

For discussion
on 21 June 2016

**Legislative Council
Panel on Commerce and Industry**

**Progress Report on Research & Development (“R&D”) Centres
for 2015-16**

PURPOSE

This paper provides an annual update on the 2015-16 operation of the five R&D Centres under the purview of the Innovation and Technology Commission (“ITC”).

BACKGROUND

2. In April 2006, the Government set up five R&D Centres to drive and co-ordinate applied R&D in selected focus areas. The five Centres are –

- (a) R&D Centre for Information and Communications Technologies under the Hong Kong Applied Science and Technology Research Institute (“ASTRI”);
- (b) Nano and Advanced Materials Institute (“NAMI”);
- (c) Hong Kong R&D Centre for Logistics and Supply Chain Management Enabling Technologies (“LSCM”);
- (d) Hong Kong Research Institute of Textiles and Apparel (“HKRITA”); and
- (e) Automotive Parts and Accessory Systems R&D Centre (“APAS”).

3. In December 2015, the Finance Committee (“FC”) approved an additional allocation of \$677.6 million from the Innovation and Technology Fund (“ITF”) to support the operation of the R&D Centres (except the operating expenditure of ASTRI since it is met separately from Government’s annual recurrent subvention) up to 31 March 2021. Since 2006, a total commitment of \$1,696.6 million has been approved to fund the operation of the four R&D Centres.

4. The Innovation and Technology Bureau (“ITB”) was established on 20 November 2015, and is responsible for formulating I&T policies, thereby fostering the development of innovation and technology (“I&T”) and related industries in Hong Kong. Having considered Hong Kong’s unique advantages, and I&T development globally, the ITB has set nine directions and work priorities, including –

- (a) Promoting R&D collaboration;
- (b) Promoting “re-industrialisation”;
- (c) Promoting investment on technology start-ups;
- (d) Studying the Smart City initiative;
- (e) Building Hong Kong into a Wi-Fi connected city;
- (f) Promoting the adoption of I&T in addressing social issues;
- (g) Promoting the use of local technology products and services;
- (h) Augmenting the pool of I&T talents; and
- (i) Encouraging the collaboration among institutions.

5. The ITB is committed to creating a thriving I&T ecosystem. The R&D Centres play an important role in this regard. The R&D Centres not only contribute to the applied research in key areas, their work and R&D results also help to promote I&T development. The R&D Centres work closely with the industry, thereby encouraging investment in R&D, promoting applied research and driving the commercialisation of R&D results. Through active participation in the Public Sector Trial Scheme (“PSTS”), the R&D Centres also promote the adoption of local technology products and services. Throughout the years, the R&D Centres have nurtured a lot of research talents and received a number of international awards, making great contribution in consolidating the capabilities of local scientific research teams.

6. Co-operation with the Mainland in the context of I&T development is an important direction that will open up lots of opportunities for Hong Kong’s technology development. The Dedicated Chapter of the 13th Five-Year Plan expresses clear support for the Mainland and Hong Kong to develop co-operation in I&T, for Hong Kong’s micro, small and medium enterprises and young people to develop businesses in the Mainland, and for Hong Kong to develop the I&T industry and nurture emerging industries. The ITB will continue to deepen Hong Kong’s cooperation with the Mainland and overseas on I&T, demonstrating Hong Kong’s strength as the “super-connector” for Hong Kong, the Mainland and the rest of the world. This will also be an important area of work of the R&D Centres.

WORK OF R&D CENTRES IN 2015-16

7. R&D Centres form an important part of our technology infrastructure. Information on the work of the R&D Centres are presented at **Annex A** to **Annex E**.

Operating Expenditure

8. The operating expenditure of the R&D Centres in 2015-16 (figures of 2014-15 are provided for comparison purpose) and their staffing situation (as at end-March 2016) are summarised as follows –

Table 1: Operating Expenditure and Number of Staff

	(\$ million)		% change	Number of Staff as at End-March 2016
	2014-15	2015-16		
ASTRI	123.0	145.8	+19%	499
NAMI	53.6	54.3	+1%	197
LSCM	24.8	25.1	+1%	66
HKRITA	24.1	29.6	+23%	39
APAS	13.8	15.8	+14%	30

9. In 2015-16, the operating expenditure(s) of –
- (a) ASTRI has increased by 19%, since it has incurred additional relocation expenditure for office consolidation in a single building in the Hong Kong Science Park;
 - (b) NAMI and LSCM are both largely similar to that of 2014-15;
 - (c) HKRITA has increased by 23%, mainly due to the engagement of more in-house researchers; and
 - (d) APAS has increased by 14%, since it has strengthened its R&D team by filling some vacant R&D positions.

Level of Industry Contribution Achieved

10. R&D Centres are platforms for coordinating applied research in designated technology areas and facilitating technology transfer to the industry, and as such the level of industry contribution is one of the most important indicators to show the degree of support of the industry in their work.

11. The performance of the R&D Centres in 2015-16 as compared with 2014-15 is summarised as follows –

Table 2: Level of Industry Contribution ^(Note)

	2014-15	2015-16	Difference (Percentage Point)
ASTRI	21.6%	21.7%	+0.1
NAMI	23.2%	28.9%	+5.7
LSCM	31.4%	23.5%	-7.9
HKRITA	28.6%	34.4%	+5.8
APAS	35.2%	42.5%	+7.3

Note : The level of industry contribution is calculated as follows –

$$\frac{\text{Industry Contribution Pledged}}{\text{Approved Project Expenditure}} \times 100\%$$

12. In 2015-16, the performance, in terms of level of industry contribution, of –

- (a) ASTRI is largely similar to that of 2014-15;
- (b) NAMI's performance has improved by 5.7 percentage points since it has initiated a number of market driven research projects;
- (c) LSCM has reported 7.9 percentage points less, partly because it has commenced more seed projects which are more exploratory in nature with no industry contribution, but also because it continues to initiate projects under the PSTS;
- (d) HKRITA has improved by 5.8 percentage points since it has commenced two larger-scale projects of over \$10 million each; and

- (e) APAS has improved by 7.3 percentage points as it has undertaken three more new collaborative projects in 2015-16 than in 2014-15.

13. In general, we consider the performance of the R&D Centres in 2015-16 satisfactory in this aspect as they all exceeded the target level of industry contribution of 20%.

R&D Projects and Expenditure

14. The numbers of R&D projects of the five Centres in 2015-16 and 2014-15 are summarised below –

Table 3: No. of New Projects
and On-going Projects as at end-March 2016

	No. of New Projects Commenced			No. of On-going Projects		
	2014-15	2015-16	% change	As at Mar 2015	As at Mar 2016	% change
ASTRI	44	42	-5%	61	69	+13%
NAMI	41	45	+10%	55	82	+49%
LSCM	17	16	-6%	29	35	+21%
HKRITA	25	21	-16%	57	62	+9%
APAS	8	13	+63%	26	36	+38%
Total	135	137	+1%	228	284	25%

15. In 2015-16, -

- (a) ASTRI has commenced 42 new projects, which was similar to 2014-15;
- (b) NAMI has commenced 45 new projects, representing an increase of 10%;
- (c) LSCM has commenced 16 new projects, which was similar to 2014-15;

- (d) HKRITA has commenced 21 new projects, which has decreased by 16% since it has dedicated more efforts on cross-discipline projects and projects involving higher levels of complexity; and
- (e) APAS has commenced 13 new projects, representing an increase of 63%, because it has further capitalised on its connections and broaden its research network.

16. Among these projects, many are collaborative projects which require industry contribution of at least 30% of the project cost. The industry sponsor(s) of these projects will be entitled to utilise the intellectual property (“IP”) rights arising from the projects exclusively for a defined period or own the project IP. A summary of these projects is as follows -

Table 4: No. of New Collaborative Projects
and On-going Collaborative Projects as at end-March 2016

	No. of New Projects Commenced			No. of On-going Projects		
	2014-15	2015-16	% change	As at Mar 2015	As at Mar 2016	% change
ASTRI	3	4	+33%	5	8	+60%
NAMI	16	27	+69%	20	40	+100%
LSCM	1	2	+100%	3	3	0%
HKRITA	5	5	0%	18	17	-6%
APAS	3	6	+100%	11	15	+36%
Total	28	44	+57%	57	83	+46%

17. In 2015-16, the R&D Centres have commenced a total of 44 collaborative projects, representing an increase of 57% compared with 28 projects in 2014-15.

18. As regards R&D expenditure, the situation is as follows -

Table 5: R&D Expenditure (\$ million)

	2014-15	2015-16	% Change
ASTRI	236.9	243.7	+3%
NAMI	41.1	63.2	+54%
LSCM	35.1	67.4	+92%
HKRITA	40.7	51.1	+26%
APAS	34.7	54.6	+57%
Total	388.5	480.0	+24%

19. In 2015-16, the R&D expenditure of all R&D Centres has increased on average by 24%, in line with the increase in the number of on-going projects. As at end-March 2016, the five R&D Centres had a total of 284 projects still on-going, representing an annual increase of 25%.

20. Nevertheless, it should be noted that while the figures for a particular year are useful for understanding the work of the R&D Centres, year-on-year variations are inevitable due to –

- (a) short-term fluctuations in market demand and economic situation which may affect the negotiations/discussions of the R&D Centres with their industry partners/sponsors; and
- (b) the wish of the R&D Centres to deliver certain public missions, such as the application of their technologies in the public sector, which may affect their short-term income indicators.

New Performance Indicators from 2017-18 onwards

21. During FC’s discussion of the additional allocation to the R&D Centres in late 2015, there were suggestions that the Government should set new performance indicators to assess the R&D Centres’ performance in conducting R&D in collaboration with the industry in order to promote the latter’s overall technological level. In this connection, we consider it appropriate to assess the performance of R&D Centres through the “the level of income received from the industry”. The indicator will cover sponsorship from the industry for their R&D projects as well as income arising from licensing and contract services, etc.

22. Furthermore, we will also consider adopting other performance indicators, such as the number of R&D projects with industry participation, the number of companies participating in the R&D projects, the number of organisations benefitting from the PSTS, etc. From 2018 onwards, we will present these new performance indicators in the annual updates.

REPORT ON INDIVIDUAL CENTRES

23. The ensuing paragraphs will highlight the key activities of each R&D Centre.

ASTRI

24. In 2015-16, ASTRI commenced 42 new projects, comprising 14 platform projects¹, 4 collaborative projects², 23 seed projects³ and 1 project under the PSTS. The amount of industry income received increased from \$76.92 million in 2014-15 to \$81.43 million in 2015-16, demonstrating a continual progress in the commercialisation and licensing of technologies to the industry.

25. ASTRI has been working closely with the industry on four technology areas –

- (a) *Financial Technologies* – In 2015, ASTRI signed service contracts with two banks for providing cyber-threat intelligence services and cyber-security assessment on mobile applications. ASTRI has also been discussing with major banks in Hong Kong for the use of its technologies on face recognition and video analytics for online transaction authentications. In May 2015, the ASTRI Security Lab was established to provide advanced security consultancy and assessment, and nurture local information security experts and

¹ Platform projects require industry contribution of at least 10% of the project cost. The industry sponsors will not own the IP. Since February 2014, the industry contribution requirement for projects initiated by Government bureaux/departments and statutory bodies with clear community benefits has been waived.

² Collaborative projects require industry contribution of at least 30% (for R&D Centre projects only) or 50% (for non-R&D Centre projects) of the project cost. The industry sponsor(s) will be entitled to utilise the project IP exclusively for a defined period or own the project IP.

³ Seed projects are more forward-looking and exploratory projects that aim to provide foundation work for future platform/collaborative projects. No industry contribution is required for seed projects. The funding amount is capped at \$2.8 million per project.

practitioners. Furthermore, ASTRI is working with the Hong Kong Monetary Authority (“HKMA”) and the banking industry on cyber security and blockchain technology development;

- (b) *Intelligent Manufacturing Initiative (“IMI”)* – ASTRI is developing IMI technologies that focus on robotic vision, integrated power module packaging and predictive analytics for big data. It has also been promoting technologies that enable information centric operation for replacing the present labour intensive operation. In June 2015, ASTRI set up a Joint R&D Centre with a renowned display technology company for commercialisation of its new vision technologies;
- (c) *Next Generation Network* – ASTRI continued its R&D efforts on advanced 4G+/5G technologies including small cell technologies, virtualised mobile core network software, Internet-of-Things (“IoT”) technologies for smart home and Internet of Vehicles. In 2015, ASTRI established an open end-to-end wireless Innovation Platform by integrating ASTRI and third party’s Long Term Evolution technologies to provide a configurable network environment for system development, integration and verification; and
- (d) *Health Technology Initiative* - ASTRI has continued its R&D efforts on medical imaging and health monitoring devices. With the establishment of a complete technical platform for digital pathology applications from high throughput image acquisition to computer-aided diagnostic analytics in 2015, ASTRI is currently expanding capability into the endoscopy field.

On health monitoring device, ASTRI conducted a series of projects in 2015-16 on optoelectronics-based pulse oximetry to monitor the levels of blood pressure and blood glucose, as well as detect and identify food contamination. ASTRI also successfully commercialised its technologies on high speed pathology slide scanner and miniaturised blood pulse oximeter.

26. Furthermore, ASTRI established new consortia, joint R&D centres and laboratories with industrial partners in 2015 such as the ASTRI-Truly Joint R&D Centre on manufacturing technologies in June 2015.

NAMI

27. In 2015-16, NAMI commenced 45 new projects, comprising 6 platform projects, 27 collaborative projects, 9 seed projects and 3 projects under the PSTS. The number of new collaborative projects commenced increased from 16 in 2014-15 to 27 in 2015-16.

28. Over the years, NAMI has successfully developed a number of platform technologies, such as nanofibre, foam concrete, bacteria repellent materials, etc. These formed the technological foundation upon which NAMI supported industries to further develop practical applications to capture market opportunities.

29. These technologies have won various awards in 2015-16. For example, “a portable and quick vitro diagnostic platform” was awarded a gold medal in the 44th International Exhibition of Inventions Geneva and a silver award under the Technology Achievement Award in the Hong Kong Federation of Innovative Technologies and Manufacturing Industries Achievement Award 2015. “Breathable and Bactericidal N99-qualified Facemask Using Nanofibre Technology” won a silver medal in the 44th International Exhibition of Inventions Geneva. The “Advanced Thermal Insulation Coating” also won a Certificate of Merit in the 2015 Hong Kong Green Innovations Award.

30. NAMI has also put many efforts in promoting commercialisation and technology transfer. A successful case was the development of a nanofibre facemask using NAMI’s nanofibre technology, which combined the benefits of comfort, antimicrobial function and safety. The product has recently been certified by a renowned laboratory in the United States for being capable of blocking over 99% particles. The product was launched in the Hong Kong market in January 2016.

31. NAMI has also been actively promoting the applications of its R&D outcomes in the public sector. For example, NAMI has developed innovative materials such as thermal interface materials, reflective coatings and electrically conductive coatings for use in high power plasma lighting. As compared with traditional lighting, plasma lighting is superior in terms of illumination, lifetime and energy consumption. NAMI has installed the plasma lighting in a public organisation for trial.

32. NAMI has also developed a novel oxidation technology for surface treatment of magnesium alloy and cooperated with a trade association to apply it to mobile phone cases and parts, heat sinks and lighting housing made of magnesium alloys. This technology could improve corrosion resistance, wear resistance and appearance.

33. NAMI has worked closely with local and overseas universities and research centres. An example was a project on lithium ion battery lifetime model, which involved collaborative efforts among NAMI, the Hong Kong Polytechnic University, Fraunhofer Institute for Silicate Research ISC of Germany and an industry partner.

LSCM

34. In 2015-16, LSCM commenced 16 new projects, comprising 6 platform projects, 2 collaborative projects, 2 seed projects and 6 projects under the PSTS. The number of licensing agreements signed increased from 14 in 2014-15 to 18 in 2015-16.

35. Some examples of the Centre's work on enabling research and commercial adoption in 2015-16 include –

- (a) *Logistics Industry* – In collaboration with the Customs and Excise Department, LSCM implemented an IoT-based cross-boundary cargo truck monitoring system to facilitate over 264 transshipment routes connecting 22 control points inside the Pearl River Delta region. The system provides end-to-end seamless transshipment with minimal customs clearance time without stopover.

Separately, to upgrade SME's connectivity and e-agility, LSCM also developed new robotics and automation technologies such as the Automated Guided Vehicles and Smart IoT warehouse automation and the Interoperable SME e-logistics exchange platform for the logistics industry;

- (b) *Hong Kong International Airport ("HKIA")* – LSCM, in collaboration with the Airport Authority Hong Kong, developed a world-class Radio-frequency identification ("RFID") luggage handling system utilising IoT devices to enhance baggage tracking and delivery at the HKIA and a low cost dual RFID and Quick Response-code reader system and home-printed luggage label for self check-in. LSCM has also developed a video-based analytics

system for airport asset monitoring and a virtual reality-based airfield training and simulation system;

- (c) *Construction Industry* – LSCM developed an IoT-based safety belt monitoring system for enhancing safety of workers working at height and an RFID-based alarm device for construction vehicles to promote work safety in construction sites. LSCM also developed an IoT-based just-in-time prefabrication housing construction management system in collaboration with Hong Kong Housing Authority and a proactive construction management system utilising dynamic Building Information Modelling technology; and
- (d) *E-Cheque Initiative* – In collaboration with HKMA, LSCM developed an e-Cheque cloud application development platform to facilitate financial institutions, payment service providers and businesses to build e-Cheque applications and promote the use of e-Cheque in Hong Kong.

36. To further advance Hong Kong's position as a highly connected Wi-Fi city in the world, LSCM has, in collaboration with a local university, also supported the R&D of robust Mesh Wi-Fi network for serving major local marine ports and logistics infrastructures. The technologies were commercialised by a local company in 2015. Riding on this success, LSCM is further supporting the development of intelligent Access Point technology with the trial support of a listed estate management company.

HKRITA

37. In 2015-16, HKRITA commenced 21 new projects, comprising 8 platform projects, 5 collaborative projects, 2 seed projects and 6 projects under the PSTS. Its level of industry contribution in 2015-16 is 34.4%, which marks a year-on-year improvement of 5.8 percentage points.

38. HKRITA has continued to build up its in-house research capabilities in environmentally friendly and high-performance textile, and initiated more centre-owned, cross-discipline and industry-driven research projects to fill the gaps between academic research and demands from the industry. In 2015-16, HKRITA has commenced 5 in-house R&D projects.

39. In 2015-16, HKRITA has dedicated its effort to commercialise technologies through transferring its technologies to the industry. For example, HKRITA has applied its new material technology for removing dirt and stain

under sunlight to the production of staff uniforms of a Hong Kong-based world-renowned hotel group. HKRITA has also continued to promote the application of technologies in the public sector, with focus on elderly services and Hong Kong athletics who will take part in the 2016 Olympic Games.

40. In April 2016, HKRITA achieved outstanding results in the 44th International Exhibition of Inventions of Geneva. HKRITA won three Gold medals, one Silver medal and two Bronze medals. Among the gold medals, two technologies (on “solvent-assisted dyeing of natural fiber” and “conversion of food waste into polylactic acid fiber”) were awarded with special “Jury Commendation”.

41. In terms of international collaboration, HKRITA has in 2015-16 signed memoranda of understanding with the Commonwealth Scientific and Industrial Research Organisation, the University of Oregon and Wuhan Textile University.

APAS

42. In 2015-16, APAS commenced 13 new projects, comprising 1 platform project, 6 collaborative projects, 3 seed projects and 3 projects under PSTS. There is also substantial improvement in terms of the level of industry contribution and commencement of new projects.

43. One of the major R&D achievements of APAS in 2015-16 was the development of an electrical vehicle (“EV”) multiple standard mobile quick charger, which is compatible with the International Electrotechnical Commission fast charging standard. Unlike traditional EV charging stations which are stationed in fixed locations, this charger offers mobile charging solution and can be utilised as a portable power source for other applications such as road side work. This technology won a Silver Medal in the 44th International Exhibition of Inventions Geneva.

44. APAS has been utilising the PSTS to apply its R&D outcomes to the community. For example, based on the technologies of its Advanced Driver Assistance System, APAS satisfactorily completed a trial project in 2015-16 which enhanced safety around large and heavy moving machineries in the works sites of four government departments. The results and feedbacks of the project will be used for further enhancement of the system.

ADVICE SOUGHT

45. Members are invited to note the latest progress of the R&D Centres as set out above.

**Innovation and Technology Bureau
Innovation and Technology Commission
June 2016**

**Hong Kong Applied Science and Technology Research Institute (ASTRI)
Highlight of Operation in 2015-16**

I. New R&D Projects and Industry Contribution (in \$million)

	<u>2014-15</u>			<u>2015-16</u>		
	No. of New Projects	Project Cost	Industry Contribution	No. of New Projects	Project Cost	Industry Contribution
Platform	19	241.3	47.4 (21.8%)	14	239.1	49.7 (24.3%)
Collaborative	3	31.4	16.2 (51.6%)	4	27.5	14.1 (51.2%)
Seed	17	46.4	0.1 (0.3%)	23	61.5	n/a
Total:	39	319.1	63.7 (21.6%)	41	328.1	63.8 (21.7%)
Public Sector Trial Scheme	5	15.1	n/a	1	6.1	n/a

Note: Figures in brackets denote the level of industry contribution.

II. Operating Expenditure (in \$million)



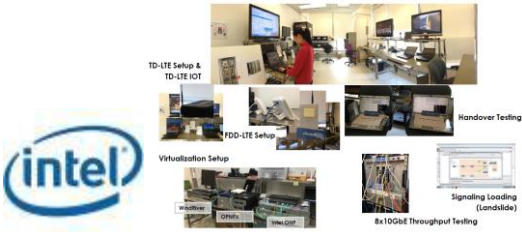
	2014-15	2015-16
Staffing	72.8	73.6
Accommodation	25.8	30.2
Equipment	2.1	3.9
Others	22.3	38.1
Total:	123.0	145.8

III. Industry Income Received (in \$million)


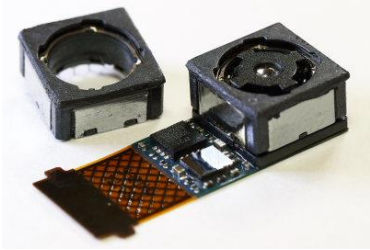
	2014-15	2015-16
Sponsorship for projects	52.18	61.37
Licensing/Royalty	12.11	2.99
Contract Services	12.02	16.69
Others	0.61	0.38
Total:	76.92	81.43

IV. Progress of Selected Projects on R&D, Commercialisation and Use of R&D Outcomes in the Public Sector

Project / Technology	Status / Progress
<p>Cardio-vascular Monitoring Device, Portal Interactive Projector and Touch Panel</p> 	<p>ASTRI has been working closely with various NGOs for the adoption of its cardio-vascular monitoring device, portal interactive projector and touch panel.</p> <p>The Jockey Club Cadenza Hub is one of the trial partners of ASTRI. The wrist bracelet designed by ASTRI for cardio-vascular monitoring has been adopted in trial in elderly centres and primary healthcare centres of the Cadenza Hub with training provided by ASTRI to the staff in the centres for proper usage.</p> <p>Portable interactive projectors and touch panels developed by ASTRI were installed in 6 NGO sites in 2015 to enhance brain training activities and improve life quality of the elderly.</p> <p>In March 2016, ASTRI supported Hong Kong Housing Society's Age Friendly City Lounge Carnival by demonstrating its technology to the NGOs and Government organisations.</p>
<p>ASTRI-SAE Joint R&D Centre with SAE Magnetics (Hong Kong) Limited (SAE)</p> 	<p>ASTRI and SAE established the ASTRI-SAE Joint R&D Centre in December 2015 to boost intelligent manufacturing technologies through facilitating strategic partnership development, talent cultivation and technological entrepreneurship.</p> <p>The centre focuses on R&D innovation activities with smart factory as the first chapter of the cooperation.</p>

Project / Technology	Status / Progress
<p>FinTech Collaborative Innovation Centre (FCIC) with Beijing Institute of Collaborative Innovation (BICI)</p> 	<p>Under a Memorandum of Understanding signed between ASTRI and BICI on 28 November 2015, the FCIC was established to enhance FinTech innovation.</p> <p>FCIC will focus on developing joint R&D projects in FinTech, big data and mobile software platform, sharing of information and technologies, and exchanging and nurturing talents between Hong Kong and Beijing.</p>
<p>Cyber-Security Intelligence Service</p> 	<p>The ASTRI Security Lab (ASL) is ASTRI's key cyber-security R&D and knowledge sharing lab. It develops innovative information security technologies, solutions and cryptographic systems, and provides advanced security assessment, consultancy and review services.</p> <p>A contract was signed with a global bank for the provision of cyber-threat intelligence services, demonstrating the maturity of ASL on providing cyber-threat intelligence to financial institutions.</p> <p>ASTRI is also engaging the Hong Kong Monetary Authority for future projects on cyber threat intelligence.</p>
<p>Network Function Virtualization (NFV) Technology</p> 	<p>ASTRI has collaborated with Intel Corporation to develop NFV technology for Long-Term Evolution core network solution.</p> <p>The outcome of this new technology will reduce the amount of hardware required for launching and operating network services, which would help reduce capital and operating expenses.</p> <p>The Intel-ASTRI co-developed NFV prototype was showcased at the Mobile World Congress (MWC) Shanghai 2015 and MWC 2016 Barcelona.</p>

Project / Technology	Status / Progress
<p>Small Cell Technology</p>  	<p>The small cell technology developed by ASTRI has been successfully commercialised and being used in both private and public networks. For example, ASTRI enabled the small cell system of its partner Sunnada to complete all the network acceptance tests and obtained certifications for commercial deployment.</p> <p>ASTRI also showcased the latest pre-5G technologies in collaboration with its partner at the MWC 2016 Barcelona.</p>
<p>Indoor and Outdoor Geographic Information System (GIS) and Internet-of-Things (IoT) Platform</p> 	<p>This technology allows end users to locate oneself within indoor premises and navigate to different locations effectively.</p> <p>ASTRI applied the technology in the project “Real Time Location Proximity Data System for Smart Cities” and won the First Runner-Up Award in the Electronics Division Project Competition 2016 “IoT Development For Smart Cities” of the Hong Kong Institution of Engineers.</p> <p>ASTRI showcased the technology as “Magi Guide” in InnoCarnival 2015. Magi Guide underpins a scalable server software stack solution for deployment of large scale enterprise and consumer grade GIS and IoT applications and systems.</p>

Project / Technology	Status / Progress
<p data-bbox="217 259 775 293">Intelligent Visual Inspection Technology</p> 	<p data-bbox="815 259 1398 432">This project has developed an intelligent surface defects inspection technology platform for surfaces of different characteristics, which can increase production efficiency and quality.</p> <p data-bbox="815 472 1398 651">A manufacturing company engaged ASTRI to provide surface inspection technology in 2015. The project deliverables were implemented at the factory for field testing in the first quarter of 2016.</p> <p data-bbox="815 692 1398 871">ASTRI also completed the design of glass defect inspection system for OGS touch panel in early 2016. Field testing will be conducted in another manufacturer's factory soon.</p>
<p data-bbox="217 992 767 1066">Anti-shaking Compact Camera Module Technologies</p> 	<p data-bbox="815 992 1398 1133">The anti-shaking compact camera module technology developed by ASTRI was transferred to AP Photonics Limited (APP) in 2010 under a licensing agreement.</p> <p data-bbox="815 1173 1398 1247">APP has further developed this technology for adoption in mobile devices.</p>

**Nano and Advanced Materials Institute (NAMI)
Highlight of Operation in 2015-16**

I. New R&D Projects and Industry Contribution (in \$million)

	<u>2014-15</u>			<u>2015-16</u>		
	No. of New Projects	Project Cost	Industry Contribution	No. of New Projects	Project Cost	Industry Contribution
Platform	7	14.4	1.7 (12.1%)	6	21.3	2.1(10.0%)
Collaborative	16	36.8	17.9 (48.6%)	27	60.6	28.6(47.2%)
Seed	12	33.3	n/a	9	24.3	n/a
Total:	35	84.5	19.6 (23.2%)	42	106.2	30.7(28.9%)
Public Sector Trial Scheme	6	3.9	n/a	3	4.70	n/a

Note: Figures in brackets denote the level of industry contribution.

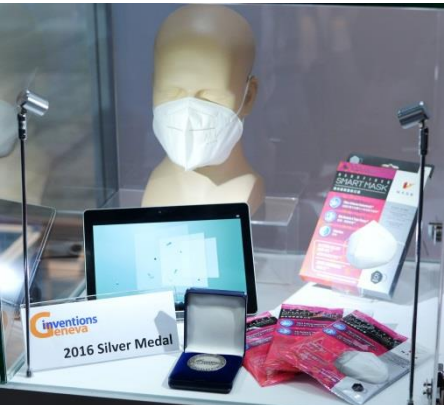
II. Operating Expenditure (in \$million)


	2014-15	2015-16
Staffing	32.0	29.5
Accommodation	4.6	7.9
Equipment	5.9	6.4
Others	11.1	10.5
Total:	53.6	54.3


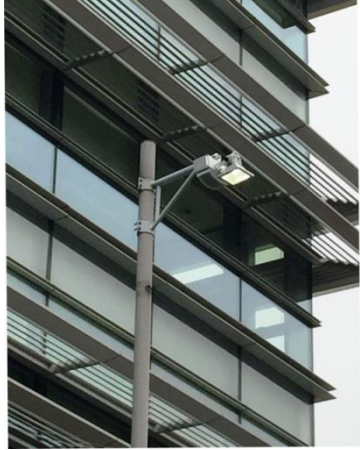

III. Industry Income Received (in \$million)


	2014-15	2015-16
Sponsorship for projects	17.65	25.63
Licensing/Royalty	0.94	0.69
Contract Services	13.21	5.07
Others	0.11	0.19
Total:	31.91	31.58

IV. Progress of Selected Projects on R&D, Commercialization and Use of R&D Outcomes in the Public Sector

Project / Technology	Status / Progress
<p>Advanced Nanofibre Materials for Enhanced Delivery of Active Ingredients and Improved Fluid Relocation</p> 	<p>NAMI has developed a nonwoven mesh of nanofibres as filtration layer providing unique benefits such as respiratory comfort, antimicrobial protection and excellent filtration. This technology has been adopted in applications such as filtering membranes used in medical devices and wound dressings.</p> <p>An industry sponsor has also adopted this technology to develop a facemask that offers the protection of N99 respirator with the comfort of surgical mask. The product has recently been certified by a renowned laboratory in the United States for being capable of blocking over 99% particles. The facemask was officially launched in Hong Kong market in January 2016 and won a silver medal in the 44th International Exhibition of Inventions Geneva.</p> <p>Apart from applications in the healthcare sector, NAMI is exploring to extend this nanofibre platform technology to other applications such as water purification, air filtration and new battery materials.</p>

Project / Technology	Status / Progress
<p data-bbox="215 259 810 338">Anti-scratch and Self-Cleaning Coating on Glass Substrate</p> 	<p data-bbox="849 259 1412 416">As building material, glass is easily contaminated with dirt, dust and oils which will affect its performance with reduced transparency.</p> <p data-bbox="849 472 1412 831">NAMI has developed a long-lasting anti-scratch and self-cleaning coating on glass. The technology improves performance of the glass used in buildings as it can preserve the pristine surface of glass with a protective self-cleaning coating. The product will be launched to market in the fourth quarter of 2016.</p>
<p data-bbox="215 898 810 1010">Novel Lab-On-Chip Diagnostic Application for Rapid Swine Influenza Virus Detection</p> 	<p data-bbox="849 898 1412 1133">The growing public awareness of cross-species transmission of viruses to human, such as H1N1 from swine and H3N2 and H7N9 from avian species, has created a market for fast, simple and portable diagnostic kits.</p> <p data-bbox="849 1189 1412 1346">The project has developed a portable lab-on-chip platform with easy-to-read results ready in 15 minutes for influenza virus detection.</p> <p data-bbox="849 1402 1412 1525">This innovative technology won a gold medal in the 44th International Exhibition of Inventions Geneva.</p> <p data-bbox="849 1581 1412 1738">The industry sponsor is scaling up the production of the project and is planning to launch it to the market in the fourth quarter of 2016.</p>

Project / Technology	Status / Progress
<p data-bbox="220 264 662 297">High Power Plasma Lighting</p>  	<p data-bbox="853 264 1412 459">Plasma lighting is an emerging new technology to tackle problems of traditional lighting, such as high power consumption, short lifetime and low energy efficiency.</p> <p data-bbox="853 517 1412 831">In collaboration with the project sponsor, NAMI has successfully developed a wide range of innovative materials such as thermal interface materials, reflective coatings and electrically conductive coatings to realise the advantages of high power plasma lighting.</p> <p data-bbox="853 889 1412 1084">The industry sponsor has already started scaling-up the production line and is planning to launch the product in both local and the United States markets.</p>
<p data-bbox="220 1220 821 1299">Printable and Flexible Lithium Ion Batteries for Portable Electronic Devices</p> 	<p data-bbox="853 1220 1412 1496">Wearable electronic technology is gaining popularity in recent years. Following this trend, NAMI has developed printable and flexible lithium ion batteries for using in wearable electronic products and applications.</p> <p data-bbox="853 1554 1412 1794">NAMI has applied this technology in three collaborative projects, including the development of bendable batteries with enhanced safety features for use in devices such as smart watches and mobile phones.</p>

Project / Technology	Status / Progress
<p data-bbox="217 259 818 338">Nano Modified Alkali Activated Cement (AAC) Based Rapid Repair Material</p> 	<p data-bbox="850 259 1410 611">NAMI, with the support from the Drainage Services Department, has developed a new AAC material which is an environment-friendly alternative to cement. It contains recycled materials such as fly ash and slag and is a quick-setting inorganic binding material with high early strength, excellent fire and acid resistance.</p> <p data-bbox="850 674 1410 869">The technology has been licensed as a background intellectual property for the development of a cost effective repair mortar for sewerage system and a green dry-mix repair mortar.</p> <p data-bbox="850 931 1410 1081">NAMI is exploring to extend the AAC technology to other applications such as precast products, ready mix concrete and panel materials.</p>

**Hong Kong R&D Centre for
Logistics and Supply Chain Management Enabling Technologies (LSCM)
Highlight of Operation in 2015-16**

I. New R&D Projects and Industry Contribution (in \$million)

	<u>2014-15</u>			<u>2015-16</u>		
	No. of New Projects	Project Cost	Industry Contribution	No. of New Projects	Project Cost	Industry Contribution
Platform	6	41.2	4.9 (22.6%)	6	48.4	7.6 (22.1%)
Collaborative	1	9.9	5 (50.7%)	2	3.2	1.6 (51.6%)
Seed	-	-	-	2	5.7	1.0 (16.8%)
Total:	7	51.1	9.9 (31.4%)	10	57.3	10.2 (23.5%)
Public Sector Trial Scheme	10	32.8	n/a	6	21.7	n/a

Note: Figures in brackets denote the level of industry contribution.

II. Operating Expenditure (in \$million)



	2014-15	2015-16
Staffing	14.3	14.5
Accommodation	4.0	4.9
Equipment	1.0	0.8
Others	5.5	4.9
Total:	24.8	25.1

III. Industry Income Received (in \$million)

	2014-15	2015-16
Sponsorship for projects	7.28	7.44
Licensing/Royalty	0.22	0.40
Contract Services	0.09	0.03
Others	-	-
Total:	7.59	7.87

IV. Progress of Selected Projects on R&D, Commercialisation and Use of R&D Outcomes in the Public Sector

Project / Technology	Status / Progress
<p>Single E-lock Scheme</p>  <p><i>On 15 March 2016, Hong Kong Customs & Excise Department (C&ED) and Guangdong Sub-Administration of General Administration of Customs announced the formal launch of the Single E-lock Scheme</i></p>  <p><i>80% of air-land intermodal transshipment cargo enjoys the seamless clearance facilitation provided by C&ED</i></p>	<p>With the support from the C&ED, LSCM has been developing electronic lock technology to facilitate Intermodal Transshipment Facilitation Scheme (ITFS) since 2010.</p> <p>In March 2016, a “green lane” was built at the Hong Kong-Mainland boundary with a single e-lock for separate monitoring by both C&ED and Mainland Customs. This system will facilitate customs clearance across the boundary and speed up logistics flow through seamless clearance service.</p> <p>The numbers of clearance points in Guangdong province has increased from 3 to 22 since the launch of the pilot run.</p>

Project / Technology	Status / Progress
<p>RFID-enabled Sensing Technologies for Real-time Environmental Monitoring and Risk Management (REMS)</p>  <p><i>Museum curators can remotely monitor different parameters, like temperature, humidity, ultraviolet intensity, etc. through the REMS</i></p>	<p>LSCM, in collaboration with the Chinese University of Hong Kong (CUHK), has integrated radio-frequency identification (RFID) -enabled sensing technologies in the REMS.</p> <p>Using the open Industrial Scientific Medical radio band, the REMS is more accurate, flexible and cost effective to operate.</p> <p>The REMS was also adopted by the Hong Kong Science Museum during its Western Scientific Instruments of Qing Court Exhibition in August 2015.</p>
<p>Multi-purpose Smart Cane</p>  <p><i>Trial at Hong Kong Society for the Blind</i></p>  <p><i>The mobile app</i></p>  <p><i>Gold Metal Award: International Exhibition of Inventions at Geneva (April 2016)</i></p>	<p>This project aims to help visually-impaired people to navigate better both indoors and outdoors.</p> <p>LSCM integrated the low-cost reader technology into the guiding cane and developed a mobile app. By reading the signals sent from the guiding cane, audible navigation information for the visually impaired people will be provided.</p> <p>Trial of the project was conducted at the Hong Kong Society for the Blind, which has formed a social enterprise to further commercialise this technology after the trial.</p> <p>The trial project is also extended to two railway stations to provide navigation information in an open environment.</p> <p>The project won a “Gold Medal with Congratulations of the Jury” in the 44th Geneva International Exhibition of Inventions in April 2016.</p>

Project / Technology	Status / Progress
<p data-bbox="220 257 699 369">Internet-of-Things (IoT) System in Construction Sites to Support Safety-at-Work Practice</p> <p data-bbox="391 421 646 454">Safety Belt Sensor</p> <div data-bbox="288 472 445 712">  </div> <p data-bbox="252 723 486 831"><i>Fall arrestor with life rope for scaffolding</i></p> <div data-bbox="579 472 753 712">  </div> <p data-bbox="531 723 799 790"><i>Sensors mounted on harness and lanyard</i></p> <p data-bbox="263 842 774 909">Rear Alarm System for Construction Vehicles</p> <div data-bbox="402 920 633 1180">  </div>	<p data-bbox="842 257 1412 398">LSCM has deployed the IoT system in construction sites to enhance work safety on site. Prototypes have been tested at several construction sites.</p> <p data-bbox="842 459 1412 674">The project includes a real-time safety belt sensor which will alert the worker whenever the worker forgets to put on a safety belt properly and a rear alarm system to alert driver when worker appears at the danger zone of the working vehicle.</p> <p data-bbox="842 730 1412 835">The system was awarded a bronze medal in the 44th Geneva International Exhibition of Invention in April 2016.</p>
<p data-bbox="220 1227 762 1294">Low Cost Hybrid Reader and Reusable Baggage Tags</p> <div data-bbox="220 1350 738 1641">  </div> <p data-bbox="220 1653 464 1686"><i>Hybrid RFID reader</i></p> <div data-bbox="220 1686 759 2000">  </div> <p data-bbox="220 2011 435 2045"><i>RFID luggage tag</i></p>	<p data-bbox="842 1227 1412 1406">LSCM has developed a low cost hybrid reader for reading bar code and RFID tags for the Hong Kong International Airport for the implementation of home printed luggage tags service.</p> <p data-bbox="842 1462 1412 1720">Together with the development of reusable baggage tags, passengers can print and tag their baggage prior to arriving at the airport. This will reduce the processing time at airline check-in counters and provide a more enjoyable pre-flight experience for passengers.</p>

Hong Kong Research Institute of Textiles and Apparel (HKRITA)
Highlight of Operation in 2015-16

I. New R&D Projects and Industry Contribution (in \$million)

	<u>2014-15</u>			<u>2015-16</u>		
	No. of New Projects	Project Cost	Industry Contribution	No. of New Projects	Project Cost	Industry Contribution
Platform	5	16.3	3.1 (19.5%)	8	30.4	8.3 (27.5%)
Collaborative	5	11.8	6.0 (51.0%)	5	24.1	12.3 (51.0%)
Seed	2	4.2	0.1 (1.4%)	2	5.6	n/a
Total:	12	32.3	9.2 (28.6%)	15	60.1	20.6 (34.4%)
Public Sector Trial Scheme	13	11.4	n/a	6	6.8	n/a

Note: Figures in brackets denote the level of industry contribution.

II. Operating Expenditure (in \$million)

	2014-15	2015-16
Staffing	15.6	16.9
Accommodation	2.4	3.0
Equipment	0.1	3.5
Others	6.0	6.2
Total:	24.1	29.6


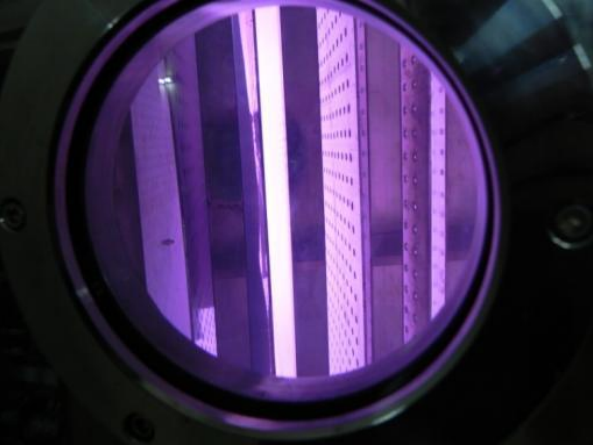
III. Industry Income Received (in \$million)


	2014-15	2015-16
Sponsorship for projects	1.29#	4.63#
Licensing/Royalty	0.32	0.40
Contract Services	-	0.09
Others	0.13*	0.64
Total:	1.74	5.76



* *Income generated from sales of prototype, membership fee and sponsorship for conference/seminar*


Excluded sponsorship directly collected by local research institutions from sponsors.


IV. Progress of Selected Projects on Research and Development (R&D), Commercialisation and Use of R&D Outcomes in the Public Sector


Project / Technology	Status / Progress
<p>Plasma Treatment System for Wool/cashmere Knitwear to Minimize Pilling</p>  	<p>Pilling of garments has been a long-standing problem for apparel industry, especially for knitwear made of wool/cashmere fibers. Plasma treatment is a dry, pollution-free, effective and low cost treatment process for wool/cashmere knitwear, which can improve the pilling grade.</p> <p>HKRITA developed in 2013 an industry-scale plasma treatment system for wool/cashmere knitwear in the market.</p> <p>A non-exclusive licence and the project prototype were taken up by one of the project sponsors after project completion.</p> <p>This technology won a Gold medal at the 43rd International Exhibition of Inventions of Geneva in 2015.</p>

Project / Technology	Status / Progress
<p data-bbox="220 264 785 376">Advanced Clothing Functional Design Computer Aided Design (CAD) Technologies</p>  	<p data-bbox="842 264 1407 656">HKRITA developed the CAD technology through an R&D project completed in 2011. Since then, HKRITA has, based on this R&D outcomes, designed a CAD software system for designing multi-style functional apparel products and textiles. As at 31 March 2016, HKRITA has signed 5 licensing agreements for disseminating this technology.</p> <p data-bbox="842 719 1407 1305">With the support from the Hong Kong Sports Institute (HKSI) Rowing Team, HKRITA has commenced a PSTS project “Advanced Clothing Functional Design CAD Technologies (II)” in June 2015. It aims to: i) design and develop high performance training and competition sportswear for the HKSI Rowing Team; ii) verify the simulation performance of CAD software after trial by HKSI Rowing Team; and iii) facilitate the realisation and commercialisation of advanced functional CAD software for high performance sportswear in the market.</p> <p data-bbox="842 1368 1407 1682">Through this PSTS project, high performance training and competition rowing sportswear with ergonomic design, thermal/ touch comfort and UV protection have been produced for trial. In 2015, the rowing team won 3 silver and 2 bronze medals in the Asian Championships.</p> <p data-bbox="842 1744 1407 1935">A special version of competition speed suit and a set of training suits have been developed for the HK team in preparation of the Olympic Games 2016.</p>

Project / Technology	Status / Progress
<p>Wearable Electronics for Better Quality Community Care of the Elderly (Phase II)</p>  	<p>HKRITA, together with ASTRI and LSCM, successfully conducted a trial project on “wearable electronics for better quality community care for the elderly” in 2013. A vest made by finer nu-torque yarn technologies and equipped with a radio-frequency identification (RFID) tracking system for locating elders suffering from Alzheimers was put on trial.</p> <p>Building upon this experience, the three R&D Centres have conducted a Phase II trial in 2015 in a day care centre of the Tung Wah Group of Hospitals. A detachable tracking device has been added to the system to facilitate the elders participating in outdoor activities. The outdoor apparel is made of Nu-Torque cotton yarn and embedded with a GPS tracker and Bluetooth Low Energy devices.</p> <p>So far, 140 vest prototypes were produced to provide new tracking functions both indoors and outdoors.</p>

Project / Technology	Status / Progress
<p data-bbox="215 264 815 338">Conversion of Food Waste into Poly(lactic acid) (PLA) Fibre</p> 	<p data-bbox="837 264 1412 651">This project studied the novel bioprocesses using food wastes for the sustainable production of poly(lactic acid) fibre in textile application. The technology uses a fermentation process to yield lactic acid which is then polymerised and spun into fibre. PLA is biodegradable and so the final textile product will degrade to H₂O and CO₂ after its useful life.</p> <p data-bbox="837 719 1412 869">The technology won a Gold medal with jury's commendation at the 44th International Exhibition of Inventions of Geneva in 2016.</p>

Project / Technology	Status / Progress
<p data-bbox="215 257 758 336">Bio-degradable Synthetic Fibres for Hairnets and Mouth Masks</p> 	<p data-bbox="837 257 1412 571">This PSTS project, completed on 28 February 2016, applied the developed metal chelating dual/multiple metal ions masterbatch technique from a completed platform project to produce degradable polypropylene and polyester fibers for making samples of hairnets and mouth masks.</p> <p data-bbox="837 627 1412 862">5 000 sets of degradable mouth masks and hairnets were produced for trial conducted in ten restaurants belonging to the Hong Kong Federation of Restaurants and Related Trades. The results were satisfactory.</p> <p data-bbox="837 918 1412 1086">A non-exclusive licence and the project prototype were taken up by one of the project sponsors after project completion.</p> <p data-bbox="837 1142 1412 1299">The technology won a Gold medal with jury's commendation at the 43rd International Exhibition of Inventions of Geneva in 2015.</p>

Project / Technology	Status / Progress
<p data-bbox="220 264 810 297">Solvent-assisted Dyeing of Cotton Fibre</p> 	<p data-bbox="847 264 1407 454">This project, completed on 31 December 2015, explored the use of solvents as a medium for assisting textile wet processing on cotton to reduce water consumption.</p> <p data-bbox="847 517 1407 831">The innovation of this project was an emulsion system employed for the dyeing process. Experimental results showed that the dyeing process through the emulsion system was feasible and the performance on the colour fastness was comparable with the samples with the conventional dyeing process.</p> <p data-bbox="847 893 1407 1043">The technology won a Gold medal with jury's commendation at the 44th International Exhibition of Inventions of Geneva in 2016.</p>

**Automotive Parts and Accessory Systems R&D Centre (APAS)
Highlight of Operation in 2015-16**

I. New R&D Projects and Industry Contribution (in \$million)

	<u>2014-15</u>			<u>2015-16</u>		
	No. of New Projects	Project Cost	Industry Contribution	No. of New Projects	Project Cost	Industry Contribution
Platform	4	12.5	1.7 (15.4%)	1	4.2	0.4 (10.0%)
Collaborative	3	20.6	10.4 (50.5%)	6	54.7	27.7 (50.6%)
Seed	1	2.6	n/a	3	7.9	0.3 (3.5%)
Total:	8	35.7	12.1 (35.2%)	10	66.8	28.4 (42.5%)
Public Sector Trial Scheme	-	-	n/a	3	3.3	n/a

Note: Figures in brackets denote the level of industry contribution.




II. Operating Expenditure (in \$million)



	2014-15	2015-16
Staffing	9.6	10.5
Accommodation	2.0	2.2
Equipment	0.2	0.8
Others	2.0	2.3
Total:	13.8	15.8



III. Industry Income Received (in \$million)



	2014-15	2015-16
Sponsorship for projects	16.25	22.65
Licensing/Royalty	-	-
Contract Services	0.20	0.61
Others	0.05	0.14
Total:	16.50	23.40






IV. Progress of Selected Projects on R&D, Commercialisation and Use of R&D Outcomes in the Public Sector

Project / Technology	Status / Progress
<p data-bbox="260 416 794 495">Pedestrian Warning and Protection System in Works Sites</p>   	<p data-bbox="868 416 1417 685">In October 2015, APAS completed trials for 8 prototype systems at the work sites of four government departments. The departments were satisfied with the trial result and provided suggestions for improving the prototype.</p> <p data-bbox="868 741 1417 1055">The system was also presented to the public in the InnoCarnival 2015 in November 2015. A booth displaying a construction site model with interactive games was set up to illustrate how the system would help reduce the number of accidents at construction sites.</p>

Project / Technology	Status / Progress
<p data-bbox="260 271 798 387">Automatic Electric Ground Surface Equipment (EGSE) Parking Bay Monitoring System</p>  	<p data-bbox="869 271 1417 465">In collaboration with the Airport Authority Hong Kong (AA), APAS implemented an automatic EGSE monitoring system in the HKIA in January 2016.</p> <p data-bbox="869 528 1417 757">This monitoring system is an image-based application for detecting occupancy of outdoor EV charging bays. The developed algorithm achieves high accuracy of 95% in outdoor environment.</p> <p data-bbox="869 819 1417 976">This system also facilitates the management work of EGSE chargers in airfield and improves the utilisation rate of charger and parking bay.</p> <p data-bbox="869 1039 1417 1312">With satisfactory feedback from the AA, APAS plans to further commercialise the project outcomes, including the system architecture of the parking bay monitoring system and the developed image recognition algorithm.</p>

Project / Technology	Status / Progress
<p data-bbox="260 271 547 309">EV Quick Charger</p>  	<p data-bbox="869 271 1417 465">APAS has conducted trials in several government departments and developed a prototype on 50kW stand-alone fast EV charger using Resonant Topology for the AA.</p> <p data-bbox="869 524 1417 600">A 6-month trial of the system will begin in August 2016 at the HKIA.</p> <p data-bbox="869 658 1417 1048">Riding on the success of CHAdeMO certification for 50kW fast charging station, APAS has developed another 50kW charging station which supports the new European International Electrotechnical Commission Combo Charging Standard (IEC CCS). This is the first CCS fast charging station developed in Hong Kong and the Mainland.</p>

Project / Technology	Status / Progress
<p data-bbox="260 271 778 387">Mobilised EV Charging Service Vehicle and Combo Fast Charging Station</p> 	<p data-bbox="866 271 1417 589">In 2015, APAS successfully developed the first mobilised EV charger in Hong Kong. With this system, only 20 minutes is required to charge the battery an EV up to 50%. The system can also be used as a portal power source for other applications such as road side work.</p> <p data-bbox="866 645 1417 801">This technology won a silver medal in the “44th International Exhibition of Inventions Geneva” held in Switzerland.</p>
<p data-bbox="260 920 794 992">Advanced Driver Assistance System (ADAS)</p> 	<p data-bbox="866 920 1417 1305">This ADAS project makes use of novel algorithms for the detection and tracking of moving objects by the shared use of motion vectors from H.264/Advanced Video Coding (AVC) encoders. The system is able to distinguish relatively fast moving objects from relatively slow moving objects, hence improving accuracy and cost effectiveness.</p> <p data-bbox="866 1368 1417 1563">The project was completed in August 2015. The project sponsor plans to complete further enhancements of the ADAS by October 2016, which will then be the commericalised.</p>

Project / Technology	Status / Progress
<p data-bbox="261 271 639 309">Bus Infotainment System</p>     	<p data-bbox="868 264 1417 613">APAS successfully developed the first generation media oriented system transport (MOST) through an R&D Project from 2009 to 2011. The system was able to link up a server with 60 monitors. Since 2012, APAS, together with the industry sponsor, has been commercialising the R&D outcome in Thailand.</p> <p data-bbox="868 663 1417 931">Locally, APAS has been conducting a PSTS project in three non-profit making organisations. Guangdong - HongKong cross-boundary bus company (GDHK) has also indicated interest to deploy the system in their bus fleet.</p> <p data-bbox="868 981 1417 1249">To further enhance the MOST technology, APAS is conducting another R&D project to develop the second generation MOST system. The system uses a scalable multi-ring technology that can support hundreds of monitors.</p> <p data-bbox="868 1299 1417 1491">APAS is actively discussing with potential users such as bus operators, high-speed train companies and ferry companies for the adoption of the second generation MOST system.</p>