dost digest
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Making science work for you

Inside

Moving people. Composed of up to five interconnected coaches with a carrying capacity of 120 people for eache coach, the DOST Road Train is envisioned to compliment existing public transport system. *(Photo by DOST-SPP/Text by George Robert E. Valencia III, S&T Media Service, DOST-STII)*

DOST's Project NOAH and TV White Spaces bag FutureGov Awards

FutureGov, Asia's longest running and multi-awarded magazine for government, healthcare and education, recognized the Department of Science and Technology (DOST)'s two banner projects for their contributions in driving the country towards sustainable development.

Said two projects, the Nationwide Operational Assessment of Hazards (NOAH) and TV White Spaces Technology, gained FutureGov's nod along with eight other top picks for "helping push the successful modernization in government, education and healthcare organizations in Asia-Pacific region."

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DOST chief pitches new transport solutions

By George Robert E. Valencia III
S&T Media Service, *DOST-STII*

Department of Science and Technology (DOST) Secretary Mario G. Montejo today announced DOST's new transport projects—the Road Train and the remodeling of the Philippine National Railway (PNR)'s idle trains—as part of DOST's Advanced Transport Program. Sec. Montejo introduced the new projects during the demonstration run of the Automated Guideway Transit (AGT) with President Benigno S. Aquino III at the AGT Test Site in the University of the Philippines (UP) Diliman.

The "Road Train" is a long people mover composed of up to five interconnected coaches traveling on rubber tires similar to normal vehicles. It is designed to run on major highways like EDSA to complement the city's existing commuter traffic system. Although the Road Train's functions are similar to tramways in other countries, it is mainly powered by a hybrid diesel-electric system, hence, it is not dependent on electricity and will not require the usual suspended cables used in trams.

The Road Train will also have a wide, fully air-conditioned interior that can carry up 120 passengers per coach. A new Road Train System can accommodate up to more than 650,000 passenger trips per day of operation if fully implemented, according to Secretary Montejo.

"[The Road Train] simply harnesses [railway] trains' effectiveness in moving people and applies this principle to road transport," he explained.

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In addition, the DOST chief announced a partnership with PNR last year to retrofit 40 idle trains donated by the Japanese Government. DOST engineers are now remodeling the coaches' bogies and also overhauling their power systems to reactivate the trains and also make them suited for PNR tracks.

Both transport projects are scheduled to produce prototypes by the end of 2013.

Meanwhile, the AGT is considered the first Filipino-developed train. Its prototype in UP Diliman is being developed into a fully-automated or driverless people mover by DOST in consultation with UP experts. The elevated, electrically driven train came two years after President Aquino announced a research and development (R&D) collaboration between the DOST and UP to produce "a new train system" during his 2011 State of the Nation Address.

AGT's bigger, regular version in Bicutan, Taguig City is also scheduled for completion by year-end, said the DOST chief.

"This AGT (in UP) is still a light version of the intended mass transport. The regular version is comparable to our present rail systems MRT and LRT, capable of carrying up to 120 passengers from 30 per coach," he said.

"True to the vision, our development of the AGT has produced two new advanced transportation systems that can solve our vehicular traffic problems," said Secretary Montejo.

DOST Undersecretary Louis Napoleon Casambre, head of the Information and Communications Technology Office (ICTO), receives the Best Mobile Application award for Project NOAH (short for Nationwide Operational Assessment of Hazards) and Technology Leadership Award for ICTO's TV White Spaces Project in the recent FutureGov Awards Philippines held at New World Hotel, Makati City. Project NOAH was recognized for its major role in providing information relevant to weather conditions and disaster preparedness. According to FutureGov Magazine managing editor Mohit Sagar this project has "the greatest potential transformative impact of any of the projects surveyed." *(Photo from FutureGov)*

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Project NOAH's mobile application was adjudged as the best in this category for enabling Filipinos to get information relevant to weather conditions and disaster preparedness on the palm of their hands, thereby saving lives and potential economic loss.

"When it comes to accessing real-time information, there is nothing more ubiquitous than a mobile phone. In the wake of natural calamities, new ways of using mobile devices has paved the way for governments and communities to streamline and improve their search and rescue and disaster prevention efforts," James Smith, managing editor of FutureGov magazine and chairman of judging panel, said.

Project NOAH is DOST's response to step up national efforts toward greater and more intensive disaster risk reduction and management procedures in the country. Meanwhile, TV White Spaces Project, another DOST project through its Information and Communication Technology Office (ICTO), received the Technology Leadership Award.

"Leadership is about setting a path for others to follow-and the FutureGov Technology Leadership Award recognizes ICTO-DOST for the scope and underlying vision of the TV White Spaces project," Smith said.

DOST's TV White Space Projects is DOST-ICTO's initiative to deploy new wireless data communication standards, such as the unused TV channels in UHF and VHF bands. Apart from providing Internet access to rural communities, TV White Space technologies can also be used to support government projects requiring data connectivity.

Other recipients of FutureGov Awards include the Department of Budget and Management as Government Organization of the Year, Juan Evangelista of Government Service Insurance System (GSIS) as CIO of the Year, Revenue Administration Reform Project of Bureau of Internal Revenue for Service Innovation, Personally Controlled Health Records of Philippine Health Insurance Corporation for E-Government, Philippine Geoportal of National Mapping Agency for Information Management, Department of National Defense for Information Security and Makati City Hall for Data Center.

The awardees were selected by FutureGov Magazine's editorial team, who are acknowledged experts in the development of e-commerce in the region. The awarding ceremony was held recently at the close of the annual FutureGov Forum Philippines at the New World Hotel in Makati City.

FutureGov Awards Philippines highlighted the commitment and hard work of the country's public sector to deliver more reliable and efficient services to its constituents.

About us

The DOST Digest is published by the
Science and Technology Information Institute-
Department of Science and Technology
For comments, suggestions or queries,
contact: (02) 837-2071 loc. 2148/839-2193
local 107 or email:
dost.digest@gmail.com

Framelia V. Anonas
Editor-In-Chief

Joy M. Lazcano
Managing Editor

James B. Intia
Layout

Ma. Luisa S. Lumioan
Proofreader

Science and Technology Information Institute-
Department of Science and Technology
Bicutan, Taguig City, Metro Mla.1631
Philippines

www.stii.dost.gov.ph

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DOST, UP conducts demo run of first PH-made elevated train

PNoy among those onboard

By George Robert Valencia III
S&T Media Service, *DOST-STII*

President Aquino and DOST Secretary Montejo alight the AGT platform shortly after riding the elevated train. The DOST chief acquainted the President about the train's specifications and features during the ride. *(Photo by Henry A. De Leon/Text by George Robert E. Valencia III, S&T Media Service, DOST-STII)*

The Philippines moves a step closer to the realization of a new, locally developed and fully automated transport system as President Benigno Simeon Aquino III boards the Automated Guideway Transit or AGT to test run the elevated train at its testing site at the University of the Philippines (UP) Diliman.

A flagship project of the Department of Science and Technology (DOST) under the leadership of Secretary Mario G. Montejo in collaboration with UP, the prototype AGT is an elevated train capable of transporting up to 60 passengers from station to station. The train is emission-free as it is electrically driven,similar to AGTs and other elevated carriers in other countries and the rail transit systems in Metro Manila.

"Not only can [the AGT] help ease traffic congestion in many urban areas, but also developing our own version costs less than buying a train from abroad. That is why we recommend the AGT especially to the already urbanized LGUs. Upon perfecting the system, we can easily replicate the AGT and modify it according to our local needs—its materials are all locally available. We also contribute to the development of Filipino capabilities in transportation technology,"Sec. Montejo said, summing up the benefits of AGT.

The current train is a light version of the intended final product - a "driverless" people mover. A bigger or full-sized version is to be built soon, based on results from the current testing.

"This is a continuing R & D effort. Our goal is to perfect a localized version of a mass transit system," Sec. Montejo stressed.

DOST successfully completed the AGT's main components in November 2012, composed of the 465-meter concrete elevated track in UP Diliman, rolling stocks or main mechanical frameworks, coaches or cars, and power system or controls.

Upon completion, the AGT will be "driverless" and may be built within central business districts or serve as a link between the city's main airports.

"It's early to say as we're still testing, but one thing is clear—local technology works", the DOST Secretary declared.

Bacteria may help address water pollution

By Ma.Luisa S. Lumioan
S&T Media Service, *DOST-STII*

Certain types of bacteria may help in waste water cleanup, according to a Department of Science and Technology funded study.

The team headed by Prof. Arlene Llamado of the University of the Philippines Los Baños isolated five bacteria cultures from soils of an abandoned mine site in Mogpog,Marinduque to determine if these can form biofilms. Then the team assessed the bacteria's potential in wastewater treatment applications.

Biofilms are the slimy substances secreted by certain types of bacteria, just like the slime on un-brushed teeth or the film on top of left-over soup. In hospital settings,biofilm-forming bacteria are notorious in spreading hospital-acquired infections because they are resistant to antibiotics and cleaning agents.

However, the researchers wanted to take advantage of the ability of microorganisms to form biofilms because they are negatively charged therefore they can attach to positively charged metal ions.

"By the simple idea of negatively charged polymers attaching to positively charged ions, we actually have a potential to remove heavy metal ions from waste water," explained Prof. Llamado.

She further explained that they collected samples from a mined out site where there is low concentration of organic elements and high concentration of copper, because they expected that bacteria living in these soils would have resistance to heavy metals.

All of the bacteria samples isolated from the site exhibited ability to produce biofilms. Further evaluation showed that all of these isolates were capable of removing heavy metals in water-copper solution. The planktonic cells of each bacterial isolate ate up the copper within six hours of contact time.

Since actual wastewaters may contain multiple metals, the team also tested the isolates in mixed metal solution containing copper, cadmium, lead, and zinc. Results revealed that three out of the five isolatesdecreased their efficiency in removing copper when exposed to mixed metal solution. Interestingly, one of the isolates called NV17 has shown dramatic increase in its ability to remove copper in multi-metal solution.However, Professor Llamado said that the reason for this occurrencewas not yet tackled in the study.

Subsequent analysis of the bacteria revealed that the isolates NV112 an NV1A are species of Rhodococcus; NV17 and R11 are species of Bacillus, and NV2A is Pseudomonas sp.

Prof. Llamadorevealed that further study is underway to test the ability of these bacterial isolates in removing metals in actual wastewater.

DOST experts develop green packaging thru nanotech

By Luisa S. Lumioan
S&T Media Service, *DOST-STII*

A team of scientists at the Department of Science and Technology-Industrial Technology Development Institute (DOST-ITDI)led by Dr. Blessie A. Basilia has come up with a biodegradable food packaging material that protects food and extends its shelf while being kind to the environment. This is made possible, according to Dr. Basilia, via the science called nanotechnology in which things are structured at the atomic and molecular levels.

The biodegradable film is made from starch and clay, both locally available materials, said Basilia who is chief of ITDI's Material Sciences Division.

Clay comes in layers tightly held together, so it is processed first so that it can blend effectively with starch. In Basilia's work, clay is treated with ions in a process called ion exchange which results in wider spaces between the layers of the clay. This treated clay is called organoclay or nanoclay, its commercial name.

Nanoclay is blended with thermoplastic starch made from cornstarch to help increase the latter's strength. The clay-plastic blend goes through the same process and equipment in making petroleum-based plastics.

The resulting product passed the migration test required for packaging films which means that the materials in the product will not contaminate the food it is in contact with.

Biodegradable packaging and cutleries made from starch-clay can help address pollution brought about by petroleum-based plastics. *(Photo courtesy of DOST-ITDI)*

Plastic food packaging protects and extends shelf life of food and offers convenience to consumers. However, plastics are not biodegradable and pose harm to the environment. When disposed of indiscriminately, plastics clog waterways and contribute to flooding. Plastics that find their way to oceans cause serious harm to marine wildlife which mistake them for food.

Thus this DOST-developed green packaging technology will not only help address the disposal of food packaging wastes but will also benefit the packaging and plastic industries in the country.

Nanotechnology is one of DOST's priority among emerging technologies through its sectoral council Philippine Council for Industry, Energy and Emerging Technology Research and Development which funded and monitored the project.

INFOcus

Flavored Salted Eggs as Best Utility Model. The salted egg industry may be in for a heavy boost with the utility model developed by Veronica Pasion (2nd from left) of Occidental Mindoro State College, shown here receiving a Certificate of Recognition from Department of Science and Technology (DOST) -MIMAROPA Regional Director Dr. Josefina P. Abilay. Pasion's pioneering multi-flavored salted egg products were judged Most Outstanding Utility Model during the 2nd Regional Invention Contest and Exhibits (RICE) - MIMAROPA held in Calapan City, Oriental Mindoro from April 16-17, 2013. Developed using brine mixtures of herbs, spices, and various flavors, the eggs are delicious, hygienic, and free from artificial coloring, Also in photoareDOST-Oriental Mindoro Provincial Science and Technology Director Jesse Pine (far left) and Technology Application and Promotion Institute (TAPI) Invention Development Division Chief Dr. George M. Colorado (far right) among others. TAPI is an attached agency of DOST. *(Text by Angelica A. de Leon, Photo by Gerry Palad, S&T Media Service, DOST-STII)*