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CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

REPORT TO THE EXECUTIVE MAYOR

LC17968

1. ITEM NUMBER

2. SUBJECT

FEEDBACK ON THE INTERNATIONAL TRIP UNDERTAKEN FROM 1 MARCH 2017 TO 11 MARCH 2017 TO UNDERTAKE IN-PRODUCTION ELECTRIC-BUS INSPECTIONS AND TRAINING IN SHENZHEN, CHINA.

3. EVENT SUMMARY

EVENT DETAILS	
CONFERENCE/SEMINAR	N.A.
OTHER	To undertake in-production inspection of prototype chassis of electic buses being procudered under Contract 238G as well as undertake training, abd clarify isues pertaing to depot charging installation requirements.
DATE	1 to 11 March 2017 (including travelling)
VENUE	Head Office of BYD, China. (No. 3009, BYD Road, Pingshan
CITY	Shenzhen, Guangdong Province
COUNTRY	China

City Manager's Office
0 3 APR 2017
Name: NCUMISA
Signature: 9:10

NW
9:10

ATTENDEE DETAILS	
NAME AND SURNAME	DESIGNATION
John Martheze	Manager: Network Integration
James Groep	Manager: Fleet And Asset Management

PROVIDE SUMMARY OF HOST ORGANISATION / CITY

BYD Co Ltd is a Chinese manufacturer of automobiles and rechargeable batteries with its corporate headquarters in Shenzhen. It has two major subsidiaries, BYD Automobile and BYD Electronic. Hailed for its innovations, BYD has grown to become a major manufacturer of rechargeable batteries, most notably mobile phone batteries, as well as battery powered electric cars and battery powered electric buses.

BYD Auto Co., Ltd. a wholly owned subsidiary of BYD Company principal activity is the design, development, manufacture and distribution of passenger cars and buses sold under the BYD brand.

BYD SA (Pty) Ltd a subsidiary of BYD Co Ltd has been contracted to supply its battery electric bus to the City of Cape Town,

BYD hosted the City officials at their corporate headquarters to conduct in-production inspections of the prototype buses being supplied to the City and undertake training related to the electric bus type.

4. OBJECTIVE

Contract 238G/2015/2015 for the supply of battery powered electric buses, ancillary equipment and services was awarded to BYD SA (Pty) Ltd. As a major / key components of the buses are to be manufactured at BYD's facilities in Shenzhen, China, an in-production inspection and on-site product induction training/familiarization was deemed essential before these components were shipped to South Africa for final assemble.

Multiple objectives were sought as the electric bus technology (e.g. batteries, management systems, electric drive motors and charging systems) are relatively new technologies that have not previously been applied in the City of Cape Town nor in the South African bus industry as a whole.

1. As a quality assurance measure and for purpose of product familiarization, an in-production factory inspection of the chassis and power train prototype components was to be undertaken before the production components are shipped to the local assembly facility in Blackheath, Cape Town.

2. Given the availability of BYD technical staff, specific product training and the transfer of technical knowledge regarding the product as well operational aspects was sought.

3. To undertake a visit to local operators of electric buses to evaluate their respective maintenance and bus charging operations and facilities.

4. While in Shenzhen an opportunity to obtain information on BYD's Shenzhen Sky-Rail (monorail) will be sought. This is in response to a follow up action emanating from the Mayor's attendance at the C40 Mayor's Summit in Mexico City (Nov – Dec 2016) where an invitation was received from the "*Chairman of BYD, Mr Wang Chuanfu to visit a BYD bus, battery and Skyrail factory to see how Skyrail is manufactured and how it works and to discuss further possibilities of co-operation between the City and BYD.*"

5. A meeting with the Hong Kong Transport Authority is being arranged through the offices of BYD with the intention of discussing the Authority's successful transport orientated development (TOD) program and their well-integrated "seamless" transport system with the intent of bring "lessons learnt" back to the City.

5. OUTCOMES

☐ - Partnership Agreement
☐ - Membership Agreement
☐ - Grants Agreement
☐ - Memorandum of Understanding
☐ - Statement of Intent
☒ - Other *(refer to Section 6 below for detail)*

6. ACTIONS REQUIRED

1. In-production factory inspections.

   The inspection of the two prototype chassis and associated production facilities revealed a build quality and quality assurance system which indicated high level quality standards were being attained and no specific concerns were identified.

   From information gathered on-site our standard bus acceptance checklist (prepared for previous bus procurement contracts) will be updated to make provision for the battery and associated management systems. Similarly, checklists for the charging stations are to be developed. Further the

approval and final acceptance processes for all third party equipment installations will be updated to accommodate the new technology being introduced. Product induction training of the City's QA staff as well as sub-contractors will be required prior to their commencing of in-production inspections at the Blackheath assembly plant.

The above will be done under the auspices of the Contract.

2. Training and the transfer of technical knowledge

   Product / induction training was accomplished and exposure to key components of the bus's energy and drive-train systems were beneficial.
   It is evident that training of EMS staff (City wide) in addition maintenance staff and operators will be required prior to the commencement of operations. In addition of "emergency cards" and signs will need to be installed on each vehicle, warning of the high voltage system and how to deal with such in emergency situations.

3. Bus charging operations and facilities

   Valuable insight was obtained regarding the installation of charging equipment following discussions with BYD technical staff and a visit to an e-bus operator's depot facilities. The charging system's data management system was demonstrated using real-time data from a bus depot in Waterloo, London.

   A charging station data management system will be installed at the City's facilities, providing real time data on the charging of bus i.e. bus and charging unit's id, state of charge (SOC), depth of discharge(DOD), power consumption (KWh) etc. In addition, the system will allow for the balancing of energy demand at depots, thus reducing peak power demand.
   Together with the vehicle telematics systems which will provide on-route bus information, the City's fleet section will be able to accurately monitor charging system, bus and battery performance at any time. Thus enabling the optimal deployment of the electric bus systems

   The data received via these systems will provide adequate information for the comparison with other bus fuel / power systems allowing a robust assessment and evaluation of the performance of the pilot electric bus fleet i.e. route specify energy demand per vehicle will be able to be determined.

4. BYD's Sky-Rail (monorail)

   An opportunity to travel on BYD Skyrail (monorail) was provided as well as a visit to the on-site beam (rail) manufacturing plant. The BYD monorail is essentially a test-bed / demonstrator system with two rails permitting shuttle services between two stations +/- 500m apart. The system is currently being extended across the BYD complex. Some basic information

regarding the system was also provided. The advantages and disadvantages of such systems have been well documented and no intrinsic benefits over and above other modern monorail systems were evident.

Given that there is some interest in the possibility of a monorail system in the City's environs it is suggested that a pre-feasibility assessment be undertaken to examine the potential for such a system as a passenger transit option and its comparative strengths and weakness in relation to BRT and light rail systems as alternates.

5. Meeting with Transport Authority / transport orientated development (TOD)

Unfortunately, due to their commitments the planned meeting with the Hong Kong Transport Authority could not take place. However, a meeting with the Shenzhen Metro Group Co. Ltd (SZMC) was arranged by BYD where presentations on the Shenzhen metro system and their TOD developments were received. SZMC was represented by a senior delegation including their Minister of Capital Operations Department, the Deputy General Manager of their Property Development Branch and senior managers from the projects, design and finance divisions. Following the presentations fruitful discussion on their projects were held. This meeting was a prelude to a further meeting between SZMC and BYD, who arranged the meeting on our behalf.

The key factors for successful TOD implementation as identified by SZMC where given as;

A. Concept
   - Build the metro to develop the City – i.e. not a transport solution but a developmental tool

B. Plan to capture opportunities
   - Plan land use development and transport provision to maximize

C. Innovation in the following areas (lead by government)
   - Policy
   - Legal
   - Technical

D. Be open minded and welcome co-operation
   - Cooperate with other developers to get the best assistance / inputs

E. Government support for the above

SZMC also advised that they have embarked on a step by step approach to move into the international sphere. They currently operate two light rail

systems in Tanzania and provided services in Ethiopia, Egypt and Israel (extent not clear). The three basic steps they are following are broadly;

Step 1. The provision of consultancy services; there is interest from African countries for services; SZMC are also exploring opportunities for investment.

Step 2 – Assist clients with development proposals but no guarantees to completed systems/developments. They see this as a tool to understand their client's legal system, cultural, political and socio-economic factors before investing.

Step 3 – direct investment in projects being the final step.

A separate report is being prepared for departmental use.

6. Xiamen City BRT System

Over the weekend of the 4 to 5 March 2017 John Martheze[1] was given the opportunity to travel to Xiamen City to experience the BRT system. Particular attention was paid to their buses and stations, in particular station docking and relevant information will be disseminated to TDA planning and design staff.

7. IMPLICATIONS

7.1	**Constitutional and Policy Implications**	No ☒	Yes ☐
7.2	**Environmental implications**	No ☒	Yes ☐
7.3	**Financial Implications**	No ☒	Yes ☐
7.4	**Legal Implications**	No ☒	Yes ☐
7.5	**Staff Implications**	No ☒	Yes ☐
7.6	**Risk Implications**	No ☒	Yes ☐

[1] Unfortunately, James Groep was unwell and could not accompany John Martheze to Xiamen City.

8. OTHER SERVICES CONSULTED

Not applicable

9. RECOMMENDATIONS

It be NOTED that:

9.1 The actions identified in Section 5 of this report will, where required, be implemented under the auspices of Contract 238G and/or through the ongoing and direct interaction with line functionaries within the Transport and Urban Development Authority.

10. GENERAL DISCUSSION

Contract 238G/2015/2015 for the procurement of electric buses, ancillary equipment and services was awarded to BYD SA (Pty) Ltd. Major components of the bus chassis including the drive and power trains will be manufactured at BYD's factory facilities in Shenzhen, China before being shipped to South Africa for assembly, together with its locally manufactured body components.

The visit to the BYD facilities, an electric bus operator's depot, discussions with Shenzhen Metro Company regarding their TOD projects, a visit to the Ximan City to experience their BRT system and to view BYD's "Skyrail" project proved invaluable in terms of the City's electric bus project as well as in the delegates exposure to allied fields in the transportation sector.

The key purpose of the visit, the inspection of the two prototype chassis and associated production facilities revealed a build quality and a quality assurance system of a high standard and no specific concerns were identified.

The potential risks associated with the introduction of innovative new technologies to the City are mitigated through the inspections and training offered to the key personal, as contractually stipulated. This will ensure that the quality standards are maintained during the local assembly process; and that ongoing operation and maintenance of the buses will be performed correctly. Further, the information gathered will be of benefit with any revision and updating of the City's functional specifications for MyCiTi electric buses

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11. ANNEXURES

None

FOR FURTHER DETAILS CONTACT:

NAME	John Martheze
CONTACT NUMBERS	021 4009140
E-MAIL ADDRESS	John.martheze@capetown.gov.za
DIRECTORATE	Transport and Urban Development Authority
FILE REF NO	
SIGNATURE	

COMMENT:

COMMISSIONER: TRANSPORT AND URBAN DEVELOPMENT AUTHORITY

NAME Melissa Whitehead.

DATE 29/3/2017

MANAGER INTERNATIONAL RELATIONS
DR. DENVER VAN SCHALKWYK

COMMENT:

NOTED

DATE 3/04/2017

CITY MANAGER

ACHMAT EBRAHIM

☑ SUPPORTED FOR ONWARD SUBMISSION TO MAYOR ☑ / MAYCO ☐ / COUNCIL ☐

☐ NOT SUPPORTED

DATE 03.04.2017

☐ REFERRED BACK

COMMENT:

LEGAL COMPLIANCE

☐ REPORT COMPLIANT WITH THE PROVISIONS OF COUNCIL'S DELEGATIONS, POLICIES, BY-LAWS AND ALL LEGISLATION RELATING TO THE MATTER UNDER CONSIDERATION.

☐ NON-COMPLIANT

NAME Ncumisa Willie

TEL 021 400 1265

DATE 07 April 2017

COMMENT: For Information

MAYORAL COMMITTEE MEMBER

NAME BRETT HERRON

DATE 12/04/2017

COMMENT: Please action for monorail feasibility Study.

EXECUTIVE MAYOR (ACTING)

~~PATRICIA DE LILLE~~ IAN NEILSON

☐ SUPPORTED FOR ONWARD SUBMISSION TO MAYCO ☐ / COUNCIL ☐:

- ☐ PC RECOMMENDATION
- ☐ RECOMMENDATION AS CONTAINED IN ORIGINAL REPORT
- ☐ ALTERNATIVE RECOMMENDATION TO BE REFLECTED BELOW

☑ APPROVED I.T.O. DELEGATED AUTHORITY

☐ NOTED

☐ REFUSED

DATE 13/4/2017

☐ REFERRED BACK