MODERNIZATION OF DAVAO’S TRANSPORTATION SYSTEM

Engr. Manuel T. Jamonir, CE, EnP
Assistant Vice-President for Operations
Udenna Infrastructure Corp.
Philippines
A Davao-City based company founded in 2002 by Dennis A. Uy who is at the helm of the UDENNA Group of Companies.
Markets

The Secret Weapon That Has Made the Philippine Peso So Strong

By David Finnerty
November 3, 2019, 8:00 AM GMT+8  Updated on November 4, 2019, 7:00 AM GMT+8

- Real yields have risen to 3.77% from as low as 0.33% last year
- Economists predict data this will show CPI slowed in October

TOP 10 EMERGING COUNTRIES THAT WILL DOMINATE THE GLOBAL ECONOMY IN THE NEXT DECADE

1. India
6. Turkey
2. Philippines
7. Thailand
3. Indonesia
8. Chile
4. China
9. Poland
5. Malaysia
10. South Africa

PH climbs in list of business-friendly economies

Metro Manila (CNN Philippines, October 24) — The Philippines topped big gains in terms of being more business-friendly as permits and requirements have been relaxed, according to the World Bank.

The Philippines climbed to the 95th spot in the global lender’s latest Ease of Doing Business report, improving from 124th place last year. The country’s raw score improved to 62.8 from 57.68 previously, with the World Bank citing three game-changers for new businesses.

The index compares the business climate across 190 economies in terms of starting a business. The list saw New Zealand, Singapore, Hong Kong, Denmark, and South Korea as the most business-friendly locations, little changed from 2018 results.

The report factored in changes implemented between May 2018 and May 2019, taking note which of these reforms made business transactions simpler. Quszon City was used as the benchmark for the Philippines.

The World Bank said the removal of the minimum capital requirement for local firms made it easier for startups. Meanwhile, tighter rules that mandate the disclosure of transactions with interested parties and enhanced director liability have protected minority investors better, the World Bank said.

"The Philippines made dealing with construction permits easier by improving coordination and streamlining the process for obtaining an occupancy certificate," the report added.

Metro Manila (CNN Philippines, October 31) — The Philippines topped big gains in terms of being more business-friendly as permits and requirements have been relaxed, according to the World Bank.

"The Philippines has improved its ranking, showing that the country is becoming more business-friendly," the report said.

The Philippines improved in shipping connectivity scorecard, among biggest in tonnage

November 11, 2019 | 12:08 am
About the Philippines

Land Area: 300,000 sq.km.
Population: 100.9 million
Literacy: 98% (2018)
Employment: 94.6% (July 2019)

Growth Centers:
- Manila
- Cebu
- Davao
- Cagayan de Oro
- Zamboanga City
- Gen Santos City

Cities:
- Clark
- Manila
- Cebu
- Davao
- Cagayan de Oro
- Zamboanga City
- Gen Santos City

Bounding Box:
- (0,0) to (1000,1000)

Map:
- Philippines
- Manila
- Cebu
- Davao
- Cagayan de Oro
- Zamboanga City
- Gen Santos City

World Map:
- Philippines
- Manila
- Cebu
- Davao
- Cagayan de Oro
- Zamboanga City
- Gen Santos City

World Cities:
- Tokyo
- Beijing
- Jakarta
- Kuala Lumpur
- Sydney
- Manila

Other:
- Singapore
- Ontario
- Canada

Numbers:
- 300,000
- 100.9
- 98%
- 94.6%
**Economic Highlights and Prospects**

**The Philippines will be an upper middle-income country\(^1\) in 2020.**

**Unemployment is at its lowest in 40 years.**

**Drop in unemployment translates to drop in poverty incidence.**

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\(^1\) Based on World Bank threshold

Source: Department of Finance, The Asset Philippine Forum October 2019

Source: Department of Finance, The Asset Philippine Forum October 2019

Source: Department of Finance, The Asset Philippine Forum October 2019
INFRASTRUCTURE as catalyst for national growth

More Railways, Urban Mass Transport, Airports & Seaports
More Bridges & Roads
New & Better Cities

Source: Philippines’ Department of Budget and Management
About Davao City, Philippines

- Land Area: 2,444 sq.km.
- Population: 1.6M (2015)
- Employment: 93% (2015)
- Literacy: 98.7% (2015)
- Regional GDP: 8.6% growth

- 3x larger than Manila, 4x larger than Singapore
- @2.8% growth rate, 3rd most populated city in the Phils.
- Regional GDP growth rate is consistently higher than national levels
Davao – It’s safer than you think

1 of only 6 Asian cities in the top 60 safest cities in the world

54 Davao Philippines 72.58

First of its kind in Asia and third in the world after the USA and Canada

Services (ALL FREE OF CHARGE):
1. Emergency Calls Answering Point and Dispatch (ECAP-D)
2. Emergency Medical Services (EMS)
3. Urban Search and Rescue (USAR)
4. Fire Auxiliary Services (FAS)
5. K-9 Unity

Source: Numbeo
Davao City’s transformation through the years…

**Population**
- Population: 1.6M
- Population: 0.6M
- 2.30% annual average growth rate in 2010 to 2015
- 409,951 households in 2015
- 51% Male

**GRDP Growth Rates, Davao Region 2012-2018**
*In thousand pesos, at constant 2000 prices*

**Investments**

**Business Bureau - Mayor’s Permit Registrations, Value in Php Million**
- CAGR = 7.2% (2014-2018)
- Sources: DCIPC Compendium of Economic Indicators, 2014-2018

**Tourism, Construction**

**Tourist Arrivals**
- 2014: 1,529,907
- 2018: 2,393,384

**Construction Value, in Php M**
- 2014: 10,680
- 2018: 24,452

Sources: PSA, DCIPC
The state of Davao City’s major infrastructure...

**With progress comes heavy traffic in Davao**

**Limited capacity holds back Mindanao seaports**

**Davao airport already crowded, says biz leader**

**Transfer of Davao City terminal sought to ease downtown traffic**
Our infrastructure facilities need to keep up with the increasing population of the Davao Region and other key indicators.

- **6 Million** population of the Davao Region by 2040
- **18 Million** passengers through the Davao Airport by 2050 (DOTr projection)
- **5 Million** projected number of daily motorized trips by 2045
- **1.3 Million** TEUs container cargo in the Davao Gulf by 2050

Source: JICA I4M Davao, DOTr and Udenna studies
Public-Private Partnership on major infrastructure improvements to support Davao’s accelerating growth.
Davao City Land Transport Routes and Modes

- Approximately 126 routes served by PUJs, multi-cabs, and Filcabs
- Public transport modes largely unchanged since the ‘70s
1. Traffic congestion has gotten worse over the years

HIS Respondents' Assessment of Current Traffic Situation Compared to 5 Years Ago

<table>
<thead>
<tr>
<th>Traffic Impact</th>
<th>Much Worse</th>
<th>Worse</th>
<th>Slightly Worse</th>
<th>Same</th>
<th>Better</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
</tr>
<tr>
<td>Congestion</td>
<td>262</td>
<td>14.0</td>
<td>345</td>
<td>17.1</td>
<td>220</td>
<td>13.5</td>
</tr>
<tr>
<td>Safety</td>
<td>53</td>
<td>2.6</td>
<td>137</td>
<td>6.6</td>
<td>518</td>
<td>25.9</td>
</tr>
<tr>
<td>Convenience</td>
<td>111</td>
<td>5.5</td>
<td>151</td>
<td>7.5</td>
<td>601</td>
<td>29.8</td>
</tr>
<tr>
<td>Road Condition</td>
<td>116</td>
<td>5.8</td>
<td>213</td>
<td>10.6</td>
<td>532</td>
<td>26.4</td>
</tr>
<tr>
<td>Air Pollution</td>
<td>252</td>
<td>13.0</td>
<td>272</td>
<td>13.5</td>
<td>601</td>
<td>29.8</td>
</tr>
</tbody>
</table>


2. Increased car use is the major cause of congestion

Causes of Traffic Congestion According to HIS Respondents

<table>
<thead>
<tr>
<th>Cause</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased car use</td>
<td>538</td>
<td>25.1</td>
</tr>
<tr>
<td>Lack of traffic signals</td>
<td>192</td>
<td>9.0</td>
</tr>
<tr>
<td>Overlapping jeepney routes</td>
<td>240</td>
<td>10.0</td>
</tr>
<tr>
<td>Lack of roads or bad roads</td>
<td>198</td>
<td>9.2</td>
</tr>
<tr>
<td>Undisciplined driving manner</td>
<td>429</td>
<td>20.0</td>
</tr>
<tr>
<td>Insufficient public transportation</td>
<td>81</td>
<td>3.8</td>
</tr>
<tr>
<td>Lack of traffic management and enforcement</td>
<td>278</td>
<td>13.0</td>
</tr>
<tr>
<td>Other</td>
<td>17</td>
<td>0.8</td>
</tr>
</tbody>
</table>


3. Davaoeños prefer URBAN MASS TRANSIT as public transport service

HIS Respondents' Assessment of Traffic to Workplaces/Schools by Administrative District

<table>
<thead>
<tr>
<th>District</th>
<th>Very Bad</th>
<th>Bad</th>
<th>Average</th>
<th>Good</th>
<th>Very Good</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
</tr>
<tr>
<td>Poblacion</td>
<td>94</td>
<td>20.3</td>
<td>133</td>
<td>28.7</td>
<td>192</td>
<td>41.4</td>
</tr>
<tr>
<td>Talomo</td>
<td>32</td>
<td>22.9</td>
<td>67</td>
<td>47.9</td>
<td>38</td>
<td>27.1</td>
</tr>
<tr>
<td>Agdao</td>
<td>44</td>
<td>28.4</td>
<td>67</td>
<td>55.1</td>
<td>21</td>
<td>13.5</td>
</tr>
<tr>
<td>Bagaringan</td>
<td>22</td>
<td>12.3</td>
<td>16</td>
<td>39.9</td>
<td>89</td>
<td>48.7</td>
</tr>
<tr>
<td>Bunawan</td>
<td>17</td>
<td>16.8</td>
<td>20</td>
<td>19.8</td>
<td>56</td>
<td>56.4</td>
</tr>
<tr>
<td>Paquibato</td>
<td>1</td>
<td>1.6</td>
<td>6</td>
<td>9.8</td>
<td>34</td>
<td>55.7</td>
</tr>
<tr>
<td>Bagao</td>
<td>0</td>
<td>0.0</td>
<td>52</td>
<td>25.4</td>
<td>41</td>
<td>48.7</td>
</tr>
<tr>
<td>Calinan</td>
<td>30</td>
<td>11.6</td>
<td>50</td>
<td>19.4</td>
<td>103</td>
<td>39.9</td>
</tr>
<tr>
<td>Marilog</td>
<td>2</td>
<td>2.2</td>
<td>4</td>
<td>4.9</td>
<td>36</td>
<td>66.1</td>
</tr>
<tr>
<td>Tori</td>
<td>55</td>
<td>21.9</td>
<td>65</td>
<td>33.9</td>
<td>85</td>
<td>33.9</td>
</tr>
<tr>
<td>Tugbok</td>
<td>26</td>
<td>13.1</td>
<td>64</td>
<td>32.3</td>
<td>54</td>
<td>27.3</td>
</tr>
<tr>
<td>Total</td>
<td>123</td>
<td>16.8</td>
<td>614</td>
<td>30.5</td>
<td>785</td>
<td>39.0</td>
</tr>
</tbody>
</table>


Public Transport Services Preferred by HIS Respondents

<table>
<thead>
<tr>
<th>Public Transport Service</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jeepney</td>
<td>274</td>
<td>7.0</td>
</tr>
<tr>
<td>Ordinary Bus</td>
<td>219</td>
<td>5.6</td>
</tr>
<tr>
<td>Bus Rapid Transit</td>
<td>776</td>
<td>19.7</td>
</tr>
<tr>
<td><strong>Urban Railway</strong></td>
<td>1,496</td>
<td><strong>38.0</strong></td>
</tr>
<tr>
<td>Streetcar / On-street LRT</td>
<td>1,155</td>
<td>29.4</td>
</tr>
<tr>
<td>Ferry / Passenger Craft</td>
<td>14</td>
<td>0.4</td>
</tr>
</tbody>
</table>

*Respondents were asked to select three.*

Selection of Alignment and Station Locations

Obtain data derived from previous studies and available annual average daily traffic (AADT)

Traffic surveys

• Traffic volume count
• Trip generation
• Origin-Destination
• Stated preference
• Others

Assessment of alignment and right-of-way
Identification of potential station locations

Secondary data

Volume Counts (PT Only)

PT Passengers in Key Corridors
• 60% of the district population resides in this urban core
• Population density of 172 person/ha.
• 63% of the employed district population
• High daytime population

Mass Transit Alignment Based on Survey

- Length = 13.5 kms
- No of Stations = 15

The alignment is confirmed by the JICA-Infrastructure Modernization Plan for Davao City, Korean LRT Study and key trunk route of the ADB-assisted Public Transport Modernization Study

Challenges:
- Buhangin Grade Interchange
- Informal settlers at some potential stations
- Bankeroohan Bridge
- Arcaded buildings in some streets
- Proposed Maa Grade Interchange
Traffic Demand Forecast and Technology Selection

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Daily Ridership</th>
<th>PPHPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2025</td>
<td>147,285</td>
<td>4,662</td>
</tr>
<tr>
<td>2055</td>
<td>377,030</td>
<td>12,133</td>
</tr>
</tbody>
</table>

PPHPD – Passengers Per Hour Per Direction
Advantages of a Monorail

- Safe and reliable. Derailment is virtually impossible.
- Modular vehicles allow simplified capacity expansion.
- Can handle relatively steep gradients and sharp curves.
- Environment friendly – low noise and low pollution
- Elevated right of way promotes faster movement of people without impeding the traffic flow below
- Easy integration to the environment and existing infrastructure
- Minimal space requirements
- Modern look

Fast installation of guideway and minimal disruption during construction
Preliminary structural design conducted

Alignment Survey

Soil Investigations

Hydro Survey

Conceptual Design (Guideway, Pier and Foundation)

Hammerhead

Cantilever

Portal Type

@Bankeroohan River
Conceptual Design of the Stations
Project Information

Proponent: UD ENNA

PPP Scheme: Build, Transfer, Operate and Maintain

Concession Period: 35 years

Estimated Cost: C$ 955 Million

Objectives:
✓ Reduce traffic congestion in the urban center of Davao City
✓ Provide a modern, reliable, high-quality transit system interconnecting major focus points
✓ Ensure adequate, long-term, and sustainable transport system while supporting the current shift to cleaner sources of energy
### Comparative Advantages of a Monorail

<table>
<thead>
<tr>
<th></th>
<th>By Jeepney</th>
<th>By Taxi</th>
<th>By Monorail</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bangkal to SM Lanang</strong></td>
<td><strong>C$ 0.6 (with transfer)</strong>&lt;br&gt;Bangkal to Roxas&lt;br&gt;Roxas to SM Lanang</td>
<td><strong>C$ 5-6 (via Grab excluding booking fee)</strong></td>
<td><strong>C$ 0.65</strong></td>
</tr>
<tr>
<td><strong>Fare</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Travel Time</strong></td>
<td><strong>1 to 1.5 hours</strong>&lt;br&gt;(2016 cost of Time=PhP12/hour)</td>
<td><strong>45 minutes to 1.5 hours</strong></td>
<td><strong>&lt;30 minutes</strong></td>
</tr>
</tbody>
</table>

**With the Monorail, WE CAN...**

- **Improve Air quality**  (less cars, less air pollution)
- **Increase productivity** (less time spent on the road, more time for work and family)
- **Enhance security**   (modern security technologies, good lighting, CCTVs, etc)
- **Provide convenience for women, PWD, senior citizens**  (design elements will ensure accessibility, safety, convenience for all)

**Better quality of life for all**
Estimated Project Cost: **C$ 869 Million**

**Revenue Sources:**
- Farebox
- Commercial and advertisement revenues

**Project IRR:** 10%

**Benefits of other transport users (Vehicle Operating Cost Savings)**

**Economic Benefits**
- **Indicator:**
  - **NPV (at 10%)** = 20.5 B PhP
  - **EIRR = 19.84%**
  - **BCR = 2.88**

**To be economically viable:**
- **EIRR > 10%, the Social Discount Rate set by NEDA**
- **ENPV > 0, discounted using Social Discount Rate**
- **BCR > 1.0**
BT-OM Framework

GOP

OM Component

BT Component

Proponent


gets farebox
• Operate and Maintain
• Pays taxes to GOP

Builds the System

• Awards construction of system to Concessionaire
• Payment of fixed Amortization Payment over a 10-year period (Cost of Project)

Proponent

• Awards operations and maintenance to proponent/O&M entity
• Retains regulatory powers on fares
Conceptual Visualization of the Davao People Mover
Feeder and Trunk System

Secondary / Tertiary Networks

- Tricycles
- Jeepneys
- Small buses

Primary Network

MONORAIL

Express connections / Backbone of public transport network: Monorail

Feeder lines and Connectors: Bus

Dense areas not influenced by Monorail

Major multimodal hubs: P+R, Services & Accomodations etc.

Outlying areas serving: railways, bus, jeepneys

Urban and local developments due to the proximity of the multimodal hub

Bus (HPBS) ←→ Urban rail
Visualization of the Bus-Monorail Complementation

Along Pichon St (2x2 road)

Along CM Recto Avenue (2x2 road)
Visualization of the Bus-Monorail Complementation

Along McArthur Highway

With median

Without median
Unsolicited Proposal submitted by Udenna
Submitted in 2018

Granted in 2018
Original Proponent Status conferred by DOTr

NEDA Approval
January 2020

February 2020
Swiss Challenge

Project Award
Q2 2020

2020
DED and Construction
The Monorail and Other Land Transport Developments

Davao Monorail, Line 1
Davao Monorail, Line 2 (FS Ongoing)
Davao Monorail, Medium-term Extensions
Davao Bypass Road
Davao Coastal Road
Mindanao Railway System
Davao City Expressway

Bus shuttle connection to MRS
THE DAVAO INTERMODAL TRANSPORT HUB (DITH)

- Connecting, air, land, sea, and rail travel.
- The first truly intermodal terminal in the Philippines.
Proponent: Udenna Infrastructure
PPP Scheme: Management Contract
Type of Buildings: Integrated Transport Terminal with Commercial Facilities
Concession Period: 50 years
Estimated Cost: C$ 235 Million
Implementation Schedule:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start of Construction</td>
<td>2020</td>
</tr>
<tr>
<td>Construction Period</td>
<td>2-3 years</td>
</tr>
<tr>
<td>End of Construction</td>
<td>2022</td>
</tr>
<tr>
<td>Start of Operation</td>
<td>2023</td>
</tr>
<tr>
<td>Concession term</td>
<td>50 years</td>
</tr>
</tbody>
</table>
**Proponent:** Chelsea Logistics and Infra Holdings Corp  
**PPP Scheme:** Operate, Add & Transfer  
**Concession Period:** 30 years  
**Estimated Cost:** C$ 939 Million  
**Implementation Schedule:**

<table>
<thead>
<tr>
<th>Start of Construction</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Period</td>
<td>3 years (Ph1)</td>
</tr>
<tr>
<td>Start of Operation</td>
<td>2020</td>
</tr>
<tr>
<td>Concession term</td>
<td>30 years</td>
</tr>
</tbody>
</table>

**Target:** Capacity augmentation to handle up to 16 million passengers by 2050

**Indicative Developments:**
1. New parallel taxiway  
2. Reconfiguration and expansion of the Passenger Terminal Building  
3. Landside and airside improvements  
4. New airport technologies to enhance passenger comfort and experience
Davao (Sasa) Port Modernization

Enhancing Davao’s competitiveness

New 600m container berth that can accommodate post-panamax vessels
Installation of STS cranes and other modern port eqpt
New container yards and more ground slots
Enhanced port flow and traffic management systems
Application of new systems to increase operational efficiencies

Proponent: Chelsea Logistics and Infra Holdings Corp
PPP Scheme: JV with PPA
Concession Period: 25 years
Estimated Cost: C$ 654 Million

Implementation Schedule:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Start of Construction</td>
<td>2020</td>
</tr>
<tr>
<td>Construction Period</td>
<td>2 years</td>
</tr>
<tr>
<td>End of Construction</td>
<td>2022</td>
</tr>
<tr>
<td>Start of Operation</td>
<td>2020</td>
</tr>
<tr>
<td>Concession term</td>
<td>25 years</td>
</tr>
</tbody>
</table>
UIC's Current Project Portfolio

PPP Projects in the Pipeline

- Davao Bus Project
- Metro Manila BRT
- Metro Cebu BRT
- Metro Manila Urban Rails
- Waste-to-Energy
- Smart City
- Toll Road
- Other transport, ICT and energy projects

Note: Costs are based on conceptual designs and are subject to change as a result of detailed engineering.
Let us, **TOGETHER**, invest in

![DAVAO](image1)

**LIFE IS HERE**

![INVEST Philippines](image2)

**Your Business. Our People.**

![UDENNA INFRA](image3)

www.udenna.ph

Thank you.