including metals, minerals, and agricultural products will remain depressed as well. Risks to global growth, which is not expected to breach the 3% mark in 2016, could push commodity prices lower than currently expected and further hamper growth prospects for the SSA region. Greater policy adjustments would be needed for the region's oil and commodity exporters, while oil importers would also face softer external demand. China's economic slowdown leaves the region vulnerable given the country's strong trade and investment links with SSA. Countries have looked to China to partner and help finance investments in the oil and gas industry, rail and road infrastructure, mining, and hydroelectric projects. An expected slower trajectory for China will taper trade flows as demand for commodity-related exports soften, while investment and financing to the continent could ease as well.

The region's key economies are expected to face continued pressure in 2016. Nigeria and South Africa, the two largest economies in the SSA region, are expected to post modest growth in 2016, similar to 2015. Nigeria has struggled to cope with the effects of slumping oil income, leaving economic growth prospects around 2% in 2016, while South Africa's GDP growth is projected to trail down to under 1% in 2016 as both domestic- and external-growth drivers lose steam. Angola and Zambia will see their economic expansions trimmed to just under 3% in 2016, with the Angolan economy unlikely to rebound in 2017, given persistently low oil prices. The spill over of adverse El Niño agricultural sector and electricity supply, which is mostly reliant on hydroelectric power, is expected to dampen Zambia's GDP growth in 2016. In contrast, Ghana's GDP growth should get a lift in 2016 from anticipated commercial production from new offshore oilfields, although projects will remain at risk from the weak global growth environment. The Kenyan economy is expected to expand 6% in 2016 on the back of public infrastructure projects, but adverse global financial-market developments in the year ahead could slow progress on those projects, given Kenya's need for external financing. Other oil- (Cameroon, the Democratic Republic of Congo, Equatorial Guinea, and Gabon) and commodity-dependent economies (Botswana, Namibia, and Zambia) will likely see more moderate growth in the

near term, with elevated risk to the outlook given their commodity dependence. However, pockets of strong growth remain in the region, including Côte d'Ivoire, Ethiopia, Mozambique, and Tanzania.

Fiscal and external balances will remain strained. The commodity-dependent SSA economies are feeling the impact of the weaker prices as export earnings suffer, placing pressure on countries' current-account and foreign-reserve positions. Foreign investment has been less frothy against the weak global economic backdrop, which, taken altogether has exerted downward pressure on exchange rates across the region. On the fiscal side, government revenues rely heavily on income earned off of primary commodities, leaving a deteriorating budgetary position for many countries in the region. The lack of substantial financial buffers has prompted some countries to cut spending, while other countries are facing higher public-debt levels in order to finance the deficit. Among the large economies, Angola and Ghana have taken swift action to reduce fiscal deficits, while Nigeria and South Africa have been slower to implement fiscal consolidation. To mitigate the impact of fiscal adjustment, currencies have been allowed to depreciate, which ultimately will help improve international competitiveness, while monetary policy has in many cases tightened to shield economies against rising inflationary pressures. Looking ahead and faced with tighter liquidity conditions, financing conditions both domestically and externally could prove to be more costly and create further pressure on authorities to curtail spending.



Political and security developments remain a threat to economic activity across sub-Saharan Africa. Regional threats posed by terrorist groups, including the Islamic State, Boko Haram, and al-Qaeda affiliates across the African continent, will continue to jeopardize the regional growth outlook in the year ahead. Cameroon, Chad, Mali, Niger, and Nigeria remain vulnerable to Boko Haram attacks, but other countries also face increasing risks of security threats. The Ebola epidemic also remains a risk in West Africa, with new cases reported in Sierra Leone.

Medium- and Long-Term Outlook

Sub-Saharan Africa's economic outlook will remain closely tied to developments in global commodity markets in the medium and long terms. Sub-Sahara Africa (SSA) has witnessed improvements in its macroeconomic fundamentals in recent years, but the region faces challenges and risks in light of the low global oil and commodity price environment and more moderate global growth outlook over the medium term. With oil and commodity prices expected to remain depressed during the next few years, IHS has revised down SSA's GDP growth to 2.9% in 2016, 3.7% in 2017, and 4.3% in 2018 during the first-quarter forecast round. This compares with the region's 5.0% average growth rate in the last decade. Commodity-price swings have always been a significant factor in the determination of economic growth in the region. Although the share of commodities in world trade has declined, commodities continue to dominate trade in sub-Saharan Africa. Exports of primary commodities average more than 90% of total exports across the region. Nigeria, Ghana, Côte d'Ivoire, the Democratic Republic of Congo, Angola, and Zambia are examples. One way to minimize such dependency in the outer years is to diversify the export base. The chances for such diversification in the short-to-medium term are low, and the downside risk remains high.

Management of mineral resources will be the key to diversification of the economic base and poverty reduction. The region's long-term growth capacity will depend heavily on the degree to which it can leverage its oil wealth in support of nonoil sector development. The track record on this endeavour for oil states is rather poor, but the authorities seem to firmly believe that they will be able to achieve long-term diversification goals. Working in favour of these efforts are the historically strong mining and agricultural sectors as in the case of Nigeria, Zambia, and Angola. Mining-code reform and improved transportation infrastructure, coupled with new investment in value-adding industries such as refining/smelting, could spur growth in this sector. Transportation infrastructure upgrades and public-sector investment will reinvigorate the agricultural sector.

A slowdown in the pace of reform would be a drag on medium-to-long-term growth for sub-Saharan Africa. Many of the countries in the region are fragile democracies, with some leaders only paying lip service to reform. Under this scenario, reform programs that are perceived as anti-people will suffer, and the risk of a rise in economic populism will accelerate, further dampening prospects for growth.

Long-term economic progress will require medium-term political stability. Regional political developments and external issues related to the world economy will also have an impact on long-term GDP growth trends. Political instability, corruption, and economic mismanagement have always been a major constraint on the region's development prospects. Since independence from colonial rule, poverty among the population has increased, nearing 70% in the case of Nigeria, the region's largest economy. With the underlying causes of stagnation still in place in many countries—structural imbalances, poor infrastructure, overdependence on the oil sector, and political instability—economic growth will likely remain below expectations in the outer years unless these problems are properly resolved.

Debt relief will remain a positive factor for the region's growth environment. The external debt burden remains a constraint to poverty reduction in Africa. Continued debt forgiveness in the region will bode well for the growth environment in the medium to long term. Since 2006, the World Bank, the International Monetary Fund, and the African Development Bank have delivered substantial debt relief to a number of African nations under the terms of the Multilateral Debt Relief Initiative (MDRI). The Paris Club of lending nations also announced a deal that saw two-thirds of Nigeria's debt to them written off and the remainder subjected to a buyback arrangement with the country. The benefits that accrue to relief recipients are clearly substantial, if not immediately tangible. Recipient governments are at varying stages of economic development and reform implementation, and the upside to relief may take longer to materialize in some cases. Debt relief does not in itself bridge the gap between Africa's current resources and its long-term needs. The MDRI should simply be seen for what, in fact, it is: another important step forward on the long road to significant real economic expansion in Africa.

E Annexure E: IHS SOUTH AFRICAN ECONOMIC OUTLOOK, MARCH 2016

Key Macro-Economic Indicators

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Real GDP (% change)	2.2	2.2	1.5	1.3	0.5	0.9	2.1	2.3	2.6
Nominal GDP (US$ bil.)	397.7	366.6	350.1	314.2	273.6	295.5	320.2	333.0	342.7
Nominal GDP Per Capita (US$)	7,527	6,863	6,486	5,766	4,977	5,331	5,732	5,917	6,047
Consumer Price Index (% change)	5.7	5.7	6.1	4.6	6.7	5.9	5.3	5.2	4.9
Exchange Rate (LCU/US$, end of period)	8.50	10.49	11.58	15.54	15.55	15.00	15.31	15.84	16.38

Source: *Historical data from selected national and international data sources. All forecasts provided by IHS Global Insight.*

Economic: Country risk statement

Structural constraints, particularly electricity provision and rising unit labour costs, will impede South Africa's economic performance in the short term. The country's rising vulnerability to climate change is stressed by the severe El Niño drought conditions in 2016, giving way to "boom-bust" cycles in the current account, GDP, food prices, and interest rates. International market sentiment turned negative toward South Africa following the irrational and reckless use of political powers by the end of 2015. Political developments will increasingly play a leading role in shaping South Africa's near-term growth performance. To this end, slowing growth and weakening fiscal finances could pave the way for a credit-rating downgrade to "junk status" before end2016. Furthermore, below-trend demand from Europe, coupled with Chinese growth worries will also play a role in risk developments. Adherence to the New Development Plan by government is paramount in improving investor perceptions. Over the medium term, the other structural constraints on the economy include the balance-of-payments restraint, a lack of skilled labour, low labour absorption, other infrastructural shortages, and poor public-service delivery. The balance-of-payments constraint is highlighted by South Africa's low savings propensity. This increases the country's dependence on foreign capital inflows to help finance future investment. The persistent current-account deficit following from a high import propensity is financed primarily with a highly volatile portfolio and other investments. Exports lag on the back of high input costs and capacity constraints. This, alongside the highly traded nature of the rand, increases the country's currency risk.

Short-term outlook

- Near-term growth drivers of the South African economy are coming under increased pressure.
- The rand exchange rate's vulnerability continues.
- The current-account deficit will remain above 4% of GDP.

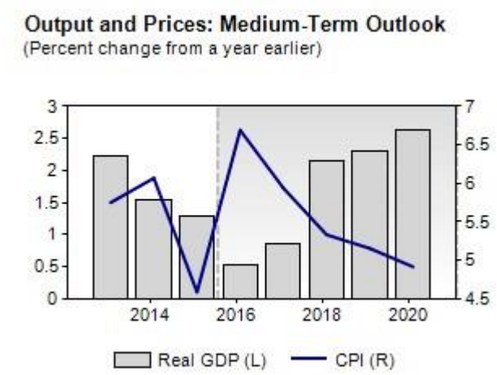
Near-term growth drivers of the South African economy are coming under increased pressure. IHS believes that South Africa's GDP growth rate could trail down to an estimated 0.5% in 2016, edging up only marginally to 0.9% in 2017. Both fiscal and monetary policies have run out of steam to support growth. The policy rate of the South African Reserve Bank (SARB) could increase a further 50–75 basis points in 2016 as headline inflation remains above the SARB's official inflation target range of 3–6% for the most of the year. Rising food prices, the aftermath of the severely dry El Niño weather conditions, the lagged effects of the sharp devaluation of the rand exchange rate, and rising services cost underscores the expectation. Fiscal policy has also moved toward a more restrictive stance through the introduction of new taxes and the increase of some levies, including one on fuel, in the fiscal year 2016/17 national budget. Household spending, now accounting for more than 60% of South Africa's GDP growth is expected to show less resilience during 2016–17. The hike in the policy rate will also leave debt servicing obligations of households up sharply while the low growth environment poses less upbeat expectations for job creation during 2016–17. Policy uncertainty, the low-growth trajectory, and falling business confidence levels will constrain private investment spending during 2016–17. Public-sector investment under the National Development Program will continue, albeit at a slower pace. Import demand may prove resilient as imports of staple products increase during the second half of 2016 to meet domestic and regional food demands. On the external front, IHS has downgraded our global growth expectation for 2016 to 2.6%. Sluggish global demand, particularly for commodity-related exports, combined with domestic structural constraints, of which sufficient electricity supply, lack of business and consumer confidence, and rising unit labour costs are the most pressing, eroded some of South Africa's gains attained in international competitiveness because of the significantly weaker rand exchange rate.

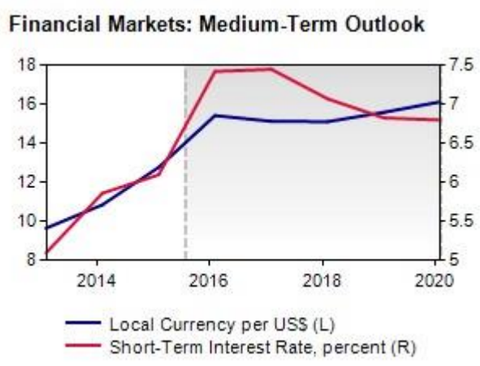
The rand exchange rate's vulnerability continues. Fundamentally, the rand exchange rate should find some support from further gains in international commodity prices, higher domestic interest rates, and US dollar weakness at times. However, negative sentiment—most significantly from the possible downgrade of South Africa to junk status by credit-risk agencies and higher US interest rates—should overrule fundamentals in the coming year. The rand is therefore expected to remain vulnerable during 2016.

The current-account deficit will remain above 4% of GDP. Pressure on the current account will remain high because of the country's high dependency on consumer and investment-related imports as international competitiveness is surrendered because of a rising unit labour cost and escalating input costs such as electricity and other tariffs. Weak international commodity prices combined with structural deficits and a high tendency in labour actions in export-related sectors such as mining will furthermore curtail South Africa's export potential in the near term. Financing of the current-account deficit is dominated by reversible portfolio flows, which has been volatile as quantitative easing in the United States ends and prospects of higher US rates increase. Foreign direct investment (FDI) inflows to South Africa continue to disappoint because of a drop in investor confidence and a low-growth environment. The country's external position will continue to pressure the rand, which should end the year at around ZAR16.45/ USD1.00.

Assumptions

- A stable and coherent political background is expected during the forecast period. Adherence to the New Development Plan is expected, which implies a fair share of private-sector involvement in the economy.
- The government adheres to fiscal austerity over the medium term. The public-sector wage bill is contained and higher taxes are introduced. The labour market stays highly unionized, which complicates the removal of structural impediments to employment creation. South Africa maintains its investment rating.
- The Monetary Policy Committee is successful in maintaining price stability and anchoring inflation expectations within the inflation-containing mandate in the medium term.
- IHS cut the global growth outlook for 2016 on the back of Eurozone and emerging-market growth concerns. Low oil prices are assumed for 2015–16, while domestic food prices start to increase from 2016 onward on the back of severe drought conditions in the 2014/15 and 2015/16 agricultural seasons.
- Positive yield opportunities in South Africa are expected to favour the sufficient inflow of funds to help finance investment, keeping the current-account deficit at a sustainable level over the medium-to-longer term. Further US rate hikes are assumed in 2016.





Key Macro-Economic Indicators

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Real GDP (% change)	2.2	2.2	1.5	1.3	0.5	0.9	2.1	2.3	2.6
Nominal GDP (US$ bil.)	397.7	366.6	350.1	314.2	273.6	295.5	320.2	333.0	342.7
Nominal GDP Per Capita (US$)	7,527	6,863	6,486	5,766	4,977	5,331	5,732	5,917	6,047
Consumer Price Index (% change)	5.7	5.7	6.1	4.6	6.7	5.9	5.3	5.2	4.9
Policy Interest Rate (%)	5.00	5.00	5.75	6.25	7.50	7.50	7.25	7.00	7.00
Fiscal Balance (% of GDP)	-4.4	-3.5	-3.5	-2.6	-3.8	-3.3	-3.2	-3.0	-2.8
Population (mil.)	52.84	53.42	53.97	54.49	54.98	55.44	55.87	56.28	56.67
Unemployment Rate (%)	25.1	25.0	25.3	25.6	26.6	27.5	28.3	28.3	28.8
Current Account Balance (% of GDP)	-4.9	-5.8	-5.4	-4.4	-5.0	-5.3	-4.5	-4.3	-3.4
BOP Exports of Goods US$bn	100.8	96.6	92.5	82.0	75.0	86.5	93.8	108.5	125.6
BOP Imports of Goods US$bn	104.5	103.7	98.9	84.6	78.1	91.1	98.4	112.8	126.8
Exchange Rate (LCU/US$, end of period)	8.50	10.49	11.58	15.54	15.55	15.00	15.31	15.84	16.38

Source: Historical data from selected national and international data sources. All forecasts provided by IHS Global Insight.

Medium- and long-term outlook

South Africa's long-term potential growth rate has been revised down to 3.0–3.5%. South Africa's overall GDP growth has been relatively range bound—between 2.5% and 3.5%—since the end of the international commodity super cycle. The country grapples with structural constraints, of which sufficient electricity supply and an inflexible labour market are the most prominent. Consumer spending, the biggest growth driver of the South African economy, remains restricted by high levels of unemployment and debt-to-income ratios of households, while price increases in the economy remain sticky above 5%. In recent years, state inefficiency and corruption under the Zuma administration have escalated, which pushed up the cost of doing business and also places a larger burden on state finances. The ending of the commodity price boom, lacklustre global growth, disruptive labour actions, and rising wage costs have placed more pressure on South Africa's mining and manufacturing sectors, which notoriously have been large contributors to export earnings. South Africa's high import propensity for intermediate and investment-related goods and loss in competitiveness has left the current account more vulnerable. The financing of the current-account deficit remains dominated by highly liquid short-term portfolio flows and international borrowing. The lower growth profile bodes less positive for long-term foreign investment inflows.

Nonetheless, South Africa still remains one of the most developed economies in the sub-Saharan region. The country's solid monetary policy is safeguarded by the independence of the South African Reserve Bank (SARB) and the strong anchor of the inflation-targeting regime and a flexible exchange rate to cushion the country against external shocks. IHS assumes headline inflation to remain within the SARB's inflation target range of 3–6% over the long term. Upside pressure from administrative prices and possible rand weakness will pose a risk to the inflation outcome. South Africa's tax collection systems rank among the best in the world. The same applies for the highly developed and well-regulated financial system, which includes the Johannesburg Stock Exchange (JSE). Although infrastructure bottlenecks have become apparent in recent years, the country's road, rail, and port facilities are the best developed in the region. The judicial system remains solid and the skills pool diversified, while high-ranked tertiary institutions position South Africa well to reap the benefits of the regional economic strength foreseen in coming years.

The government's pursuit of higher growth manifests itself in infrastructural spending priorities and employment creation. The government remains focused on lowering unemployment and accelerating growth. In this regard, a substantial part of the budget is allocated to infrastructure plans during the medium term, while the government's economic growth centres on job creation and targets a reduction in the unemployment rate from the current 25% to 15% by 2020. This target is to be achieved in full partnership with the private sector, accompanied by heightened infrastructural spending. Certain sectors will be targeted to grow the economy at a faster rate to absorb more of the unemployed and develop a stronger manufacturing base. These include an intense infrastructure expansion in transport, water, energy, communication, and housing, as well as a focus on agriculture, mining, the green economy, and tourism. The success of the implementation of the action plan nevertheless hinges critically on the government's ability to deliver. Service delivery is still a crippling issue in South Africa. Additional concern centres on the availability of government funds to facilitate many of the above-mentioned cornerstones in light of the critical need to keep the fiscal deficit under control.

The economic challenges facing the country include its ability to sustain economic growth in volatile global markets, broaden participation, strengthen industrial development and trade performance, and accelerate the pace of job creation. Skill and capacity shortages, high input costs, bad service delivery, and an unfriendly regulatory environment remain among the main domestic constraints on growth. Key questions stemming from the global economy that could add to risks facing the South African economy include developments in global liquidity, commodity prices (including oil), and emerging-market sentiment.

Growth

GDP

South Africa's near-term growth prospects have been revised down even further, with growth projected at 0.5% for 2016. IHS has lowered South Africa's real GDP growth forecast for 2016 even further to an average of 0.5% for the year, ticking up to around 0.9% in 2017. The impact of the weather phenomenon El Niño on the country's agricultural sector and overall GDP growth will be more severe than previously anticipated.

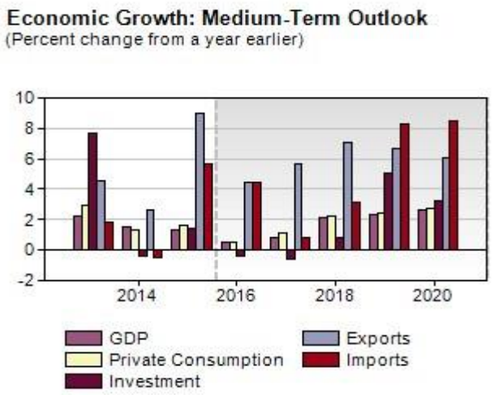
The dry El Niño weather conditions spill over effect is sizeable for the South African economy. South Africa's agricultural sector is technically in recession, with latest numbers showing the sector contracting 8.3% year on year already during 2015. Although the sector accounts for roughly 2% of real GDP, the impact of dry El Niño weather conditions will have a sizeable effect on South Africa's overall economy through a substantial increase in staple food importation (estimates now point to a demand of 6 million tons of imported maize), weakening household income levels as food prices and

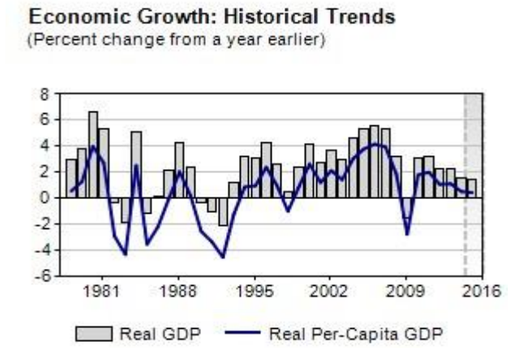
interest-rate hikes accelerate, and insufficient water supply that will have second-round damage on agricultural production since the sector accounts for roughly 60% of South Africa's total water use.

Structural constraints and global growth drivers are also expected to be growth restrictive during 2016. The South African rand has lost more than 25% of its value on average against the US dollar in 2015. The subsequent improvement in South Africa's international competitiveness should support the economy's exporting sectors. However, IHS has lowered global growth prospects below the 3.0% threshold and now expects growth to average 2.6% in 2016. Sluggish global demand, particularly for commodity-related exports, combined with domestic structural constraints—of which sufficient electricity supply, lack of business and consumer confidence, and rising unit labour costs are the most pressing—eroded some of South Africa's gains attained in international competitiveness. A strong rebound in exports is therefore not foreseen. South Africa's fixed investment environment will also remain dismal. Policy uncertainty, rising interest rates, low-growth trajectory, and falling confidence levels will further constrain private investment spending during 2015–16. Public-sector investment under the National Development Program will continue, albeit at a slower pace because of public-sector funding constraints.

Consumption expenditure, the primary growth driver of the economy, may lose momentum in the near term. Household spending in the South African economy may also show less resilience in the near term. Rising inflation, the net impact of higher domestic food prices, increased services cost (electricity tariffs), and the feed-through of the weaker rand exchange rate will erode real disposable income levels in the near term. Furthermore, the consumer market will grapple with a high unemployment rate, a high household debt-to-income overhang, and prospects of rising interest and tax rates during 2016. IHS forecasts consumer spending will trail down to an estimated 0.6% in 2016 from 1.6% in 2015. Currently, consumer spending constitutes more than 60% of GDP. In the long term, consumer spending is expected to grow substantially on the back of rising population growth, steady employment, and real wage growth.

Fiscal and monetary policies are at the mercy of the low-growth trajectory. The persistent deterioration in South Africa's near-term growth prospects is problematic for the country's fiscal and monetary policies. The February 2016 national budget makes provision of a larger effective tax burden in the South African economy by hiking the domestic fuel levy and introducing new tire and sugar taxes. The low-growth environment leaves fiscal income projections subject to a large degree of downside risk, while slow policy implementation may leave state-owned enterprises (SOE) reliant on treasury support the coming fiscal year despite a drive of more public-private initiatives. This will push up South Africa's overall debt burden. In the view of IHS, South Africa will find it difficult to avert a further credit-risk rating downgrade in the medium term. The low-growth environment also discouraged the South African Reserve Bank (SARB) to hike interest rates too aggressively in an attempt to shield the economy against a consumer slump during 2015. However, the expansionary budget policy in recent years, slow interest-rate hikes combined with mounting pressure on the current account, and financial flows could cost South Africa dearly because an aggressive policy response, which will seriously jeopardize growth, could materialize down the line.





Economic Growth Indicators

	2013	2014	2015	2016	2017	2018	2019	2020
Real GDP (% change)	2.2	1.5	1.3	0.5	0.9	2.1	2.3	2.6
Real Consumer Spending (% change)	2.9	1.4	1.6	0.5	1.1	2.2	2.4	2.7
Real Government Consumption (% change)	3.3	1.9	0.3	0.0	1.9	2.0	1.8	2.6
Real Fixed Capital Formation (% change)	7.6	-0.4	1.4	-0.4	-0.5	0.9	5.1	3.3
Real Exports of Goods and Services (% change)	4.6	2.6	9.0	4.4	5.7	7.1	6.7	6.1
Real Imports of Goods and Services (% change)	1.8	-0.5	5.7	4.5	0.8	3.1	8.2	8.4
Nominal GDP (US$ bil.)	366.6	350.1	314.2	273.6	295.5	320.2	333.0	342.7
Nominal GDP Per Capita (US$)	6,863	6,486	5,766	4,977	5,331	5,732	5,917	6,047

Source: Historical data from selected national and international data sources. All forecasts provided by IHS Global Insight.

Consumer demand

Consumer spending in the South African economy may be less resilient in 2016. Annual growth in real disposable income per capita, a key driver of household spending growth in the South African economy, is expected to ease back during 2016 as average prices and interest and tax rates move up in the economy. At the same time, wage increases could converge closer to headline inflation rates as average corporate earnings growth trails lower.

Risks to the consumer spending outlook continue to be tilted toward the downside, and spending is unlikely to reach historical highs. The volatile South African rand and possible food-price increases are the biggest risks to consumer spending in the near term. Upward pressure from a weaker currency could erode any small gains in households' real income levels as higher inflation filters through, while severe drought conditions in primary food-producing areas have lifted domestic food prices for key commodities. Although the ratio of household debt to disposable income has been coming down, it

remains around 77.8%, with debt-servicing obligations around 9.7% of household income. Employment conditions in the economy are unlikely to improve significantly. The public sector, a key job provider in recent years, will show little upward momentum as the government moves toward some fiscal consolidation. Strict lending rules from the 2007 Credit Act add to this expectation, leaving asset-backed lending slow. The BankservAfrica Economic Transaction Index (BETI), contracted during December–January on a monthly basis, while the annual growth rate trended to nearly zero during the period, highlighting the fragile backdrop for the South African consumer. The March BETI reading failed to repeat its resilience recorded in February and edged up only by 0.4% during March from 2.2% in February. Total real retail sales during the first quarter are unlikely to breach the 4% growth threshold witnessed in the past few years. The pace and extent of monetary tightening will be paramount in ensuring sustainable consumption. In the longer term, growth in household consumption should revert to levels of around 3.0% per year, in line with expected employment growth of about 0.5–1.0% per year and productivity-related real wage increases of around 2.5% per year. The consumption expenditure share of GDP, at close to 60%, underscores the importance of this sector to sustain growth through the medium term.

Capital investment

Fixed investment spending in South Africa is unlikely to rebound during 2016. South Africa is facing mounting structural constraints, weak growth prospects, and a worsening business policy environment. Low consumer confidence, combined with strict lending criteria by commercial banks and higher personal tax rates, poses little emphasis for a sustainable residential sector recovery. Non-residential private investment is expected to be impeded by substantial domestic electricity shortages over the next two years and a weak growth backdrop both domestically and internationally. The manufacturing sector has witnessed an ongoing drawback in capacity utilization and the sequential need for investment. The manufacturing and mining sectors face other binding issues owing to uncoordinated macroeconomic and microeconomic policies. Electricity tariff increases of more than double the South African Reserve Bank's inflation target and a possible carbon tax will increase the cost of doing business, while a highly unionized labour force increases overall unit labour cost in the sectors. Product diversification is also essential to ensure the expansion of the manufacturing sector in the medium-to-longer term. Some additional concerns centre on the low level of domestic savings as a source of funds for future investment growth, labour-market unrest, and mixed policy signals from the government, which is leading to a postponement of much-needed private-sector investment.

The South African government pledges ZAR847 billion (USD81 billion) under the New Development Program (NDP). Infrastructure projects include power plant construction, transport network expansion and upgrades, and the provision of new sanitation and water infrastructure. For fiscal years 2015–18, well into the NDP implementation period, the national budget makes provision for investment spending of ZAR800 million. This spending should eventually crowd in private-sector investment, especially as the government prioritizes domestic procurement. Budget constraints and delays in implementation remain a concern.

Labour markets

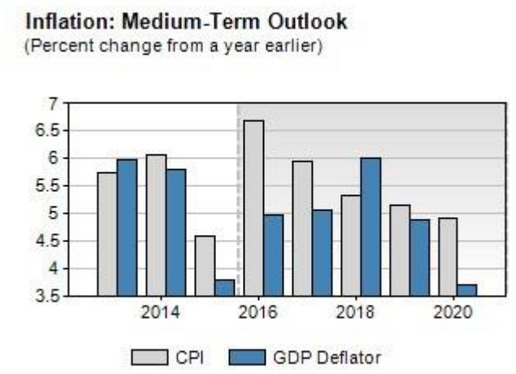
South Africa continues to struggle with a structurally high unemployment rate of more than 20% (registering 24.5% in the fourth quarter of 2015). Deeply rooted structural problems (including rigid labour laws, high real wages, a highly unionized workforce, and a lack of appropriate skills) have kept unemployment high, despite stronger economic growth in the pre-2009recession years. Economic growth has not been particularly labour-absorbing because of the structural shift in employment creation away from the primary sectors toward the services sector. This is unsurprising, given the services-sector dominance in the economy and the fact that economic growth in the prerecession years was driven mainly by consumer spending. It is estimated that the labour force grows annually by between 500,000 and 700,000 job seekers. During the five-year period before the recession of 2009, however, the economy was only able to create around 460,000 jobs per year, which clouds prospects for employment creation in the current slow growth environment.

According to the IHS South African macro econometric model, the employment elasticity with respect to GDP growth is estimated to be below unity. This means that for every 1% increase in economic growth, private-sector employment increases only half a percentage point (0.51%). Model estimates show that an economic growth rate of 4.5–5.0% year on year (y/y) by 2020 will create only enough jobs to lower the unemployment rate to just below 20.0%. This is a far cry from the medium-term growth IHS expects and the 15% unemployment rate targeted by the government. In essence, the government's goal of halving unemployment over the next 10 years is going to remain close to impossible if labour absorption is not increased dramatically. Nevertheless, the government has prioritized employment creation and, as part of its growth plan, will also support the manufacturing sector, which is seen as the engine of growth. Such measures include attempting to lower entry-level wages, a youth subsidy providing employment for young people, company initiatives to launch labour-creating projects, emphasizing the need to align wage growth with productivity growth, and boosting mining-beneficiation and regional integration. Nevertheless, the highly unionized nature of the South African labour market, which leads to annual disruptions in the economy because of strikes and work stoppages, coupled with inflexible regulations, complicates the introduction of productivity-enhancing measures as well as lower annual wage increases.

Inflation

South Africa's headline inflation rate will breach the 3–6% target range during 2016. The pass-through of the weaker rand exchange rate, rising drought-induced food prices, and increased tariffs are expected to leave headline inflation above the central bank's target range of 3–6% in 2016.

Medium-term price pressures in South Africa remain high. South Africa's headline inflation rate is expected to remain above the upper-end of the South African Reserve Bank's inflation target range of 3–6% for the most of 2016–17. Major inflation drivers turned for the worst at the onset of 2016. Food-price inflation is estimated to accelerate to around 11% by year-end because of the impact of the severe drought conditions witnessed over the 2015/16 agricultural season; the lagged impact of the steep depreciation in the rand/exchange rate combined with rising services cost, particularly electricity, add to the inflation woes. The effects of higher taxes—particularly a tire tax and sugar tax—combined with unit labour cost should not be weighted lightly in the inflation outlook in the medium term. South Africa's output gap is still positive and is expected to remain in positive territory during 2016, resulting in limited demand-price pressures in the economy. Latest estimates by the South African Reserve Bank place South Africa's potential GDP growth at 1.5–1.8% owing to structural bottlenecks.



Inflation Indicators

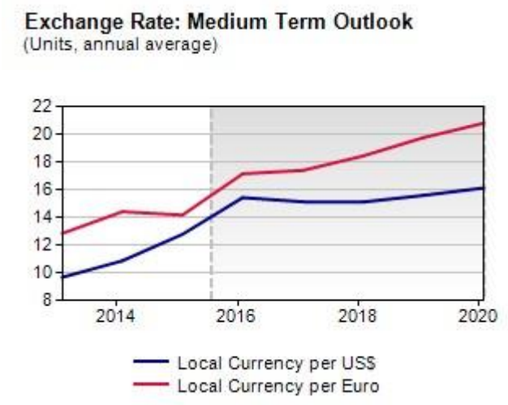
	2013	2014	2015	2016	2017	2018	2019	2020
Consumer Price Index (% change)	5.7	6.1	4.6	6.7	5.9	5.3	5.2	4.9
Wholesale-Producer Price Index (% change)	6.0	7.4	3.6	6.4	6.3	7.4	6.8	5.1

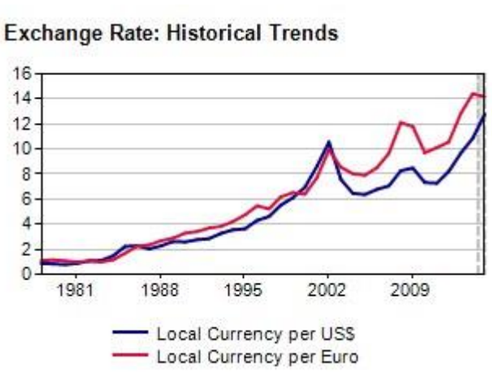
Source: *Historical data from selected national and international data sources. All forecasts provided by IHS Global Insight.*

Exchange rates

Investor sentiment and higher US rates will drive short- and medium-term trends in the currency. The South African rand lost close to 20% of its value against the greenback in 2015. On a trade-weighted basis, the nominal effective exchange rate fell 5.5% during 2015, with the rate of depreciation gaining momentum in the second half of 2015. The currency remains at the mercy of market sentiment. Some gains in international commodity prices, a significantly weaker US dollar, and some positive emerging-market sentiment propped up the rand back to fourth-quarter 2015 levels of ZAR14.20/USD1.00 in April. This followed a volatile rand run since the start of 2016, with the rand breaching the ZAR16.00/USD1.00 level at times. Fundamentally, the rand should find some support from further gains in international commodity prices, higher domestic interest rates, and periodic US dollar weakness. However, negative sentiment—most significantly from the possible downgrade of South Africa to junk status by credit-risk agencies and higher US interest rates—should overrule fundamentals in the coming year. The rand is therefore expected to remain vulnerable in 2016.

Over the longer term, price differentials with the rest of the world, movements in commodity prices, and the stance of the current-account deficit, coupled with the level of international reserves, will determine the level of the rand. South Africa has a high import propensity, which, along with slow-developing export markets, is expected to keep the external accounts in the red, leading to downward pressure on the rand. Furthermore, inflation in South Africa is expected to stay at around 5.0–5.5% over the longer term, with global inflation at around 2.0–2.5%. This leaves an inflation differential of around 3%, which is also the rate at which the rand is expected to depreciate over the longer term. Upside pressures on the rand, which are expected to cushion the longer-term depreciating bias of the currency, include South Africa's steady accumulation of reserves, underpinning foreign-investor interest and upward trending commodity prices as global growth gradually increases.





Exchange Rate Indicators

	2013	2014	2015	2016	2017	2018	2019	2020
Exchange Rate (LCU/US$, end of period)	10.49	11.58	15.54	15.55	15.00	15.31	15.84	16.38
Exchange Rate (LCU/US$, period avg)	9.65	10.85	12.76	15.40	15.11	15.09	15.57	16.10
Exchange Rate (LCU/Euro, end of period)	14.47	14.06	16.92	17.42	17.70	19.14	20.27	21.29
Exchange Rate (LCU/Euro, period avg)	12.82	14.39	14.15	17.12	17.37	18.42	19.73	20.78

Source: Historical data from selected national and international data sources. All forecasts provided by IHS Global Insight.

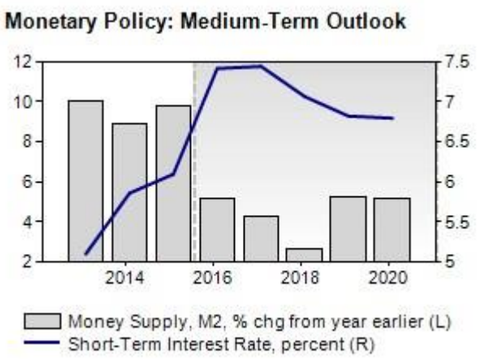
Currency: Foreign exchange and profit repatriation risks

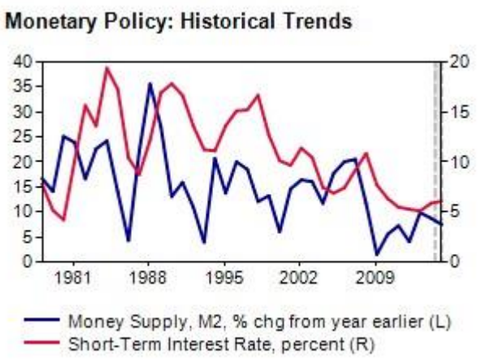
The South African rand exchange rate came under renewed pressure, and the highly traded currency tracked most other emerging-market currencies downward against the stronger US dollar and rising negative emerging-market sentiment during 2015. The currency will remain vulnerable as US interest-rate developments unfold and uncertainty over a possible South African credit-risk downgrade increases. The South African current-account deficit continues to be financed by short-term portfolio flows and other direct investment (such as foreign loans to the domestic commercial banking sector), directing to the currency's depreciation/appreciation bias, vulnerability, and sensitivity to emerging-market sentiment. Direct foreign investment currently accounts for less than 20% of the current-account financing needs. Import demand will increase owing to the country's high import propensity for intermediate and investment goods. Food importation owing to severe drought conditions in some of the country's major food-producing areas will keep imports resilient. Exports should pick up, but lacklustre growth in major trading partners such as the European Union and China combined with electricity shortages will keep growth muted. Production disruptions owing to labour unrest in key exporting sectors such as mining remain high. Rand volatility is expected for the remainder of the year, with bouts of softness dictated by US dollar strength. Overall, IHS expects the currency to end at around ZAR16.45/USD1 by end-2016.

South Africa has a freely floating exchange-rate regime, which does not impede conversion and transfer of funds by foreigners or foreign entities. The central bank, the Reserve Bank of South Africa, is an independent institution and is charged with maintaining price stability. The governor of the Reserve Bank, Lesetja Kganyago, has indicated the bank will remain committed to its policy of inflation targeting despite pressure from trade unionists to consider nationalizing the institution and expanding its mandate to include job creation and economic growth. South Africa has accepted the obligations of the International Monetary Fund (IMF)'s Article VIII (on avoidance of discriminatory currency practices and payment restrictions). Under the Currencies and Exchanges Act, there are no limitations on dividends or on the repatriation of capital by foreign businesses and non-residents. These freedoms are meant to encourage inward capital. However, royalty and technology transfer arrangements with regards to offshore manufacturing, as well as payments of management and technical fees and repayments of interest on foreign loans, are subject to exchange control authorization. A downgrade in South Africa's credit-risk rating to noninvestment status could, however, exert unprecedented pressure on South Africa's foreign-reserve holdings because of a reversal in portfolio flows, with capital controls being a possible policy response in the view of IHS.

Monetary policy

The South African Reserve Bank's monetary policy aims to contain inflation, as measured by headline consumer prices, within the official inflation target range of 3–6% in the medium term. The monetary policy stance of the South African Reserve Bank is influenced by movements in the currency, international oil- and food-price movements, and underlying inflation trends dictated by labour market demands and company pricing, combined with inflation expectations. A longer-term upward bias to inflation is expected following the currency's depreciating trend on the back of continued current-account deficits. Food prices are expected to stay above trend during the long term on the back of an increasing global food demand. Continued above-inflation increases in electricity prices and wages in South Africa furthermore restrict inflation's downward movement. The latter is subject to a high level of unionization of the labour market, inflexible labour-market rules, and a shortage of skilled labour. The risk of higher food prices and a weaker rand exchange rate—particularly in the run-up to some further US interest rate tightening in 2016 and a possible downgrade of South Africa's investment rating by Standard & Poor's—combined with double-digit increases in tariffs such as electricity are expected to push inflation above the target range during 2016– 17. As a result, we assume a further 50–75-basis-point increase in the central bank's policy rate during 2016–17. Sluggish domestic demand growth and delays in US monetary tightening pose some risk to the interest-rate outlook.





Monetary Policy Indicators

	2013	2014	2015	2016	2017	2018	2019	2020
Policy Interest Rate (%, end of period)	5.00	5.75	6.25	7.50	7.50	7.25	7.00	7.00
Short-term Interest Rate (%, end of period)	5.10	5.86	6.10	7.41	7.44	7.06	6.82	6.79
Long-term Interest Rate (%, end of period)	7.72	8.25	8.17	9.55	9.09	8.41	8.31	8.33
M2 Money Supply (US$, end of period)	210.2	203.7	190.2	165.6	176.1	180.9	184.5	187.7

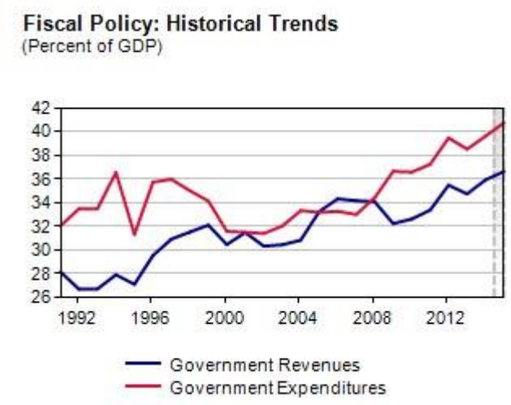
Source: Historical data from selected national and international data sources. All forecasts provided by IHS Global Insight.

Fiscal policy

Fiscal prudence is upheld in the 2016/17 budget proposal. The 2016/17 national budget remains committed to prudent fiscal policies through ongoing reductions in the budget deficit target below 3% of GDP in the medium term. In an effort to rein in government debt, finance minister Pravin Gordhan raised the effective tax rate by hiking domestic fuel levies a further ZAR0.30/litre, introducing two new taxes—a tire tax and sugar tax—and increasing transfer duties on high-end properties and the capital gains tax. On the expenditure side, the government remains committed to public-sector investment, prioritizing road, water, and port facilities. The budget provides for an additional ZAR16 billion in higher education spending in the next three years, following the "Fees must Fall" uproar in 2015, while an additional ZAR11.5 billion in social grants will be paid out over the period. South Africa's agricultural sector will receive an additional ZAR15 billion for land acquisition, farm improvements, expanding agro-processing opportunities, and drought support. The public-sector wage bill also came under scrutiny and will be cut in the next three years through voluntary resignations and employee attrition. The fastest-growing item of consolidated expenditure remains interest payments, increasing at an annual average of 11%.

State-owned enterprises (SOEs) will receive less financial support from the government as public-private initiatives (PPIs) are pursued. The finance minister also announced a broader participation of the private sector in SOEs through public-private initiatives (PPI). Consolidation is proposed, such as merging South African Airways (SAA) and SA Express, while “irrelevant” SOEs will be phased out. Financing needs of remaining SOEs will be met through these cost-saving measures and PPI support.

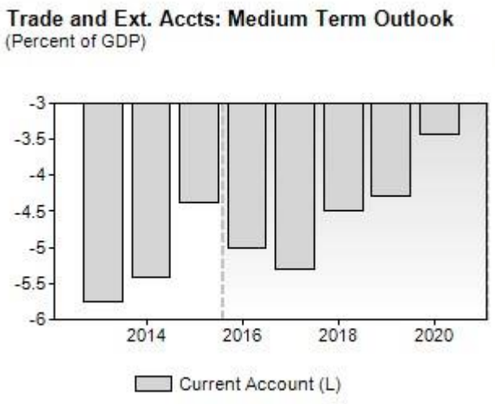
The low-growth environment and slow policy implementation remain constraints to achieving budget targets. Revenue underperformance appears likely, especially over the medium term. Furthermore, voluntary resignations and staff attrition of public-sector workers could be slower than anticipated, especially in an adverse job market, ensuring a larger-than-projected public-sector wage bill. A sharp rise in inflation could also push the public-sector wage bill higher since salary adjustments are linked to inflation plus 1% in the medium term. Little detail on private-sector participation in SOEs, combined with a lack of willingness to surrender majority shareholding, could also be a disincentive for investors. The ongoing financing of inefficient SOEs could exceed expectations in the medium term.

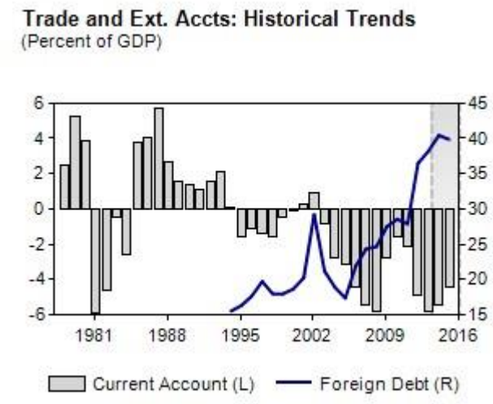


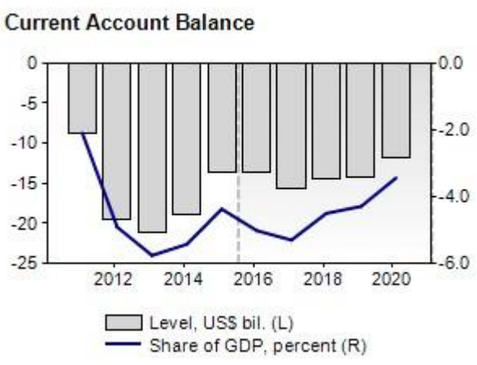
External sector

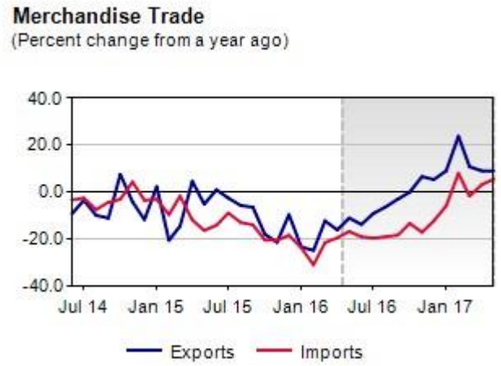
The current-account deficit is expected to remain under pressure. The high import propensity for consumer and investment-related goods due to an ongoing loss in international competitiveness and structural bottlenecks dominated by an inefficient electricity supply and rising unit labour costs could leave import demand strong over the medium term. Furthermore, export proceeds will be hamstringed by low international commodity prices and sluggish global demand, particularly for some of South Africa’s major trading partners, including China and the European Union. The current-account deficit has found some respite thanks to low international oil prices; however, the simultaneous price fall in South Africa’s largest export commodities meant the country’s terms of trade grew just 1.2% during 2014 and contracted 0.7% in 2015. Overall, IHS expects the current-account deficit to average more than 5% of GDP during 2016–17.

South Africa stays highly dependent on volatile foreign-portfolio flows to finance its external imbalances. Domestic savings are extremely low and are not forecast to improve significantly because of a low savings propensity in the South African economy. Although capital inflows in recent years have been more than sufficient to cover the current-account shortfall, the nature of capital flow, namely the short-term portfolio, remains problematic and highly dependent on global risk perceptions. The country's low international debt and current credit record, along with the flexible exchange rate and prudent monetary policy regime, will certainly ensure accessibility to international funding facilities, should a financial crisis occur.









Trade and External Accounts Indicators

	2013	2014	2015	2016	2017	2018	2019	2020
Exports of Goods (US$ bil.)	96.6	92.5	82.0	75.0	86.5	93.8	108.5	125.6
Imports of Goods (US$ bil.)	103.7	98.9	84.6	78.1	91.1	98.4	112.8	126.8
Trade Balance (US$ bil.)	-7.1	-6.3	-2.7	-3.1	-4.6	-4.7	-4.3	-1.2
Trade Balance (% of GDP)	-1.9	-1.8	-0.8	-1.1	-1.6	-1.5	-1.3	-0.3
Current Account Balance (US$ bil.)	-21.1	-19.0	-13.7	-13.7	-15.7	-14.4	-14.3	-11.8
Current Account Balance (% of GDP)	-5.8	-5.4	-4.4	-5.0	-5.3	-4.5	-4.3	-3.4

Source: Historical data from selected national and international data sources. All forecasts provided by IHS Global Insight.

Key indicators and forecasts

Detailed Macro-Economic Indicators	2012	2013	2014	2015	2016	2017	2018	2019	2020
Real GDP (% change)	2.2	2.2	1.5	1.3	0.5	0.9	2.1	2.3	2.6
Nominal GDP (US$ bil.)	397.7	366.6	350.1	314.2	273.6	295.5	320.2	333.0	342.7
Nominal GDP Per Capita (US$)	7,527	6,863	6,486	5,766	4,977	5,331	5,732	5,917	6,047
Nominal GDP Per Capita (PPP$)	12,670	13,026	13,291	13,524	13,599	13,880	14,367	14,907	15,528
Real Consumer Spending (% change)	3.4	2.9	1.4	1.6	0.5	1.1	2.2	2.4	2.7
Real Fixed Capital Formation (% change)	3.6	7.6	-0.4	1.4	-0.4	-0.5	0.9	5.1	3.3
Real Government Consumption (% change)	3.4	3.3	1.9	0.3	0.0	1.9	2.0	1.8	2.6
Real Imports of Goods and Services (% change)	6.0	1.8	-0.5	5.7	4.5	0.8	3.1	8.2	8.4
Real Exports of Goods and Services (% change)	0.1	4.6	2.6	9.0	4.4	5.7	7.1	6.7	6.1
Industrial Production Index (% change)	2.0	1.5	0.1	-0.1	0.3	1.1	2.1	2.5	3.9
Consumer Price Index (% change)	5.7	5.7	6.1	4.6	6.7	5.9	5.3	5.2	4.9
Wholesale-Producer Price Index (% change)	7.0	6.0	7.4	3.6	6.4	6.3	7.4	6.8	5.1
Policy Interest Rate (%)	5.00	5.00	5.75	6.25	7.50	7.50	7.25	7.00	7.00
Short-term Interest Rate (%)	5.27	5.10	5.86	6.10	7.41	7.44	7.06	6.82	6.79
Long-term Interest Rate (%)	7.90	7.72	8.25	8.17	9.55	9.09	8.41	8.31	8.33
Fiscal Balance (% of GDP)	-4.4	-3.5	-3.5	-2.6	-3.8	-3.3	-3.2	-3.0	-2.8
Population (mil.)	52.84	53.42	53.97	54.49	54.98	55.44	55.87	56.28	56.67
Population (% change)	1.1	1.1	1.0	1.0	0.9	0.8	0.8	0.7	0.7
Unemployment Rate (%)	25.1	25.0	25.3	25.7	26.5	27.3	28.0	28.0	28.5
Current Account Balance (US$ bil.)	-19.5	-21.1	-19.0	-13.7	-13.7	-15.7	-14.4	-14.3	-11.8
Current Account Balance (% of GDP)	-4.9	-5.8	-5.4	-4.4	-5.0	-5.3	-4.5	-4.3	-3.4
Trade Balance (US$ bil.)	-3.7	-7.1	-6.3	-2.7	-3.1	-4.6	-4.7	-4.3	-1.2
Trade Balance (% of GDP)	-0.9	-1.9	-1.8	-0.8	-1.1	-1.6	-1.5	-1.3	-0.3
BOP Exports of Goods US$bn	100.8	96.6	92.5	82.0	75.0	86.5	93.8	108.5	125.6
BOP Imports of Goods US$bn	104.5	103.7	98.9	84.6	78.1	91.1	98.4	112.8	126.8
Exchange Rate (LCU/US$, end of period)	8.50	10.49	11.58	15.54	15.55	15.00	15.31	15.84	16.38
Exchange Rate (LCU/Yen, end of period)	0.10	0.10	0.10	0.13	0.14	0.13	0.13	0.14	0.14
Exchange Rate (LCU/Euro, end of period)	11.22	14.47	14.06	16.92	17.42	17.70	19.14	20.27	21.29

Source: Historical data from selected national and international data sources. All forecasts provided by IHS Global Insight.

Background: Economic development

South Africa has by far the biggest, most developed economy in Africa and is often referred to as the engine of growth for the rest of Africa. The services, mining, and manufacturing sectors make a significant contribution to the country's economy. With a GDP per capita of around USD8,064 (in 2011 terms) per year, South Africa ranks alongside other middle-income countries, such as Chile, Mexico, Hungary, Thailand, and Malaysia. Along with Egypt, South Africa is the only other country on the continent that has emerging market status. During 1960–80, the income per capita increased rapidly, but suffered a sharp reversal thereafter as economic sanctions, in reaction to policies implemented by the then so-called apartheid government in the 1980s, took effect. Since the end of apartheid rule in 1994 the overall economic performance improved, with the economy growing at an

average annual rate of close to 4% between 1995 and 2008 before slowing in the subsequent two years as the global recession set in. Nevertheless, even the pre-recession growth was still far below the performance of other emerging markets among which South Africa finds itself.

When the ANC-led government came to power in 1994, its main macroeconomic strategy was focused around the Growth, Employment and Redistribution (GEAR) program. This included financial and fiscal discipline, aims for economic growth, job creation, and the development and distribution of basic services to all South Africans. The principles contained in GEAR are still largely adhered to, but there have been some broad changes made to some of the GEAR elements and targets in recent years. In a policy discussion paper released in June 2007, the

African National Congress outlined their view on future economic development in South Africa. They reiterated that they were committed to the transformation of the economy to realize the "Freedom Charter's vision of the society in which the people shall share in the country's wealth." The government's approach to economic transformation will be dominated by the understanding that economic changes will not emerge spontaneously from the market but need active strategic intervention from the state. This is described as a developmental state and encompasses continued ownership of entities in the energy and national transport sectors as well as acting as a catalyst towards the broader development of the economy. The private sector is, however, expected to play an active and integral role in the economy.

The Accelerated and Shared Growth Initiative for South Africa, introduced in 2005, aimed to lift economic growth to 6% and halve unemployment and poverty by 2014. In order to achieve this, certain "binding constraints" to growth had to be addressed. Nevertheless, even though infrastructural spending by government lifted the investment-to-GDP ratio from around 15% in 2002 to close to 20% in 2010, the unemployment rate stayed unacceptably high at above 25%. This led to the introduction of a New Growth Plan in 2010 primarily targeting unemployment, supported by industrial policy that prioritized value-added industries. By focusing on key sectors, the government believes it can reduce unemployment from 25% to 15% by 2020. The priority sectors are infrastructure development, agriculture, mining, manufacturing, the "green" economy, and tourism. This vision for domestic economic development was expanded in November 2011 in the National Development Plan: Vision for 2030. This produces a roadmap that aims to eliminate poverty and reduce inequality in South Africa by 2030. Poverty alleviation will be achieved by breaching the ZAR418/person per month poverty line (in 2009 prices). Addressing inequality requires a decline in the South Africa Gini co-efficient from 0.7 to 0.6 points. Nonetheless, structural deficiencies, inflexible labour laws, and the highly unionized nature of the labour market are rendering the achievement of these goals extremely difficult.

South Africa is on a slower growth path in post–financial crisis period. South Africa's GDP growth rate moderated significantly to around 2.2% in the period after the commodity-price super cycle, mirroring a sharp drawback in credit-induced consumer spending and slower fix investment outlays. Structural impediments—such as a lack of sufficient electricity supply, disruptive labour actions that continue to push up the cost of doing business in the country, slow infrastructure rehabilitation, and policy uncertainty—have lowered South Africa's potential GDP growth rate to an estimated 2–2.5%. Limited fiscal and monetary space remains to support the economy through policy stimulus. In the 2015/16 national budget, newly appointed finance minister Nhlanhla Nene introduced a cap on new public-sector employment and a personal-tax hike, while the balance toward interest-rate changes moved upward. The shift in the fiscal policy averted further rating downgrades by international ratings agencies. The low growth path, combined with the large current-account deficit, remains a concern for the rating agencies. The successful implementation of the National Development Program, the sustained recovery in the global environment, and an improved labour backdrop remain necessary to improve South Africa 's growth path moving forward.

Labour markets

South Africa's population consists of diverse origins, cultures, languages, and beliefs. South Africa's population is estimated at over 50 million. Its main ethnic groups include African at 79.4%, White at 9.1%, Coloured at 8.9%, and Indian or Asian at 2.5%. South Africa has an annual population growth rate of 1.1%. HIV and AIDS in South Africa are a major health concern. According to the UN, South Africa is the country with the largest number of HIV infections in the world. The HIV prevalence rate for adults aged 15–49 is at 18.2%

The restructuring of the economy since 1994 coincided with the transformation of the labour market with an emphasis being placed on strategies that eliminate the labour inequalities. The South African labour market is characterized by an oversupply of unskilled workers who generally find employment in the informal sector of the economy, and a shortage of skilled ones, impeding the growth of the formal economy. Large additions to the labour force constituting women, especially black women, exceed formal job vacancies. This is compounded by the consistent loss of jobs in the formal sector, as the country's economy moved away from labour-intensive to capital-intensive operations. There has been a structural shift in employment away from the primary sectors to service and manufacturing related sectors, which mirrors the pattern of economic development and growth in the country. The unemployment rate remains consistently high at around 25%, with youth unemployment rife.

Trade unions play an important role in South Africa's labour relations. There are three major union federations in South Africa, whose affiliates represent a broad spectrum of industry: the Congress of South African Trade Unions (Cosatu), the Federation of Trade Unions of South Africa (Fedusa), and the National Council of Trade Unions (Nactu). These three federations form the labour constituency at the National Economic Development and Labour Council (Nedlac), together with members representing the state and business interests. A system of centralized bargaining generally leads to an annual so-called "strike season" in the country, which disrupts production.

Labour legislation introduced since 1994 has had a profound impact on the South African labour market. This is most notable in terms of the Labour Relations Act (LRA), the Basic Conditions of Employment Act (BCEA), the Employment Equity Act (EEA), and the Skills Development Act (SDA). Labour disputes are dealt with on several levels: either through bargaining councils, the Commission for Conciliation, Mediation and Arbitration (CCMA), the Labour Court, or by private arbitration. There are concerns that the economy has been overburdened with labour legislations that increase the cost of labour and of doing business in general. One of the explanations of the low job growth in South Africa was that these costs encourage companies to favour capital-intensive over labour-intensive investments, and lead to a reduction of formal labour in favour of more flexible temporary labour. Faced with increasing pressure, both from domestic employers and international investors, and as part of government's policy to accelerate growth, they have begun to amend some of the labour legislation.

Monetary system

As part of the economic transformation since 1994, the authorities began a measured dismantling of the web of protective barriers to the economy at both a trade and financial level. It also enacted well-designed and orchestrated rolling reform to liberalize the exchange rate and capital control regimes. This began with the removal of the two-tier discriminatory exchange rate regime in 1995 that unified the financial and commercial exchange rates for the rand and made all transfers on the international current account free from regulation. Although very limited regulations still exist for certain capital-account transfers above certain lower limits, notable on the capital account was the limited liberalization granted to South African financial institutions and multinational companies, which gave them license to rebalance some of their assets and operations onto a more global and optimal basis in common with the discretion enjoyed by their U.S. and European peers. Although this well-documented portfolio diversification policy placed additional pressure on South Africa's traditionally limited foreign-exchange reserve position as non-South African assets were purchased, it was nevertheless a sign by the authorities of their sincere liberalization intent and the confidence they hold in their own future. In 1998, the South African Reserve Bank (SARB) made the explicit decision to eliminate its forward currency position, an objective that was finally reached in 2004. To date, the SARB has gradually increased its foreign reserves, but has introduced the so-called "forward book" once again to help smooth out currency volatility. Nevertheless, this is only used to a limited extent and will not threaten the country's foreign-exchange position.

South Africa formally adopted inflation-targeting as the cornerstone of its monetary policy framework in early 2000. Under the policy, the SARB is tasked with keeping the monthly year-on-year change in

the consumer price index within a target range of 3–6%. This means that the monetary authorities are now targeting the rate of inflation directly, instead of following the previously applied "eclectic" monetary policy approach in which intermediate objectives still play a prominent role. This approach has enabled a structurally lowering of inflation and inflation expectations from a high of 9.3% in 2002 to within the target range.

Together with Namibia, Lesotho, and Swaziland, South Africa forms the Common Monetary Area (CMA). Under the existing arrangements, the three smaller CMA countries have ceded much of their monetary control to the SARB, which determines interest and exchange rates in the region. The South African rand also acts as an anchor, with the currencies of the other three CMA countries pegged on a par with it. In addition, capital flows freely between all the CMA countries.

Financial system

South Africa has the most advanced financial system in sub-Saharan Africa, and compares with some of the best industrialized financial systems of the world. Consequently, international banks increasingly look at South Africa as the basis for their sub-Saharan operations. The South African Reserve Bank is an autonomous body and functions in terms of the South African Reserve Bank Act of1989. Not being a member of the Basel Committee, South Africa is not obliged to translate the Basel II capital accord into domestic law, but its decision to do so is an indication of its commitment to international best practices and Basel II was implemented on 1 January 2008. Basel III is currently being implemented.

The banking sector is highly concentrated but well capitalized. The capital-adequacy requirement stood at 14.7% in December 2014, compared with the required 10.00%. Temporary market disruptions caused by the curatorship of African Bank Limited during the second half of 2014 had a limited but lasting negative impact on funding costs of South African banks. The banking sector is mostly exposed to the household and finance and insurance sectors.

The banking sector is working towards a Financial Sector Charter, and principal commitments of which include the improvement of access to financial services for low-income communities, the accelerate employment equity and skills development within the financial sector and to achieve BEE (black economic empowerment) ownership and control targets.

The non-banking financial sector and financial markets are regulated by the Financial Services Board (FSB).The regulatory environment has evolved to reduce financial sector instability. Role players in the SA Financial regulatory environment include the Financial Intelligence Centre (FIC), the National Credit Regulator (NCR) and the Department of Trade and Industry (DTI). Outside reviews, such as a financial system assessment conducted jointly with the International Monetary Fund (IMF) and the World Bank, found that South Africa was largely compliant with the standards set by the Financial Stability Forum (FSF) under the Bank for International Settlements (BIS), and that the South African authorities have worked on the areas that were identified as requiring improvements. The new National Credit Act was introduced in June 1 2007, with the aim of protecting consumers against reckless lending.

Although three different actors, the SARB, the National Treasury, and the Financial Services Board (FSB), represent a safety net in the event of a crisis, South Africa does not yet have a deposit insurance system. Nevertheless, in times of crisis, the SARB is likely to act as lender of last resorts.

The Johannesburg Securities Exchange (JSE) is one of the few internationally known African stock exchanges, and it is classified as "advanced emerging", the middle tier of the FTSE.

Founded in 1887, the JSE is the largest and best-developed exchange on the continent, with a modern electronic trading system based on the London Stock Exchange's system. In 1995, the JSE underwent a comprehensive deregulation and reform, and some of South Africa's biggest companies have de-listed from JSE and moved their primary listings to London. Nevertheless, because those companies used to dwarf the other companies in size, this has made the market more heterogeneous.

Natural resources

South Africa is rich in natural resources, and this is the economy's main external strength. Mining is an important sector, with South Africa being the world's largest producer of platinum and chromium, among other materials. Platinum, gold, and coal form the main resource exports. It has the largest resource base worldwide for platinum, manganese, chromium, vanadium, and alumino-sillicates and also has large reserve bases for vermiculite, zirconium, fluorspar, antimony, zinc, coal, lead, and uranium. Other natural resources include gold, coal, iron ore, manganese, nickel, phosphates, tin, gems, diamonds, and copper. In September 2012, several energy companies were granted exploration licenses for hydraulic fracturing (also known as “fracking”) in the Karoo area. The magnitude of the shale gas reserves has not yet been confirmed, while several environmental concerns remain. Nevertheless, South Africa is not a water-rich country, and the lack of important arterial rivers or lakes increases pressure for water conservation measures. The government policy is to decrease South Africa’s reliance on primary commodity exports and increase the value that is added to the country's minerals and metals, leading to more job creation and raised export earnings. Furthermore, the country borders both the Indian and the Atlantic oceans and has impressive mountain ranges and vast areas of protected game farms, which make it a popular tourist destination.

Demography

The results of South Africa's 2011 census, released on 30 October 2012, revealed that the population was estimated to have increased from 40.5 million in 1996 to 51.7 million in 2011, with almost 40% concentrated in the country's largest metropolitan areas. According to the UN Population Fund, the total population is estimated to have increased to 53.1 million in 2014. Urbanisation is continuing at a rapid pace in South Africa, with economic drivers for continued migration into urban areas likely to include issues such as employment opportunities, education and gaps in income. Almost every single region has seen an improvement in access to electricity, which is now accessed by 84% of households. Most regions have also experienced improved access to sanitation. However, the rapid pace of urbanisation will continue to pressure government to supply basic services. Another noteworthy feature from the census release is the size of the working-age (15–64 years) population, which is now at just over two-thirds of the total population. The report further indicated that South Africa has a relatively young population, with an overall median age of 22 years in 1996, 23 in 2001, 24 in 2007, and 25 in 2011. The majority of the population (close to 80% at the time of the 2001 census) is of the Christian faith; Hinduism is professed by the majority of Indians living in South Africa. Islam is the religion of a minority, as is the Jewish faith and traditional ethnic religious beliefs.

F Annexure F: EXAMPLES OF DELIVERABLES PER TRAFFIC ZONE

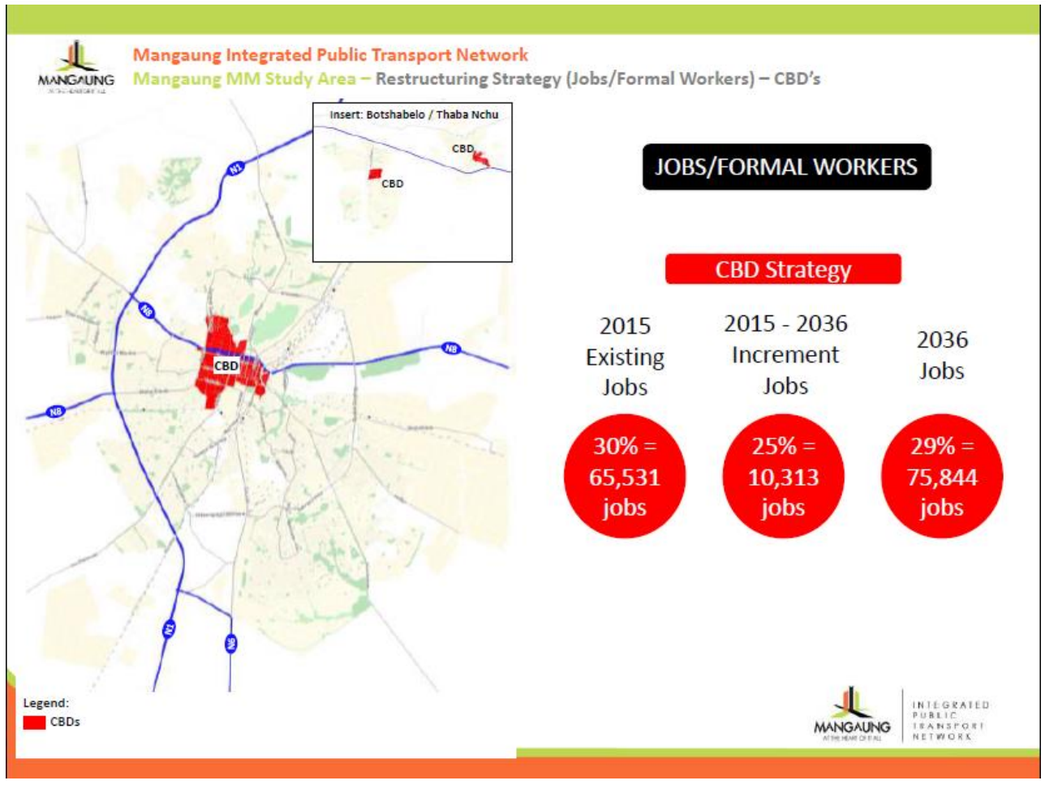
			PRODUCTIONS, 2015											
			DWELLING UNITS				POPULATION				ECONOMICALLY ACTIVE POPULATION			
Traffic Zones	Name	Reporting zones	High	Middle	Low	DU TOTAL	High	Middle	Low	POP TOTAL	Formal	Informal	Unemployed	TOTAL EA
			R12 817 +	R3 184-R12 817	R0-R3 183		R12 817 +	R3 184-R12 817	R0-R3 183					
1	CBD	1	235	318	200	752	543	637	773	1,953	901	106	107	1,115
2	Buitesig	1	19	52	24	95	77	211	256	544	267	19	43	328
37	Ooseinde Ind	3	-	-	-	-	-	-	-	-	-	-	-	-
38	Golf/Waste W T	3	1	1	1	3	2	3	3	8	5	0	0	6
39	Turf Club	3	69	65	85	219	201	226	245	672	411	39	13	463
40	Vacant land	3	2	2	3	7	6	7	8	21	13	1	0	14
41	Bloemspruit/Shannon AH	3	78	71	91	241	308	269	332	909	314	50	24	387
42	Ooseinde Ind	3	-	-	-	-	-	-	-	-	-	-	-	-
43	Thusanong/SASSA office	3	0	2	8	11	3	7	115	125	11	5	3	19
44	Heidedal	3	280	864	1,011	2,155	1,249	3,443	4,408	9,100	2,572	312	750	3,634
45	Shannon AH	3	144	132	169	445	570	498	615	1,683	581	92	44	717
46	Grasslands AH	3	9	44	68	121	50	187	248	484	121	68	51	241
47	Grasslands AH	3	17	56	230	303	71	162	616	849	268	37	109	414
48	partly Vacant land	3	37	439	1,233	1,709	137	1,639	3,668	5,444	1,426	329	691	2,446
49	Grootvlei Prison	3	102	62	23	187	353	140	4,582	5,075	356	15	14	385
50	Rodenbeck	3	310	3,695	10,383	14,388	1,154	13,796	30,878	45,828	12,008	2,768	5,813	20,589
51	Bloemspruit	3	1,062	2,723	8,190	11,975	3,841	9,520	23,510	36,872	10,877	1,925	4,410	17,213
52	Bloemside	3	65	449	1,034	1,549	245	1,773	3,548	5,566	1,386	179	715	2,280
53	Bloemside	3	154	588	1,262	2,004	615	2,384	4,172	7,171	1,783	335	641	2,759
54	Heidedal	3	418	385	212	1,015	1,564	1,465	809	3,838	1,288	251	212	1,751
55	Heidedal	3	823	1,152	959	2,935	3,517	4,861	3,746	12,124	3,970	424	912	5,306
56	Batho	3	185	1,198	2,540	3,924	604	4,061	6,634	11,298	3,348	439	1,441	5,228
57	Batho	3	5	92	282	380	16	319	768	1,102	221	88	254	563
58	Batho	3	23	146	310	479	74	496	810	1,380	409	54	176	639
59	Pelonomi Hospital	3	31	96	112	239	139	383	490	1,011	286	35	83	404
60	Bochabela	3	121	548	903	1,571	407	1,616	2,124	4,148	1,196	227	452	1,875

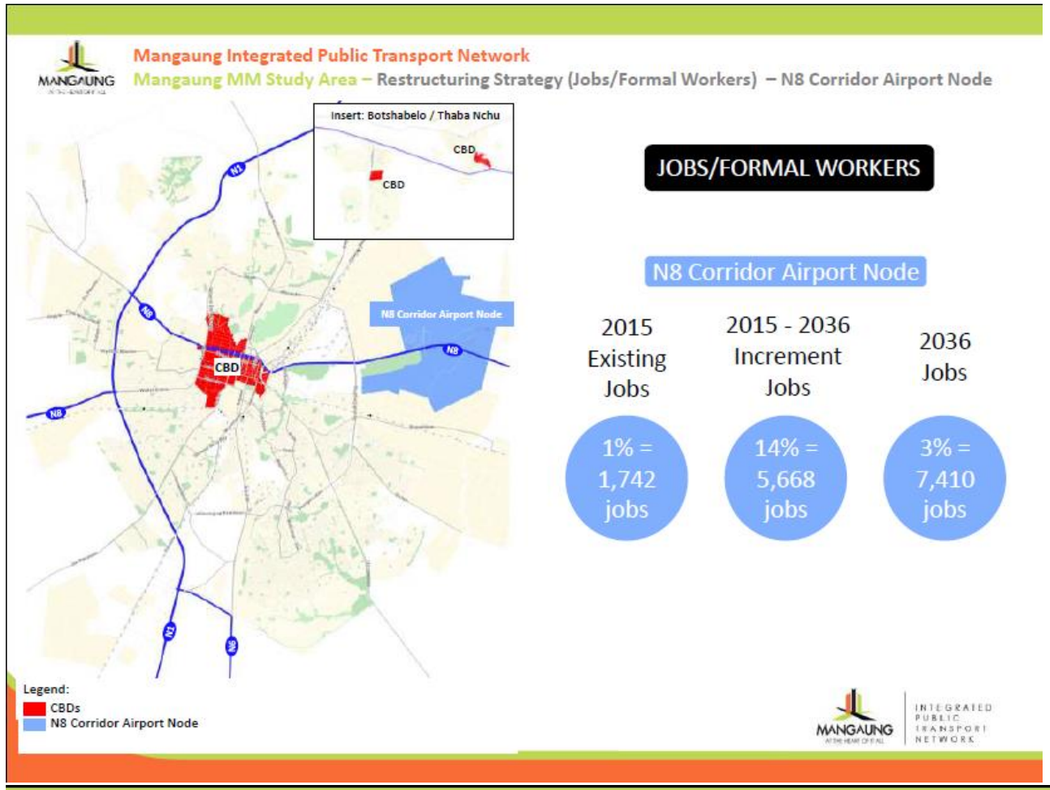
			ATTRACTIONS, 2015												
			FLOOR AREA m²		FORMAL WORKERS										
Traffic Zones	Name	Reporting zones	Retail	Office	Retail	Office	Industrial	Commer-cial	Local Serving	Other	Agriculture & Mining	Construc-tion	Transport	Domestic workers	Total Formal
			m²	m²	Workers	Workers	Workers	Workers	Workers	Workers	Workers	Workers	Workers	Workers	Workers
1	CBD	1	256,703	469,910	7,293	26,005	330	0	3,387	0	-	552	711	161	38,438
2	Buitesig	1	-	-	-	-	0	9	11	0	-	-	2	15	38
37	Ooseinde Ind	3	-	32,290	-	1,787	1006	0	50	0	-	552	53	-	3,448
38	Golf/Waste W T	3	-	-	-	-	139	0	48	0	-	-	4	1	191
39	Turf Club	3	-	-	-	-	0	0	18	0	-	55	4	44	122
40	Vacant land	3	-	-	-	-	0	0	0	0	-	-	0	1	2
41	Bloemspruit/Shannon AH	3	200	-	6	-	0	80	125	0	-	-	8	50	269
42	Ooseinde Ind	3	-	-	-	-	1516	0	-	0	-	552	29	-	2,096
43	Thusanong/SASSA office	3	451	6,237	13	345	0	0	82	0	-	-	8	0	449
44	Heidedal	3	37,435	-	1,063	-	128	0	506	0	-	55	72	241	2,065
45	Shannon AH	3	1,998	-	57	-	0	129	138	0	-	55	14	92	486
46	Grasslands AH	3	-	-	-	-	0	0	10	0	-	-	2	9	21
47	Grasslands AH	3	204	-	6	-	0	0	10	0	-	55	6	15	92
48	partly Vacant land	3	-	-	-	-	0	0	100	0	-	55	34	64	253
49	Grootvlei Prison	3	-	-	-	-	0	0	116	1058	-	-	26	62	1,262
50	Rodenbeck	3	4,817	252	137	14	0	0	1,119	0	-	55	295	540	2,159
51	Bloemspruit	3	2,392	-	68	-	0	0	797	0	-	55	242	856	2,018
52	Bloemside	3	123	-	3	-	0	0	131	0	-	-	32	81	247
53	Bloemside	3	-	-	-	-	0	0	147	0	-	55	40	143	386
54	Heidedal	3	22,975	22,975	653	1,271	0	0	90	0	-	-	57	269	2,340
55	Heidedal	3	7,025	364	200	20	0	0	690	0	-	55	72	568	1,605
56	Batho	3	1,825	-	52	-	0	0	392	0	-	55	82	222	803
57	Batho	3	-	-	-	-	0	0	22	0	-	-	8	12	42
58	Batho	3	794	225	23	12	0	0	107	0	-	-	12	27	181
59	Pelonomi Hospital	3	-	-	-	-	0	0	476	0	-	-	13	27	516
60	Bochabela	3	198	1,498	6	83	0	0	200	0	-	-	35	121	445

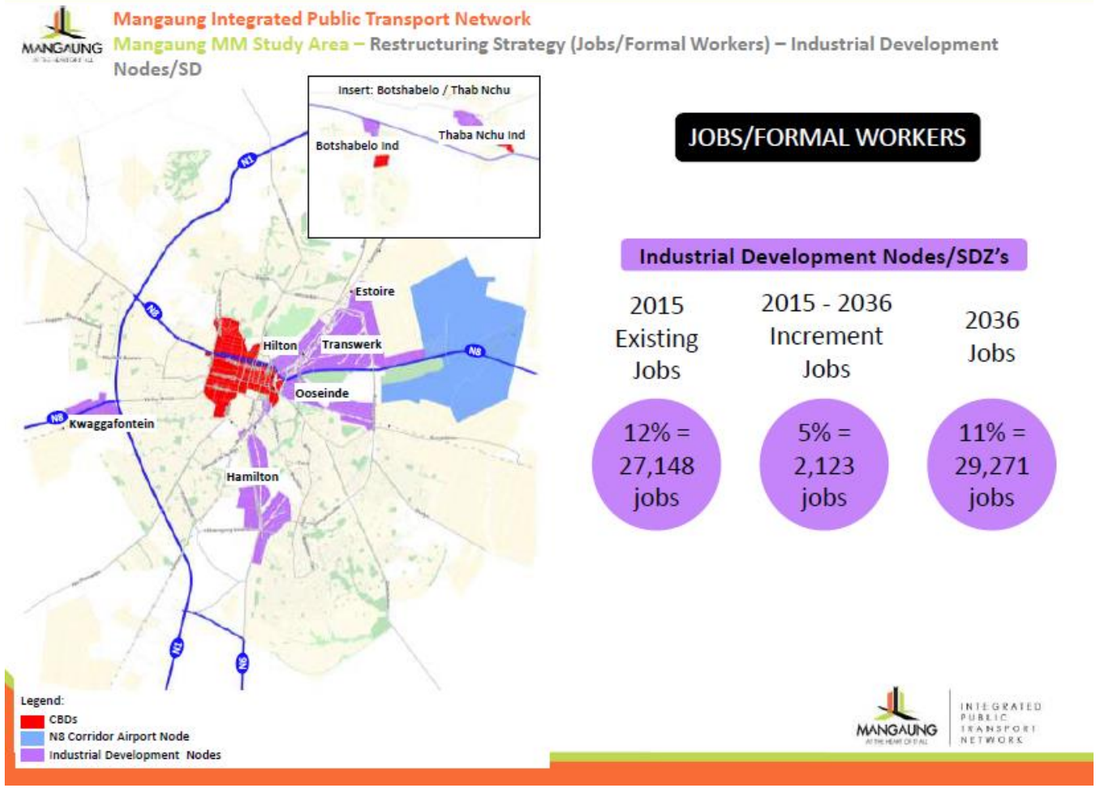
JOB OPPORTUNITIES ALLOCATION PER TRANSFORMATION OBJECTIVES

SPATIAL TRANSFORMATION OBJECTIVES – allocation of JOBS

1. **PROMOTE ECONOMIC DEVELOPMENT**
   - CBD'S (Bloemfontein, Thaba Nchu, Botshabelo).
   - N-8 Corridor (Airport Node)
   - Industrial Development Nodes (Transwerk, Hilton, Ooseinde, Hamilton, Thaba Nchu, Botshabelo).
   - Other Nodes (Waaihoek, New node in Botshabelo, Soutpan, nodes in disadvantaged areas).
2. **DE-RACIALISING THE BUILT ENVIRONMENT**
   - 7 Land Parcels (Cecilia, Pellissier Infill, Brandkop, Brandkop racecourse, Vista Park x2 and x3, Hillside view and x34, x35, Estoire.
3. **INTENSIFICATION/DENSIFICATION**
   - IRPTN Corridor.
   - Existing Urban area
4. **LIMIT SPATIAL FRAGMENTATION – PROMOTE SPATIAL INTEGRATION**
5. **RURAL DEVELOPMENT**

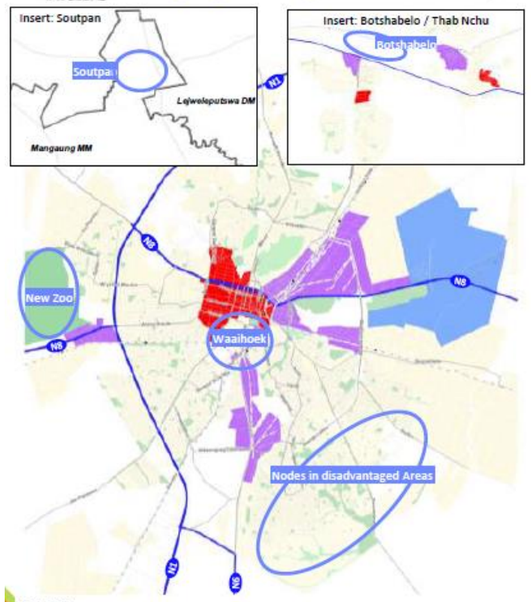






Mangaung Integrated Public Transport Network

Mangaung MM Study Area – Restructuring Strategy (Jobs/Formal Workers) – Other Nodes



JOBS/FORMAL WORKERS

Other Nodes

2015 Existing Jobs	2015 - 2036 Increment Jobs	2036 Jobs
6% = 13,897 jobs	11% = 4,431 jobs	7% = 18,328 jobs

SPATIAL TRANSFORMATION OBJECTIVES – allocation of JOBS

1. **PROMOTE ECONOMIC DEVELOPMENT**
   - CBD'S (Bloemfontein, Thaba Nchu, Botshabelo).
   - N-8 Corridor (Airport Node)
   - Industrial Development Nodes (Transwerk, Hilton, Ooseinde, Hamilton, Thaba Nchu, Botshabelo).
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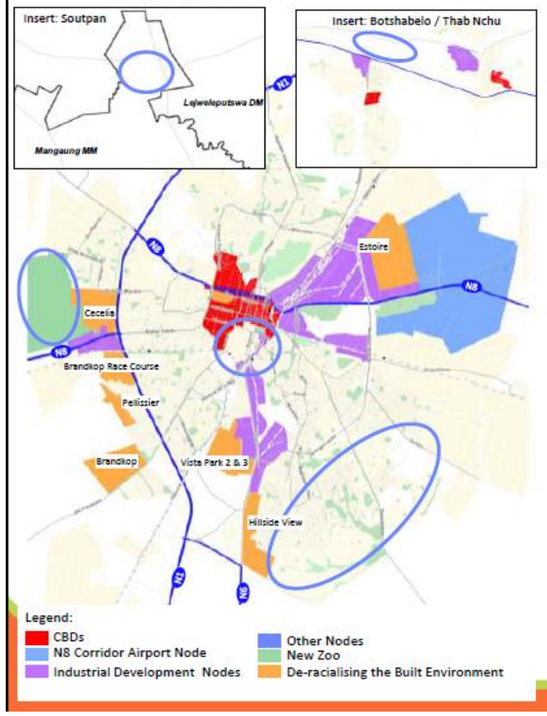
   - 7 Land Parcels (Cecilia, Pellissier Infill, Brandkop, Brandkop racecourse, Vista Park x2 and x3, Hillside view and x34, x35, Estoire.
3. **INTENSIFICATION/DENSIFICATION**
   - IRPTN Corridor.
   - Existing Urban area
4. **LIMIT SPATIAL FRAGMENTATION – PROMOTE SPATIAL INTEGRATION**
5. **RURAL DEVELOPMENT**

SPATIAL TRANSFORMATION OBJECTIVES (JOBS) – RESULTS 2015 - 2036

IDP Objective	Existing 2015 Jobs	2036 Jobs	Increment 2015 - 2036 Jobs	Existing 2015 (%) Jobs	2036 (%) Jobs	Increment 2015 - 2036 (%) Jobs
-ECONOMIC DEVELOPMENT	108,319	130,854	22,535	49%	50%	54%
• Central Business Districts	65,531	75,844	10,313	30%	29%	25%
• N8-Corridor	1,742	7,410	5,668	1%	3%	14%
• Industrial Development Nodes/SDZ's	27,148	29,271	2,123	12%	11%	5%
• Other Nodes	13,897	18,328	4,431	6%	7%	11%
-DE-RACIALISING THE BUILT ENVIRONMENT	6,757	18,216	11,459	3%	7%	27%
• 7 Land Parcels	6,757	18,216	11,459	3%	7%	27%
-INTENSIFICATION/DENSIFICATION/INFILL	85,271	90,900	5,629	39%	35%	13%
• IRPTN Corridor	18,379	20,560	2,181	8%	8%	5%
• Existing Urban area	66,892	70,340	3,448	30%	27%	8%
-SPATIAL FRAGMENTATION	5,778	9,407	3,629	3%	4%	9%
-RURAL DEVELOPMENT	15,003	13,622	(1,381)	7%	5%	-3%
TOTAL MANGAUNG MM	221,129	263,000	41,871	100%	100%	100%

Mangaung Integrated Public Transport Network

Mangaung MM Study Area – Restructuring Strategy (Jobs/Formal Workers) – De-racialising the Built Environment



JOBS/FORMAL WORKERS

De-Racialising the Built Environment

2015 Existing Jobs	2015 - 2036 Increment Jobs	2036 Jobs
3% = 6,757 jobs	27% = 11,459 jobs	7% = 18,216 jobs

SPATIAL TRANSFORMATION OBJECTIVES – allocation of JOBS

1. **PROMOTE ECONOMIC DEVELOPMENT**
   - CBD'S (Bloemfontein, Thaba Nchu, Botshabelo).
   - N-8 Corridor (Airport Node)
   - Industrial Development Nodes (Transwerk, Hilton, Ooseinde, Hamilton, Thaba Nchu, Botshabelo).
   - Other Nodes (Waaihoek, New node in Botshabelo, Soutpan, nodes in disadvantaged areas).
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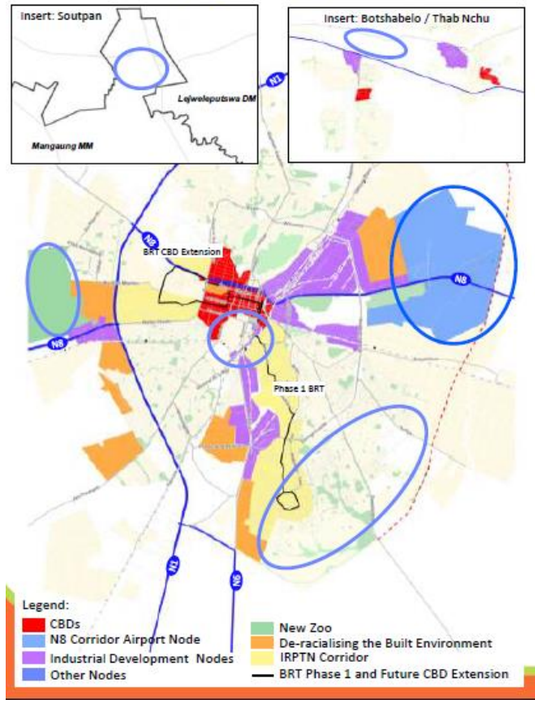
   - 7 Land Parcels (Cecilia, Pellissier Infill, Brandkop, Brandkop racecourse, Vista Park x2 and x3, Hillside view and x34, x35, Estoire.
3. **INTENSIFICATION/DENSIFICATION**
   - IRPTN Corridor.
   - Existing Urban area
4. **LIMIT SPATIAL FRAGMENTATION – PROMOTE SPATIAL INTEGRATION**
5. **RURAL DEVELOPMENT**

MANGAUNG AT THE HEART OF IT ALL | INTEGRATED PUBLIC TRANSPORT NETWORK

Mangaung Integrated Public Transport Network
Mangaung MM Study Area – Restructuring Strategy (Jobs/Formal Workers) – IRPTN Corridor



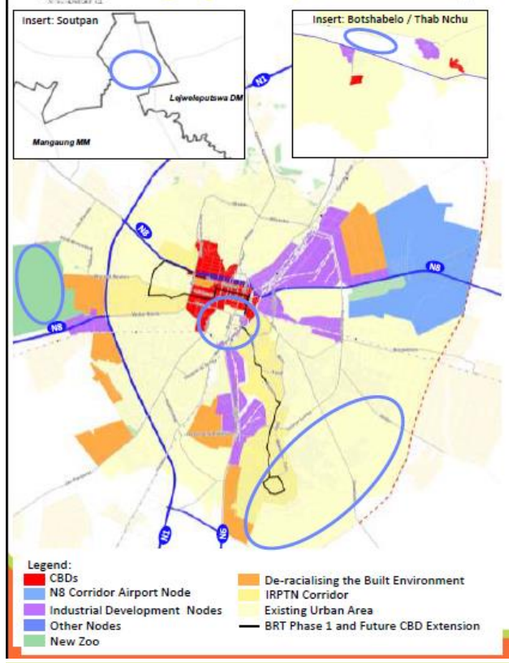
JOBS/FORMAL WORKERS

IRPTN Corridor

2015 Existing Jobs	2015 - 2036 Increment Jobs	2036 Jobs
8% = 18,379 jobs	5% = 2,181 jobs	8% = 20,560 jobs

MANGAUNG AT THE HEART OF IT ALL | INTEGRATED PUBLIC TRANSPORT NETWORK

Mangaung Integrated Public Transport Network
Mangaung MM Study Area – Restructuring Strategy (Jobs/Formal Workers) – Existing Urban Area



JOBS/FORMAL WORKERS

Existing Urban Area

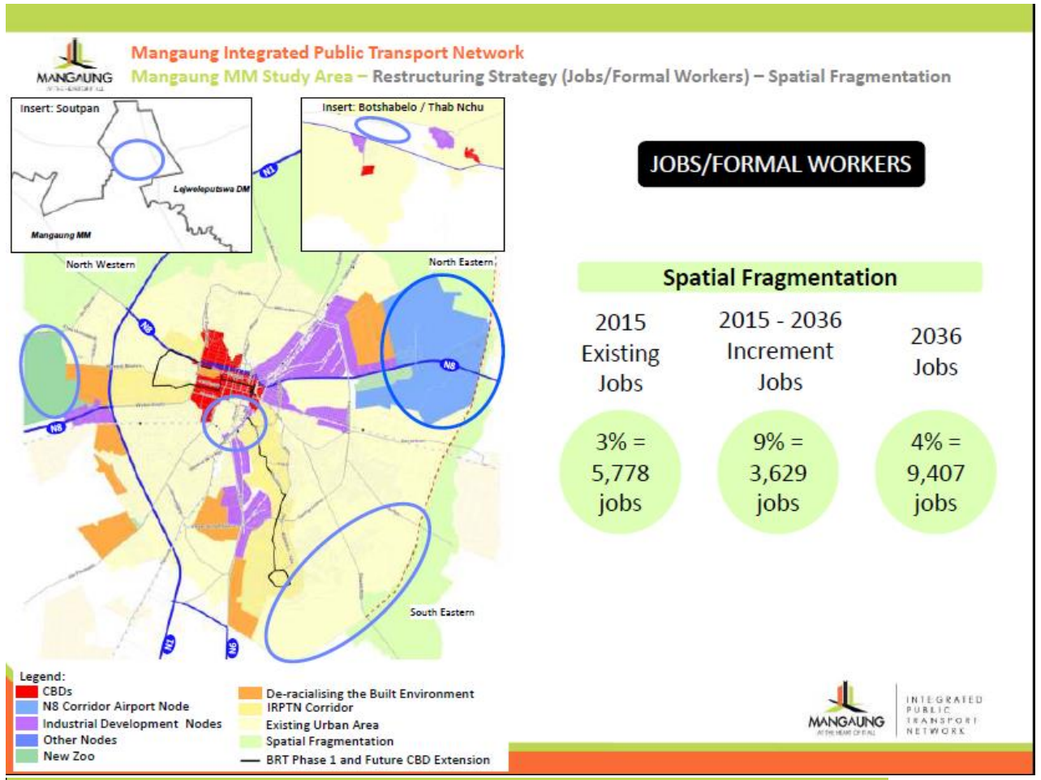
2015 Existing Jobs	2015 - 2036 Increment Jobs	2036 Jobs
30% = 66,892 jobs	8% = 3,448 jobs	27% = 70,340 jobs

MANGAUNG AT THE HEART OF IT ALL | INTEGRATED PUBLIC TRANSPORT NETWORK

SPATIAL TRANSFORMATION OBJECTIVES (JOBS) – RESULTS 2015 - 2036

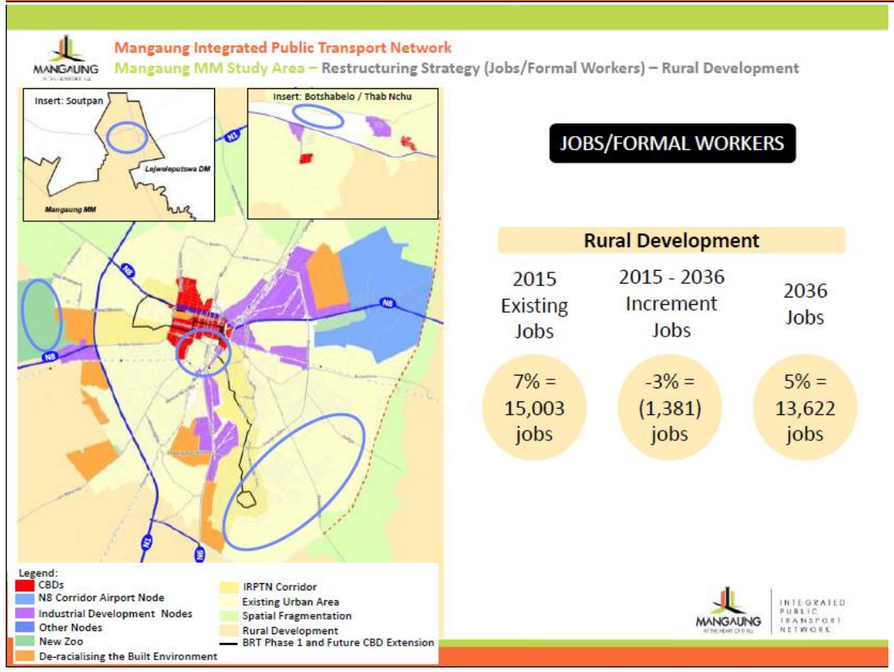
IDP Objective	Existing 2015 Jobs	2036 Jobs	Increment 2015 - 2036 Jobs	Existing 2015 (%) Jobs	2036 (%) Jobs	Increment 2015 - 2036 (%) Jobs
-ECONOMIC DEVELOPMENT	108,319	130,854	22,535	49%	50%	54%
• Central Business Districts	65,531	75,844	10,313	30%	29%	25%
• N8-Corridor	1,742	7,410	5,668	1%	3%	14%
• Industrial Development Nodes/SDZ's	27,148	29,271	2,123	12%	11%	5%
• Other Nodes	13,897	18,328	4,431	6%	7%	11%
-DE-RACIALISING THE BUILT ENVIRONMENT	6,757	18,216	11,459	3%	7%	27%
• 7 Land Parcels	6,757	18,216	11,459	3%	7%	27%
-INTENSIFICATION/DENSIFICATION/INFILL	85,271	90,900	5,629	39%	35%	13%
• IRPTN Corridor	18,379	20,560	2,181	8%	8%	5%
• Existing Urban area	66,892	70,340	3,448	30%	27%	8%
-SPATIAL FRAGMENTATION	5,778	9,407	3,629	3%	4%	9%
-RURAL DEVELOPMENT	15,003	13,622	(1,381)	7%	5%	-3%
TOTAL MANGAUNG MM	221,129	263,000	41,871	100%	100%	100%

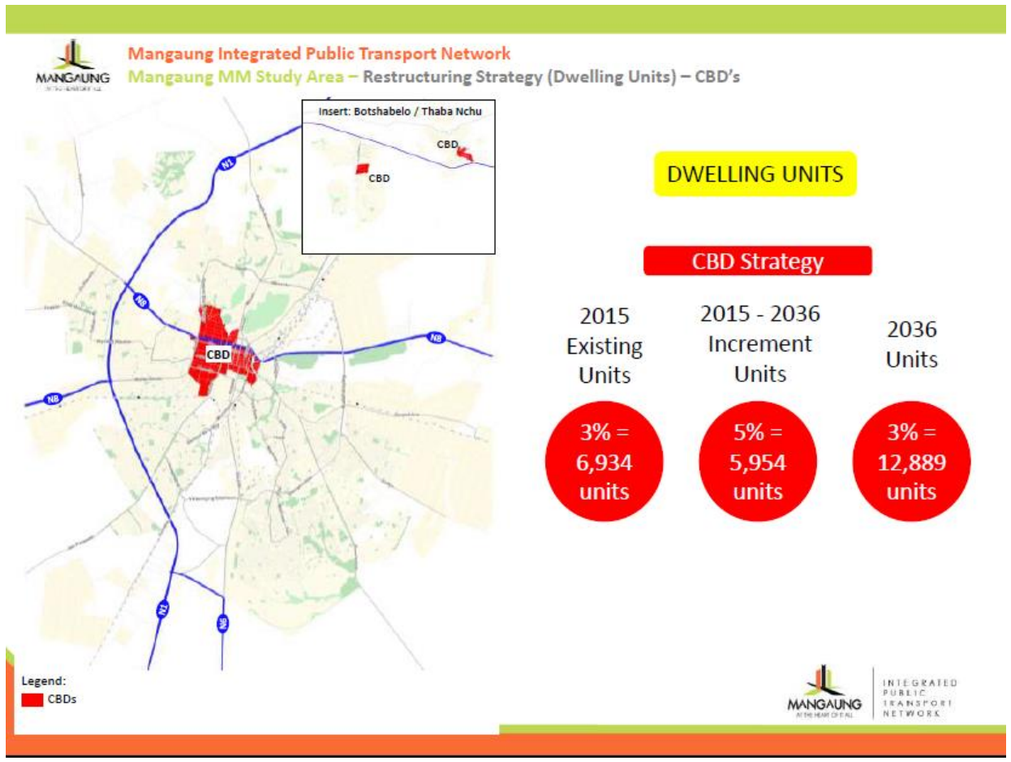
MANGAUNG AT THE HEART OF IT ALL | INTEGRATED PUBLIC TRANSPORT NETWORK



SPATIAL TRANSFORMATION OBJECTIVES – allocation of RESIDENTIAL UNITS

1. **PROMOTE ECONOMIC DEVELOPMENT**
   - CBD'S (Bloemfontein, Thaba Nchu, Botshabelo).
   - N-8 Corridor (Airport Node)
   - Industrial Development Nodes (Transwerk, Hilton, Ooseinde, Hamilton, Thaba Nchu, Botshabelo).
   - Other Nodes (Waaihoek, New node in Botshabelo, Soutpan, nodes in disadvantaged areas).
2. **DE-RACIALISING THE BUILT ENVIRONMENT**
   - 7 Land Parcels (Cecilia, Pellissier Infill, Brandkop, Brandkop racecourse, Vista Park x2 and x3, Hillside view and x34, x35, Estoire.
3. **INTENSIFICATION/DENSIFICATION**
   - IRPTN Corridor.
   - Existing Urban area
4. **LIMIT SPATIAL FRAGMENTATION – PROMOTE SPATIAL INTEGRATION**
5. **RURAL DEVELOPMENT**

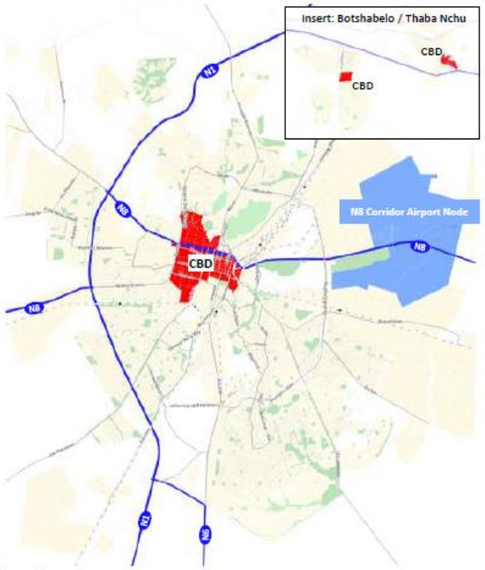




ANNEXURE 4.2.A: DWELLING UNIT GROWTH ALLOCATION PER TRANSFORMATION OBJECTIVES

Mangaung Integrated Public Transport Network

Mangaung MM Study Area – Restructuring Strategy (Dwelling Units) – N8 Corridor Airport Node



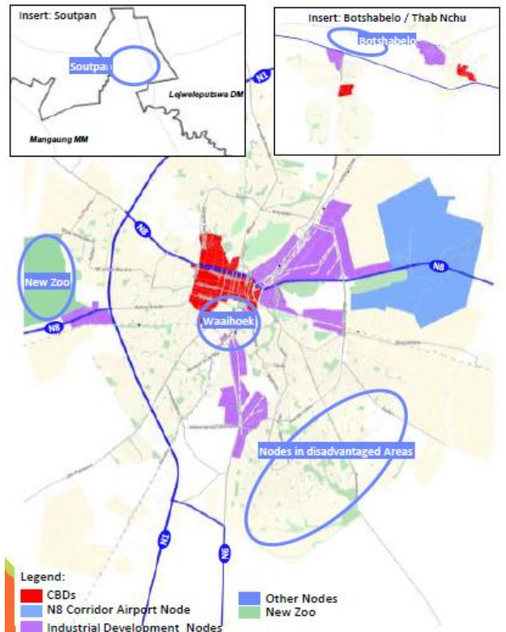
DWELLING UNITS

N8 Corridor Airport Node

2015 Existing Units	2015 - 2036 Increment Units	2036 Units
0% = 1,146 units	9% = 10,016 units	3% = 11,163 units

Mangaung Integrated Public Transport Network

Mangaung MM Study Area – Restructuring Strategy (Dwelling Units) – Other Nodes



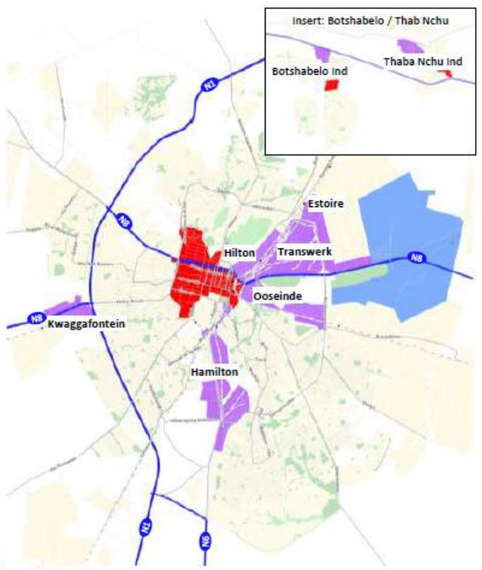
DWELLING UNITS

Traffic Zones containing Other Nodes

2015 Existing Units	2015 - 2036 Increment Units	2036 Units
19% = 49,555 units	12% = 13,932 units	17% = 63,486 units

Mangaung Integrated Public Transport Network

Mangaung MM Study Area – Restructuring Strategy (Dwelling Units) – Industrial Development Nodes/SDZ's



DWELLING UNITS

Industrial Traffic Zones

2015 Existing Units	2015 - 2036 Increment Units	2036 Units
2% = 6,253 units	2% = 2,225 units	2% = 8,478 units

SPATIAL TRANSFORMATION OBJECTIVES (UNITS) – RESULTS 2015 - 2036

IDP Objective	Existing 2015 Units	2036 Units	Increment 2015 - 2036 Units	Existing 2015 (%) Units	2036 (%) Units	Increment 2015 - 2036 (%) Units
-ECONOMIC DEVELOPMENT	63,888	96,016	32,127	24%	26%	28%
• Central Business Districts	6,934	12,889	5,954	3%	3%	5%
• N8-Corridor	1,146	11,163	10,016	0%	3%	9%
• Industrial Development Nodes/SDZ's	6,253	8,478	2,225	2%	2%	2%
• Other Nodes	49,555	63,486	13,932	19%	17%	12%
-DE-RACIALISING THE BUILT ENVIRONMENT	2,512	22,995	20,484	1%	6%	18%
• 7 Land Parcels	2,512	22,995	20,484	1%	6%	18%
-INTENSIFICATION/DENSIFICATION/INFILL	176,545	222,267	45,722	68%	59%	40%
• IRPTN Corridor	41,652	52,750	11,097	16%	14%	10%
• Existing Urban area	134,892	169,517	34,625	52%	45%	31%
-SPATIAL FRAGMENTATION	6,686	18,019	11,333	3%	5%	10%
-RURAL DEVELOPMENT	11,612	15,154	3,542	4%	4%	3%
TOTAL MANGAUNG MM	261,242	374,451	113,209	100%	100%	100%

SPATIAL TRANSFORMATION OBJECTIVES – allocation of RESIDENTIAL UNITS

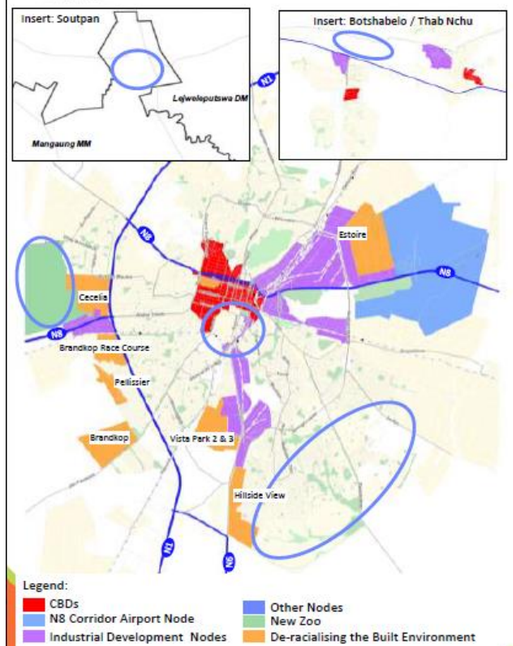
1. **PROMOTE ECONOMIC DEVELOPMENT**
   - CBD'S (Bloemfontein, Thaba Nchu, Botshabelo).
   - N-8 Corridor (Airport Node)
   - Industrial Development Nodes (Transwerk, Hilton, Ooseinde, Hamilton, Thaba Nchu, Botshabelo).
   - Other Nodes (Waaihoek, New node in Botshabelo, Soutpan, nodes in disadvantaged areas).
2. **DE-RACIALISING THE BUILT ENVIRONMENT**
   - 7 Land Parcels (Cecilia, Pellissier Infill, Brandkop, Brandkop racecourse, Vista Park x2 and x3, Hillside view and x34, x35, Estoire.
3. **INTENSIFICATION/DENSIFICATION**
   - IRPTN Corridor.
   - Existing Urban area
4. **LIMIT SPATIAL FRAGMENTATION**
5. **RURAL DEVELOPMENT**

MANGAUNG AT THE HEART OF ALL | INTEGRATED PUBLIC TRANSPORT NETWORK

MANGAUNG

Mangaung Integrated Public Transport Network

Mangaung MM Study Area – Restructuring Strategy (Dwelling Units) – De-racialising the Built Environment



DWELLING UNITS

De-Racialising the Built Environment

2015 Existing Units	2015 - 2036 Increment Units	2036 Units
1% = 2,512 units	18% = 20,484 units	6% = 22,995 units

MANGAUNG | INTEGRATED PUBLIC TRANSPORT NETWORK

SPATIAL TRANSFORMATION OBJECTIVES (UNITS) – RESULTS 2015 - 2036

IDP Objective	Existing 2015 Units	2036 Units	Increment 2015 - 2036 Units	Existing 2015 (%) Units	2036 (%) Units	Increment 2015 - 2036 (%) Units
-ECONOMIC DEVELOPMENT	63,888	96,016	32,127	24%	26%	28%
• Central Business Districts	6,934	12,889	5,954	3%	3%	5%
• N8-Corridor	1,146	11,163	10,016	0%	3%	9%
• Industrial Development Nodes/SDZ's	6,253	8,478	2,225	2%	2%	2%
• Other Nodes	49,555	63,486	13,932	19%	17%	12%
-DE-RACIALISING THE BUILT ENVIRONMENT	2,512	22,995	20,484	1%	6%	18%
• 7 Land Parcels	2,512	22,995	20,484	1%	6%	18%
-INTENSIFICATION/DENSIFICATION/INFILL	176,545	222,267	45,722	68%	59%	40%
• IRPTN Corridor	41,652	52,750	11,097	16%	14%	10%
• Existing Urban area	134,892	169,517	34,625	52%	45%	31%
-SPATIAL FRAGMENTATION	6,686	18,019	11,333	3%	5%	10%
-RURAL DEVELOPMENT	11,612	15,154	3,542	4%	4%	3%
TOTAL MANGAUNG MM	261,242	374,451	113,209	100%	100%	100%

MANGAUNG AT THE HEART OF ALL | INTEGRATED PUBLIC TRANSPORT NETWORK

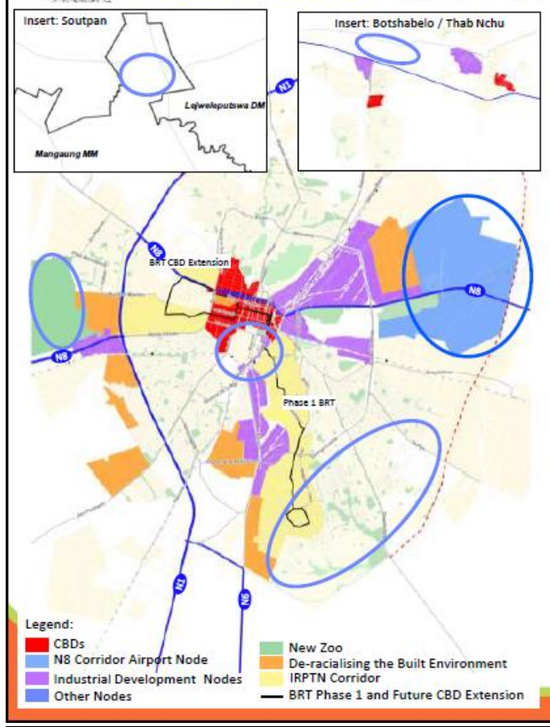
SPATIAL TRANSFORMATION OBJECTIVES – allocation of RESIDENTIAL UNITS

1. **PROMOTE ECONOMIC DEVELOPMENT**
   - CBD'S (Bloemfontein, Thaba Nchu, Botshabelo).
   - N-8 Corridor (Airport Node)
   - Industrial Development Nodes (Transwerk, Hilton, Ooseinde, Hamilton, Thaba Nchu, Botshabelo).
   - Other Nodes (Waaihoek, New node in Botshabelo, Soutpan, nodes in disadvantaged areas).
2. **DE-RACIALISING THE BUILT ENVIRONMENT**
   - 7 Land Parcels (Cecilia, Pellissier Infill, Brandkop, Brandkop racecourse, Vista Park x2 and x3, Hillside view and x34, x35, Estoire.
3. **INTENSIFICATION/DENSIFICATION**
   - IRPTN Corridor.
   - Existing Urban area
4. **LIMIT SPATIAL FRAGMENTATION – PROMOTE SPATIAL INTEGRATION**
5. **RURAL DEVELOPMENT**

MANGAUNG AT THE HEART OF ALL | INTEGRATED PUBLIC TRANSPORT NETWORK

Mangaung Integrated Public Transport Network

Mangaung MM Study Area – Restructuring Strategy (Dwelling Units) – IRPTN Corridor



DWELLING UNITS

IRPTN Corridor

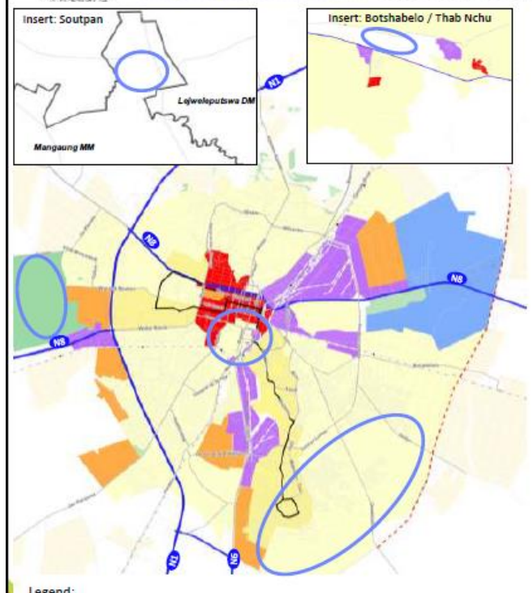
2015 Existing Units	2015 - 2036 Increment Units	2036 Units
16% = 41,652 units	10% = 11,097 units	14% = 52,750 units

SPATIAL TRANSFORMATION OBJECTIVES (UNITS) – RESULTS 2015 - 2036

IDP Objective	Existing 2015 Units	2036 Units	Increment 2015 - 2036 Units	Existing 2015 (%) Units	2036 (%) Units	Increment 2015 - 2036 (%) Units
-ECONOMIC DEVELOPMENT	63,888	96,016	32,127	24%	26%	28%
• Central Business Districts	6,934	12,889	5,954	3%	3%	5%
• N8-Corridor	1,146	11,163	10,016	0%	3%	9%
• Industrial Development Nodes/SDZ's	6,253	8,478	2,225	2%	2%	2%
• Other Nodes	49,555	63,486	13,932	19%	17%	12%
-DE-RACIALISING THE BUILT ENVIRONMENT	2,512	22,995	20,484	1%	6%	18%
• 7 Land Parcels	2,512	22,995	20,484	1%	6%	18%
-INTENSIFICATION/DENSIFICATION/INFILL	176,545	222,267	45,722	68%	59%	40%
• IRPTN Corridor	41,652	52,750	11,097	16%	14%	10%
• Existing Urban area	134,892	169,517	34,625	52%	45%	31%
-SPATIAL FRAGMENTATION	6,686	18,019	11,333	3%	5%	10%
-RURAL DEVELOPMENT	11,612	15,154	3,542	4%	4%	3%
TOTAL MANGAUNG MM	261,242	374,451	113,209	100%	100%	100%

Mangaung Integrated Public Transport Network

Mangaung MM Study Area – Restructuring Strategy (Dwelling Units) – Existing Urban Area



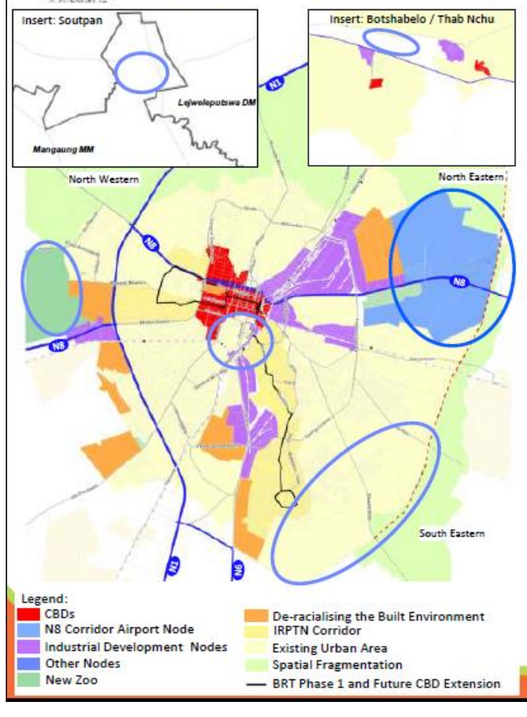
DWELLING UNITS

Existing Urban Area

2015 Existing Units	2015 - 2036 Increment Units	2036 Units
52% = 134,892 units	31% = 34,625 units	45% = 169,517 units

Mangaung Integrated Public Transport Network

Mangaung MM Study Area – Restructuring Strategy (Dwelling Units) – Spatial Fragmentation



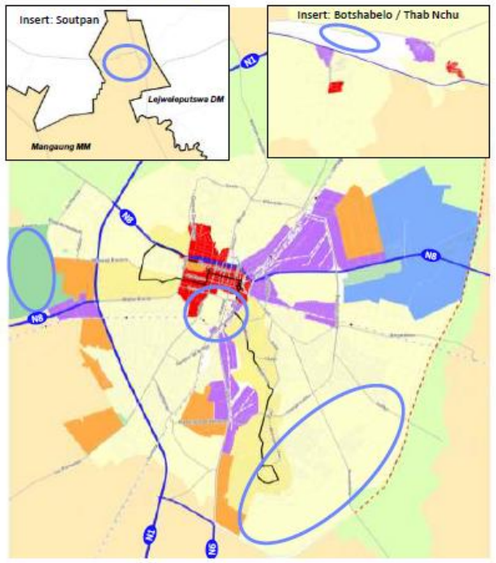
DWELLING UNITS

Spatial Fragmentation

2015 Existing Units	2015 - 2036 Increment Units	2036 Units
3% = 6,686 units	10% = 11,333 units	5% = 18,019 units

Mangaung Integrated Public Transport Network

Mangaung MM Study Area – Restructuring Strategy (Dwelling Units) – Rural Development



DWELLING UNITS

Rural Development

2015 Existing Units	2015 - 2036 Increment Units	2036 Units
4% = 11,612 units	3% = 3,542 units	4% = 15,154 units

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