

ベトナム国  
ハノイ市交通局

ベトナム国  
ハノイ公共交通ICカード相互利用  
開発支援プロジェクト  
【有償勘定技術支援】

プロジェクト業務完了報告書

2021年4月

独立行政法人  
国際協力機構 (JICA)

株式会社アルメックVPI  
東日本旅客鉄道株式会社  
東京地下鉄株式会社  
西日本鉄道株式会社  
JR東日本メカトロニクス株式会社

社基
JR
21-028

ベトナム国  
ハノイ市交通局

ベトナム国  
ハノイ公共交通ICカード相互利用  
開発支援プロジェクト  
【有償勘定技術支援】

プロジェクト業務完了報告書

2021年4月

独立行政法人  
国際協力機構 (JICA)

株式会社アルメックVPI  
東日本旅客鉄道株式会社  
東京地下鉄株式会社  
西日本鉄道株式会社  
JR東日本メカトロニクス株式会社

## 目次

<b>PART 1. プロジェクトの概要</b> .....	<b>1-1</b>
1.1 対象国.....	1-1
1.2 プロジェクト名.....	1-1
1.3 プロジェクト実施期間.....	1-1
1.4 プロジェクトの背景.....	1-2
1.5 プロジェクトの概要.....	1-4
1.5.1 上位目標.....	1-4
1.5.2 プロジェクト目標.....	1-4
1.5.3 期待される成果と活動.....	1-4
1.6 プロジェクト実施体制.....	1-5
1.6.1 プロジェクト運営組織.....	1-5
1.6.2 カウンターパート.....	1-5
1.6.3 JICA プロジェクトチーム.....	1-8
1.7 業務の実施方針と方法.....	1-8
1.7.1 関連事業・関連機関との連携.....	1-8
1.7.2 ハノイ市における IT 企業等との連携.....	1-9
1.7.3 ワーキンググループの設置.....	1-10
<b>PART 2. プロジェクトの結果</b> .....	<b>2-1</b>
2.1 プロジェクトの結果.....	2-1
2.1.1 日本側からの投入.....	2-1
2.1.1.1 専門家.....	2-1
2.1.1.2 投入機材 (Equipment).....	2-2
2.1.2 ベトナム側からの投入 (Input by Vietnamese side).....	2-2
2.1.2.1 カウンターパートの投入.....	2-2
2.1.2.2 作業環境の準備.....	2-2
2.1.2.3 プロジェクト経費.....	2-3
2.1.2.4 JCC およびワーキンググループミーティング.....	2-3
2.1.2.5 本邦研修.....	2-11
2.2 プロジェクトの達成状況.....	2-13
2.2.1 成果と指標.....	2-13
2.2.1.1 成果 1: 相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」が策定される.....	2-13
2.2.1.2 成果 2: 運賃管理センター（部）の組織 TOR が策定される.....	2-15
2.2.2 プロジェクト目標と指標.....	2-17
2.2.2.1 成果 1.....	2-17
2.2.2.2 成果 2.....	2-17

2.2.2.3 プロジェクト目標の達成状況.....	2-17
<b>2.3 PDM および PO の変更.....</b>	<b>2-19</b>
2.3.1 リスクの変化と軽減.....	2-19
2.3.2 ハノイ市交通局（HDOT）の対応.....	2-19
2.3.3 変更結果.....	2-19
<b>2.4 その他.....</b>	<b>2-19</b>
2.4.1 社会環境配慮.....	2-19
2.4.2 ジェンダー・平和構築・貧困削減.....	2-19
<b>PART 3. ジョイントレビュー結果.....</b>	<b>3-1</b>
<b>3.1 DAC 評価 5 項目についてのジョイントレビュー結果.....</b>	<b>3-1</b>
3.1.1 妥当性.....	3-1
3.1.2 有効性（プロジェクト目標の達成度）.....	3-2
3.1.3 効率性.....	3-4
3.1.4 インパクト.....	3-5
3.1.5 持続性.....	3-5
3.1.5.1 政策と制度面.....	3-5
3.1.5.2 組織的側面.....	3-5
3.1.5.3 財務面.....	3-6
3.1.5.4 技術的側面.....	3-6
<b>3.2 プロジェクトの実施・成果に影響を与えた主な要因.....</b>	<b>3-6</b>
<b>3.3 プロジェクトのリスクマネジメントに対する結果評価.....</b>	<b>3-7</b>
<b>3.4 プロジェクトから得られた知見.....</b>	<b>3-7</b>
<b>PART 4. 上位目標達成に向けた提言.....</b>	<b>4-1</b>
<b>4.1 上位目標達成の見込み.....</b>	<b>4-1</b>
<b>4.2 ベトナム側の上位目標達成に向けた取り組み.....</b>	<b>4-1</b>
<b>4.3 ベトナム側への提言.....</b>	<b>4-1</b>
<b>4.4 プロジェクト終了時から事後評価までのモニタリング計画.....</b>	<b>4-2</b>

## 参考資料

### Appendix: 1 Project Monitoring Sheet

I. Summary (PM Form 3-1 Monitoring Sheet Summary)

II. Project Monitoring Sheet I and II

(PM Form 3-2 Monitoring Sheet I and PM Form 3-3 Monitoring Sheet II)

## 表目次

表 1.5.1: プロジェクトの活動.....	1-4
表 2.1.1: 日本側専門家の投入状況.....	2-1
表 2.1.2: JCC/ワーキンググループミーティング開催概要.....	2-3
表 2.2.1: 成果 1 の活動結果.....	2-13
表 2.2.2: 成果 2 の活動結果.....	2-15
表 2.2.3: 評価指標とプロジェクト成果（成果 1）.....	2-17
表 2.2.4: 評価指標とプロジェクト成果（成果 2）.....	2-17
表 2.2.5: 評価指標と現況.....	2-17
表 2.2.6: 成果・活動別の能力要素.....	2-18
表 3.1.1: JICA プロジェクト評価項目.....	3-1
表 3.1.2: 各アウトプットに対する平均点.....	3-3

## 図目次

図 1.4.1: プロジェクト対象地域.....	1-3
図 1.6.1: プロジェクトの実施体制.....	1-5
図 1.7.1: 本業務に関連する機関.....	1-9
図 1.7.2: ハノイにおける AFC システムの導入予定.....	1-9
図 1.7.3: 本プロジェクトにおけるワーキンググループの構成.....	1-10
図 2.1.1: 提供されたワーキングスペース.....	2-2
図 2.1.2: 第 1 回本邦研修の様子.....	2-12
図 2.1.3: 第 2 回本邦研修の様子.....	2-13
図 2.2.1: セミナーの実施風景.....	2-15
図 3.1.1: アウトプット 1 : 相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」の策定に必要な知識・技能.....	3-3
図 3.1.2: アウトプット 2 : 運賃管理センター（部）の組織 TOR の策定に必要な知識・技能.....	3-4

## 略語表

ADB	Asian Development Bank	アジア開発銀行
AFC	Automated Fare Collection	自動運賃收受システム
BRT	Bus Rapid Transit	バス高速輸送システム
HDOIC	Hanoi Department of Information and Communication	ハノイ市情報通信局
HDOST	Hanoi Department of Science and Technology	ハノイ市科学技術局
HDOT	Hanoi Department of Transport	ハノイ市交通局
HMC	Hanoi Metro Company	ハノイ・メトロ・カンパニー
HPC	Hanoi People's Committee	ハノイ市人民委員会
IC カード	Integrated Circuit Card	情報(データ)の記録や演算をするために集積回路(IC)を組み込んだカード
JCC	Joint Coordinating Committee	合同調整委員会
JICA	Japan International Cooperation Agency	独立行政法人国際協力機構
JET	Japanese Expert Team	日本人専門家チーム
MOIC	Ministry of Information and Communication	情報通信省
MOST	Ministry of Science and Technology	科学技術省
MOT	Ministry of Transport	交通運輸省
MRB	Hanoi Railway Management Board	ハノイ市都市鉄道管理委員会
PDM	Project Design Matrix	プロジェクト・デザイン・マトリックス
PO	Plan of Operation	事業計画
R/D	Record of Discussion	政府間技術協力プロジェクト合意文書
SF	Stored Fare	ストアードフェア。あらかじめ運賃を貯めて(Stored)おいて利用する鉄道用乗車カードのシステムのこと。
SVC	Stored Value Card	ストアードバリューカード。電子マネーの一種で、ICカードに貨幣価値を蓄えて支払いを行うタイプのカードを指す。
TRAMOC	Hanoi Urban Transport Management and Operation Center	都市交通管理サービスセンター
TRANSERCO	Hanoi Transport and Service Corporation	ハノイ運輸総公社
WG	Working Group	ワーキンググループ

## Part 1. プロジェクトの概要

### 1.1 対象国

ベトナム国

### 1.2 プロジェクト名

ベトナム国ハノイ公共交通 IC カード相互利用開発支援プロジェクト【有償勘定技術支援】

### 1.3 プロジェクト実施期間

当初予定期間：2017年12月から2019年12月まで

実際の実施期間：2017年12月から2021年5月まで

プロジェクト実施期間は、下記の理由により1年5ヶ月延長した。

- 第1回JCC（2018年2月2日）においてワーキンググループ（WG）を設立することが合意されたが、最終的にWGメンバーが決定したのは2018年3月末（Decision No. 341/QD-SGTVT dated 29 March 2018）であり、その間に約2ヶ月を要し活動の開始が遅れた。
- 本プロジェクトの活動1の成果品である設計ガイドラインと仕様（以下、DG/TSとする）は、カードベース（CBT）方式を前提としている。そのため、DG/TS基本方針は、ハノイ市の決定文書（Decision 3978/QD-UBND）に従ってCBT方式に基づいて作成され、2019年1月17日にプロジェクトチームからDOTに提出された。一方、ハノイ市から、将来のスマートシティ構想を踏まえ、今後の新しい技術への対応としてABT（Account Based Ticketing）方式について検討してほしいという要望を受けた。これにより、ハノイ市とJICA・JETにおいてCBT-ABTの比較検討を実施し、最終的にCBT方式を採用する結論に至った。2019年1月に提出していたDG/TS基本方針は、CBT-ABTの比較検討の結果を待つこととなり、DG/TS基本方針が承認されたのは提出から約3か月後の2019年4月26日となった。
- DG/TSは、全ての技術的な決定を待っていると作業が進まないため、ベストなオプションについてワーキンググループで議論しつつ作成を進めてきた。ハノイ市側より、運賃支払いのタイミングについて、当初設定していた後払い方式から先払い方式に変更するよう依頼があり、提出を終えていたDG/TSの変更が求められた。日本側で対処方針を検討した結果、ハノイ市の決定に対応するようDG/TSを修正することとした。また、世界的に流行している新型コロナウイルス感染症（COVID-19）の影響により、2020年3月以降は現地ハノイでの活動ができず日本とハノイでの遠隔で活動を進めざるを得ない状況を鑑み、プロジェクト期間を1年間延長した。

## 1.4 プロジェクトの背景

ベトナムにおける交通 IC カードの導入においては、下記に挙げるとおり、日本としてもこれまで多くの取組みがなされてきている。

- 2011年9月：第2回国交省/ベトナム運輸交通省日越交通次官級会合にて、越政府に対して相互利用可能な AFC システムを提案
- 2012年4月～11月：JICA SAPI (Establishment of an Organization for the Operation and Maintenance of Metropolitan Railway Lines in Hanoi City) において AFC システムの相互利用に必要なフレームワークについての調査を実施
- 2012年5月：国交省主催による AFC に関するセミナーをハノイで実施
- 2012年12月～翌年3月：国交省による「ベトナムにおける複数路線での IC 乗車券相互利用及び共通運賃制を実現するための自動運賃収受 (AFC) システムに関する調査」を実施
- 2013年2月：複数路線間での IC 乗車券利用のための「共通技術基準(案)」を国交省からベトナム運輸省科学技術局に提案、合わせて官民ミッションがハノイ市人民委員会に相互利用の重要性及び日本方式の優位性などを説明
- 2013年：JICA 技術協力プロジェクト「ハノイ公共交通改善プロジェクト」において IC カードの導入に向けたパイロットプロジェクトを実施

特に、JICA 技術協力プロジェクト「ハノイ市公共交通改善プロジェクト」でのパイロットプロジェクトでは、日本方式の IC カード 20 万枚が導入され、公共交通における IC カードの認識を深めることに寄与している。ハノイ市では、JICA でのパイロットプロジェクトを受けて本格的な導入の検討を行ってきたが、予算等の問題、本格的なシステムの開発や運用体制が整わず実現に至っていない。

一方、都市鉄道の整備の中でも AFC の検討が進められており、日本が支援する 1 号線や 2 号線は、FeliCa カードを使ったシステム、中国が支援する 2A 号線は MIFARE、フランスと ADB の 3 号線は Calypso のカードの導入が予定されている。こうしたなかでハノイ市としては、相互利用できるシステムを開発するための技術基準を策定することを目的として本プロジェクトの要請がなされた。

本件については 2015 年に詳細計画策定調査が実施された。その後、ハノイ市人民委員会の体制も入れ替わり、新しい指導者の下でスマートシティ政策が進められ、その一環として公共交通へのスマートカード (IC カード) の導入が喫緊の課題となっていた。2017 年 6 月には、BRT1 号線及び路線バスにおける IC カードの導入について、通信会社大手の Viettel 社とハノイのバスを運行する TRANSERCO 社に対して IC カード開発に係る指示が出され、両者によってその開発が進められた。この様な様々な動きがある中で、相互利用のための「設計ガイドラインと仕様」は、ハノイ市のスマートカード導入に当たり、その基礎になるものと期待されている。





出典：JICA プロジェクトチーム

図 1.4.1: プロジェクト対象地域

## 1.5 プロジェクトの概要

### 1.5.1 上位目標

相互利用可能な IC カードがハノイ市のすべての公共交通で利用される。

### 1.5.2 プロジェクト目標

相互利用可能な IC カードシステムの構築に向け、ハノイ市人民委員会のもとにある実施機関の技術及び運営管理能力が向上する。

### 1.5.3 期待される成果と活動

以下に、本プロジェクト終了時点で期待される成果を述べる。

成果 1：相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」が策定される。

成果 2：運賃管理センター（部）の組織 TOR が策定される。

上記の成果に対応する活動の概要は、次表の通りである。

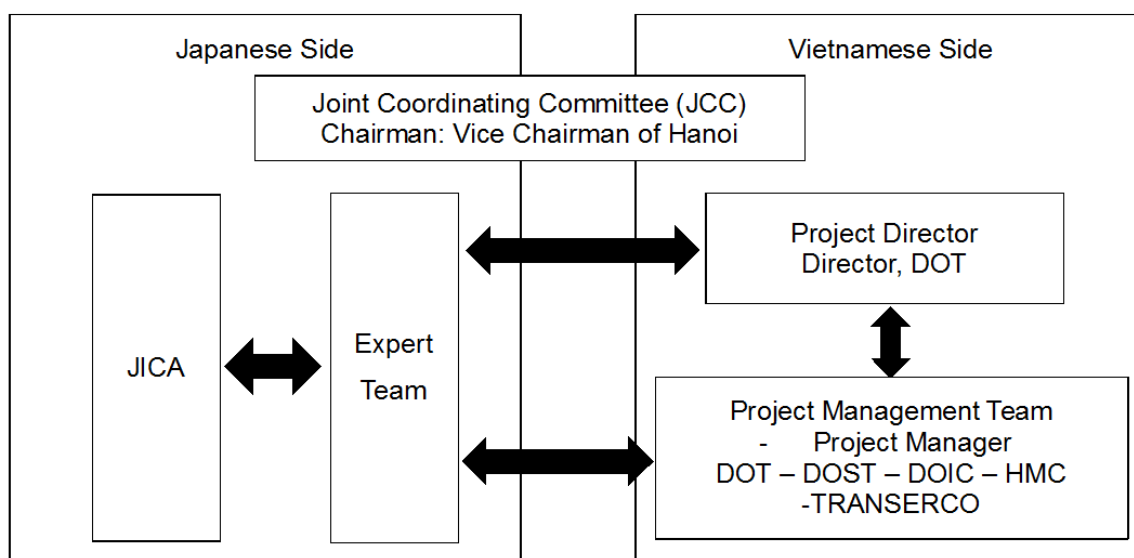
表 1.5.1: プロジェクトの活動

期待される成果	活動の概要
1) 相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」が策定される	活動 1-1：ハノイ市における公共交通 IC カードシステムに関する情報収集と分析 活動 1-2：「設計ガイドラインと仕様」と運賃政策の方針案の作成 活動 1-3：関係機関との協議と「設計ガイドラインと仕様」と運賃政策の方針の確定 活動 1-4：「設計ガイドラインと仕様」と運賃政策の案の作成 活動 1-5：関係機関との協議と「設計ガイドラインと仕様」の確定 活動 1-6：「設計ガイドラインと仕様」と運賃政策の案に関するセミナーの実施
2) 運賃管理センター（部）の組織 TOR が策定される	活動 2-1：運賃管理センター（部）の業務範囲の定義 活動 2-2：運賃管理センター（部）の各部署の職務内容と責任の定義 活動 2-3：運賃管理センター（部）の各部署の職務内容と責任に関する関係機関との協議 活動 2-4：運賃管理センター（部）の組織体制や採用要件を含む、各部署の詳細な職務内容と責任に係る組織 TOR の準備・提出

## 1.6 プロジェクト実施体制

### 1.6.1 プロジェクト運営組織

プロジェクトの実施体制を下図に示す。プロジェクトの実施主体は、ハノイ市人民委員会によって、ハノイ市交通局（HDOT）がメインカウンターパートとして配置され、また関連機関としてハノイ市科学技術局（HDOST）、ハノイ市情報通信局（HDOIC）、ハノイ鉄道会社（HMC）、ハノイ運輸総公社（TRANSERCO）等が配置された。



出典：JICA プロジェクトチーム

図 1.6.1: プロジェクトの実施体制

### 1.6.2 カウンターパート

カウンターパートは本プロジェクトの推進メンバーとして配属され、本プロジェクトに期待される成果ごとのワーキンググループに分かれて活動を行った。ワーキンググループについては「1.7 業務の実施方針と方法」に詳述する。

#### a. ワーキンググループ名

- 【活動 1】 Working Group 1： 運賃制度の検討
- Working Group 2： 運用制度の検討
- Working Group 3： 技術仕様の検討
- 【活動 2】 Working Group 4： 運賃管理センター検討

**b. メンバー**

**1. JCC member:**

1. Mr. Nguyen The Hung, Vice Chairman of HPC, Chairman of JCC
2. Mr. Vu Van Vien, Director of HDOT, Vice Chairman of JCC, Project Director
3. Mr. Vu Ha, Deputy Director of HDOT, Standing Deputy Director of the Project
4. Mr. Tran Ngoc Nam, Deputy Director of HAPI, member
5. Mr. Nguyen Viet Ha, Deputy Director of DOF, member
6. Mr. Pham Trung Chinh, Deputy Director of DoST, member
7. Mr. Nguyen Xuan Quang, Deputy Director of DoIC, member
8. Mr. Nguyen Cong Nhat, Deputy Director General of TRANSERCO, member
9. Mr. Vu Hong Truong, President of Members Council and Director General of HMC, member
10. Mr. Nguyen Hoang Hai, Director of TRAMOC, member
11. Mr. Tran Huu Bao, Head of Planning – Finance Division under HDOT, member
12. Mr. Dao Viet Long, Head of Transport Management Division under HDOT, member

**2. Working Group 01:**

No	Name	Organization	Title	Position in Project
1	Mr. Duong The Binh	TRAMOC	Vice Director	Group Leader
2	Ms. Tran Thi Kim Khue	TRAMOC	Head of Organization – General Affairs Dept	Deputy Group Leader
3	Ms. Pham Thi Thanh Huong	HDOT	Officer of Planning and Financial Division	Deputy Group Leader
4	Mr. Nguyen Tuyen	HDOT	Deputy Head of Transportation Management Division	Group member
5	Mr. Nguyen Dinh Chien	HDOT	Deputy Head of Planning and Financial Division	Group member

**3. Working Group 02:**

No	Name	Organization	Title	Position in Project
1	Mr. Thai Ho Phuong	TRAMOC	Vice Director	Group Leader
2	Mr. Pham Van Viet	TRAMOC	Officer in Science and Technology Division	Deputy Group Leader
3	Ms. Pham Thi Thanh Huong	HDOT	Officer of Planning and Financial Division	Deputy Group Leader
4	Mr. Nguyen Tuyen	HDOT	Deputy Head of Transportation Management Division	Group member
5	Mr. Nguyen Huu Tuyen	Department of Information and Communications, IT Master	Head of Technical and Service Development Division- Hanoi Information Technology and Communication Training Center	Group member

6	Mr. Tran Chung	TRANSERCO	Head of IT Division, Technical Department	Group member
7	Mr. Tran Tuan Hung	HMC Company	Deputy Head of Engineering- Infrastructure Division	Group member

#### 4. Working Group 03:

No	Name	Organization	Title	Position in Project
1	Mr. Pham Thanh Lam	TRAMOC	Deputy Head of Science and Technology Dept	Group Leader
2	Mr. Bui Van Dung	TRAMOC	Officer of Science and Technology Division	Deputy Group Leader
3	Ms. Pham Thi Thanh Huong	HDOT	Officer of Planning and Financial Division	Deputy Group Leader
4	Mr. Tran Chung	TRANSERCO	Head of IT Division, Technical Department	Group member
5	Mr. Nguyen Huu Tuyen	Department of Information and Communications, IT Master	Head of Technical and Service Development Division- Hanoi Information Technology and Communication Training Center	Group member
6	Mr. Le Tran Phong	Department of Science and Technology	Officer of Technology Division	Group member

#### 5. Working Group 04:

No	Name	Organization	Title	Position in Project
1	Ms. Tran Thi Phuong Thao	TRAMOC	Vice Director	Group Leader
2	Ms. Tran Thi Van Huong	TRAMOC	Head of Ticket Management Division	Deputy Group Leader
3	Ms. Pham Thi Thanh Huong	HDOT	Officer of Planning and Financial Division	Deputy Group Leader
4	Ms. Dinh Thi Hong Sim	TRAMOC	Head of Accounting Division	Group member
5	Mr. Ngo Duc Linh	TRAMOC	Deputy Head of Ticket Management Division	Group member
6	Mr. Tran Chung	TRANSERCO	Head of IT Division, Technical Department	Group member
7	Mr. Nguyen Huu Tuyen	Department of Information and Communications, IT Master	Head of Technical and Service Development Division- Hanoi Information Technology and Communication Training Center	Group member

### 1.6.3 JICA プロジェクトチーム

プロジェクトを実行するため JICA プロジェクトチームが派遣された。プロジェクトチームは、16 名の専門家（団員交代を含めると合計 18 名）によって構成された。

- 高木 通雅：総括/都市公共交通
- 大槻 達男：副総括/AFC 技術管理
- 堀内 諭/齋藤 良太：公共交通運賃政策（鉄道）
- 熊井 強：公共交通運賃政策（バス）
- 梅川 智彦：IC カード相互利用計画
- 溝口 直樹：IC カードデータ管理・活用
- 深津 智威：IC カード相互利用システム（鉄道）
- 田中 昭彦：IC カード相互利用システム（バス）1
- 宮原 秀典：IC カード相互利用システム（バス）2
- 本田 孝哉：情報通信システム
- 桑野 英樹/渡部 泰匡：運賃管理システム（AFC 技術仕様）1
- 平松 広太郎：運賃管理システム（AFC 技術仕様）2
- 中村 健一：運賃管理システム（IC カード及びリーダーライター技術仕様）
- 佐久間 敦：組織制度
- 坂本 有佳理：運賃管理システム（上位システム）
- 大野 学：モニタリング評価/本邦研修/業務調整

## 1.7 業務の実施方針と方法

### 1.7.1 関連事業・関連機関との連携

ハノイ市で作成されるガイドラインや仕様がベトナムの他都市（例えばホーチミン市）での AFC システムに活用されるためには中央政府機関の交通運輸省（MOT）、科学技術省（MOST）、情報通信省（MOIC）などとの連携も必要である。このほか、整備を支援している世界銀行（WB）やアジア開発銀行（ADB）、フランスなどの国際機関やそれらの下で AFC を開発している企業などとの調整や連携も必要となる。そこで、日常的な活動はハノイ市関連のカウンターパートを中心として、国の機関や国際機関を含めた他の機関とはセミナーなどを通じてコミュニケーションを図った。

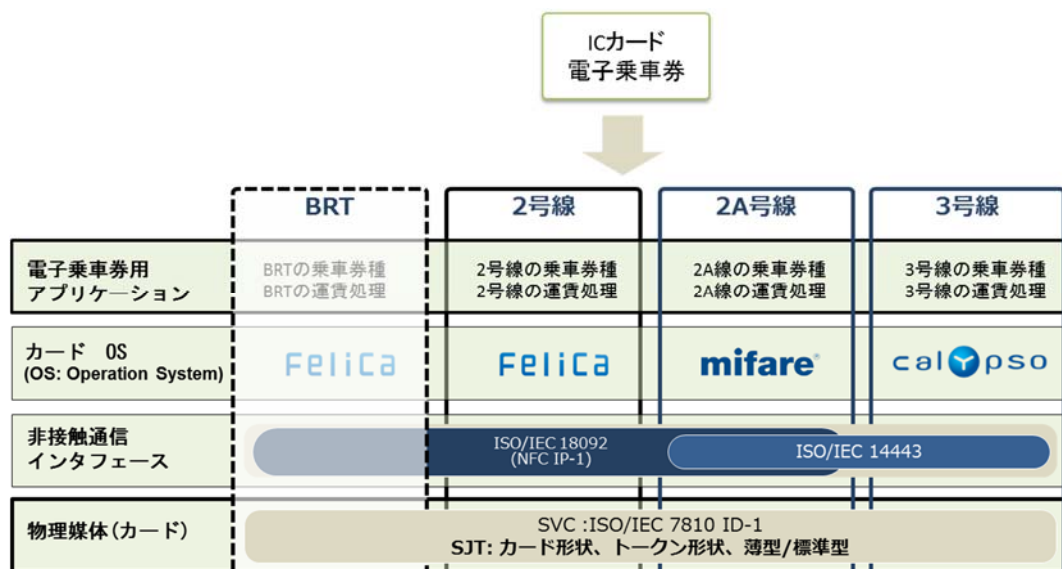
		1号線	2号線	2A号線	3号線	BRT	路線バス	備考
行政機関	国	交通運輸省:MOT(科学技術局:DOST) 科学技術省:MOST 情報通信省:MOIC						国家規格とするためには中央省庁の承認が必要
	地方	ハノイ人民委員会:HPC ハノイ科学技術局:HDOST ハノイ情報通信局:HDOIC						ハノイの交通ICカードについては交通局が担当するが、HDOST及びHDOICの承認が必要。なお、HDOST及びHDOICはそれぞれMOST及びMOICの出先機関にもなっている。
整備主体	ベトナム 鉄道: VNR	ハノイ都市鉄道管理局:MRB				ハノイ交通局:HDOT		交通サービスセンター:TRAMOC
運営主体		ハノイメトロ:HMC				ハノイ運輸総社:TRANSERCO		ハノイ市よりVitelte社とTRANSERCO社に対しBRT及び路線バスへのICカード導入を指示
国際機関		JICA	中国	仏・ADB	WB			

出典：JICA プロジェクトチーム

図 1.7.1: 本業務に関連する機関

### 1.7.2 ハノイ市における IT 企業等との連携

ハノイ市の指示のもとで、民間企業グループ（大手通信会社 Viettel 社とバス事業者の TRANSERCO 社）により BRT と路線バスに係る AFC システムの開発が進められている。こうした民間企業グループとも適切な連携を図り、相互に手戻りが発生しないよう留意して取り組むことが重要である。本プロジェクトでは、ハノイ市における IT 企業の技術者もプロジェクトメンバーに加わり、技術仕様書を作成した。なお、現在導入が予定されている AFC システムは下図のようになっている。



出典：JICA プロジェクトチーム

図 1.7.2: ハノイにおける AFC システムの導入予定

### 1.7.3 ワーキンググループの設置

本プロジェクトのアウトプットの活用においては、システム設計の具体的な内容を検査する組織、ガイドラインや仕様を運用管理する組織、運営事業者としてシステムを利用し保守管理を行う組織など、各組織によって修得すべき知識が異なる。そのため、下記のようなワーキンググループを設定して、技術移転を図るものとする。この WG 会議において具体・詳細な検討を行い、カウンターパート機関の理解を高めながらプロジェクトを進行した。WG 会議は合計 189 回実施した。



出典：JICA プロジェクトチーム

図 1.7.3: 本プロジェクトにおけるワーキンググループの構成



## Part 2. プロジェクトの結果

### 2.1 プロジェクトの結果

#### 2.1.1 日本側からの投入

##### 2.1.1.1 専門家

16 名からなる専門家チームをハノイ市に派遣し、プロジェクトの活動を実施した。プロジェクト終了となる 2021 年 3 月末までに、JICA プロジェクトチームは 67.30 人月 (MM) を投入した。

表 2.1.1: 日本側専門家の投入状況

専門分野	氏名	人月	
		計画	実績
総括/都市公共交通	高木 通雅	7.70	8.70
副総括/AFC 技術管理	大槻 達男	10.60	10.60
公共交通運賃政策 (鉄道)	堀内 諭	2.92	2.92
	齋藤 良太	3.58	2.58
公共交通運賃政策 (バス)	熊井 強	3.00	3.00
IC カード相互利用計画	梅川 智彦	1.20	1.22
IC カードデータ管理・活用	溝口 直樹	1.00	0.00
IC カード相互利用システム (鉄道)	深津 智威	5.00	5.02
IC カード相互利用システム (バス) 1	田中 昭彦	3.50	3.50
IC カード相互利用システム (バス) 2	宮原 秀典	3.00	3.00
情報通信システム	本田 孝哉	3.50	3.50
運賃管理システム (AFC 技術仕様) 1	桑野 英樹	0.57	0.57
	渡部 泰匡	9.03	10.03
運賃管理システム (AFC 技術仕様) 2	平松 広太郎	0.50	0.50
運賃管理システム (IC カード及びリーダーライター技術仕様)	中村 健一	1.00	0.00
組織制度	佐久間 敦	1.50	1.50
運賃管理システム (AFC 上位システム)	坂本 有佳理	1.00	1.50
モニタリング評価/本邦研修/業務調整	大野学	8.70	9.16
	合計 MM	67.30	67.30

### 2.1.1.2 投入機材 (Equipment)

下記の機材を購入し、プロジェクト活動の実行に供した。また、プロジェクト終了後はカウンターパート (DOT) へ供与した。

- Projector (01)
- Desktop Computer with MS Software (02)
- Monitor (02)
- Antivirus Software (03)
- Laptop (02)
- Wifi Router (01)
- Webcam (02)
- Speaker (01)
- Portable Charger (01)

### 2.1.2 ベトナム側からの投入 (Input by Vietnames side)

#### 2.1.2.1 カウンターパートの投入

1.6.2 カウンターパートに記載のとおり、29 名がプロジェクトにカウンターパートとしてアサインされた。

#### 2.1.2.2 作業環境の準備

カウンターパートは JICA プロジェクトチームへ、必要な設備を備えたワーキングスペースを提供した。



プロジェクトオフィス



プロジェクトオフィス (会議室)

出典: JICA プロジェクトチーム

図 2.1.1:提供されたワーキングスペース

### 2.1.2.3 プロジェクト経費

DOT は以下の経費を負担した。

- カウンターパート人件費
- プロジェクトオフィスの維持管理
- その他（ベトナム人メンバーのベトナム国内における移動コスト等）

### 2.1.2.4 JCC およびワーキンググループミーティング

プロジェクト期間中、合同調整委員会（JCC）が5回、およびワーキンググループミーティングが定期的に行われた。

表 2.1.2: JCC/ワーキンググループミーティング開催概要

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
1	First JCC meeting	2 February 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Outline of Work Plan (Draft) 2) Confirmation of the Undertakings by Vietnamese Side
2	Second JCC Meeting	22 August 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Progress of the project 2) Proposal from WG 3) Items to be confirmed by Hanoi-city 4) Activity plans
3	Third JCC Meeting	7 November 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Achievements in the 1st Year 2) Explanation for Outline of 'Design Guideline and Specifications 'and Fare Policy 3) Activities in Next Period
4	Fourth JCC Meeting	29 August 2019	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Report about Project Implementation 2) Remaining Items 3) Plan/Procedure to obtain appraisal, approval on Design Guidelines and Technical Specifications 4) Proposal on AFC system implementation under the city bus network (applying Project outputs) 5) Proposal about Project extension
5	Fifth JCC Meeting	25 March 2021	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) JICA Project Evaluation 2) Presentation on the Project Results 3) Development for Smart Card System for Public Transportation in Hanoi city

ワーキンググループ間及び外部組織との会議

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
1	1st WG Leader Meeting	23 August 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Ideal AFC Model in Hanoi 2) Confirmation of 2nd JCC
2	2nd WG Leader Meeting	4 December 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Progress of the project since last JCC meeting 2) Response to the notice by HPC 3) Confirmation of the materials and preparations for the seminar
3	3rd WG Leader Meeting	6 December 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Reflection of the seminar for the formulation of Outline Report 2) Site Visit at TRAMOC (Bus Operator) Demo for Bus unit
4	JICA-JET meeting for the fourth JCC meeting	23 August 2019	JICA Headquarters, JICA Viet Nam Office, JICA Expert Team	1) Topics and materials in JCC meeting
5	Inter-Working Group Meeting	29 August 2019	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Transfer discount 2) Valid period of season passes
6	Inter-Working Group Meeting (JET only)	3 October 2019	JICA Expert Team	1) Confirmation of draft DG/TS
7	Inter-Working Group Meeting	3 October 2019	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Confirmation of remaining items
8	Orientation Meeting	4 October 2019	JICA Headquarters, JICA Viet Nam Office, JICA Expert Team	1) Confirmation on how to develop outputs and schedule
9	General Meeting with JICA	7th October 2019	JICA Headquarters, JICA Expert Team	1) Contents of outputs and the seminar
10	Inter-Working Group Meeting (JET only)	27th November 2019	JICA Expert Team	1) Review of the seminar and orientation
11	Meeting with HDOT	29th November 2019	HDOT, JICA Expert Team	1) Schedule of the project
12	Meeting with HDOT and TRAMOC	25th December 2019	HDOT, TRAMOC, JICA Expert Team	1) Schedule of the project 2) Confirmation on remaining items 3) Training in Japan
13	Meeting at Ho Chi Minh City	16th January 2020	HCMC-DOT, MAUR, HCMC-Metro, JICA, WB, NJPT, JICA Expert Team	1) Opinion exchange about interoperable use of IC card

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
14	JET Meeting	13th February 2020	JICA Expert Team	1) Confirmation of revision policy of the DG/TS
15	Meeting with HDOT	12th August 2020	HDOT, JICA Expert Team	1) Revision of RD, project schedule, etc. caused by change in project period
16	Inter-Working Group Meeting (JET only)	1st September 2020	JICA Expert Team	1) Confirmation of revision of the DG/TS by each Working Group 2) Confirmation on topics to be discussed among WGs 3) Confirmation on schedule
17	WG1-WG3 meeting (JET only)	3rd September 2020	WG1 and WG3 members of JICA Expert Team	1) Confirmation on how to deal with the case where passengers alight buses without tapping their IC cards
18	WG1-WG3 meeting (JET only)	15th September 2020	WG1 and WG3 members of JICA Expert Team	1) Final confirmation on revised parts of the DG/TS

セミナー

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
1	1st Seminar	5 December 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Project Overview and Introduction of Basic Approach on Interoperable Smart Card System for Public Transportation in Hanoi
2	2nd Seminar	27th November 2019	HDOT, HDOT, HDOST, HDOIC, SBV, HMC, TRANSERCO, MOT, TRAMOC. Construction Association, BIDV, IT Agribank, Vietcombank, Viettel, MK Group, ITD, VNPT, NAPAS, ADB, WB, ABeam Consulting (Vietnam), Viet Nam Tokyo Metro, TOPPAN FORMS, Sony Imaging Products & Solutions, Sony Electronics Vietnam, JCB International	1) Overview of the draft DG/TS

ワーキンググループ1 ミーティング

No.	Date	Subject
1	16th Apr, 2018	<ul style="list-style-type: none"> <li>Outline of the expected output of WG1</li> <li>Confirmation of the activity schedule</li> </ul>
2	29rd May, 2018	<ul style="list-style-type: none"> <li>Explanation of the Fare Management System in Japan</li> </ul>
3	30th May, 2018	<ul style="list-style-type: none"> <li>Discussion on the feasibility to install each system into Hanoi</li> </ul>
4	5th Jun, 2018	<ul style="list-style-type: none"> <li>Explanation of the Fare Management System in other countries</li> </ul>
5	25th Jul, 2018	<ul style="list-style-type: none"> <li>Clarification of the items to be discussed</li> <li>Discussion on the reporting to the 2nd JCC</li> </ul>

6	19th Sep, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents of outline report</li> </ul>
7	20th Sep, 2018	<ul style="list-style-type: none"> <li>Explanation of transfer discount in other countries</li> </ul>
8	28th Nov, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents of seminar</li> <li>Confirmation of items to be discussed in the upcoming WG1</li> </ul>
9	7th Dec, 2018	<ul style="list-style-type: none"> <li>Confirmation of distance-based fare</li> <li>Discussion on ticket type</li> </ul>
10	14th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion on the way of transfer discount</li> </ul>
11	17th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion on ticket types and information on card surface</li> </ul>
12	22nd Jan, 2019	<ul style="list-style-type: none"> <li>Confirmation of the result of discussion and table of contents of the output</li> </ul>
13	26th Feb, 2019	<ul style="list-style-type: none"> <li>Confirmation of contents of fare system guideline (proposed)</li> </ul>
14	14th Mar, 2019	<ul style="list-style-type: none"> <li>Confirmation of the comment from Vietnamese side against fare system guideline (proposed)</li> </ul>
15	20th Mar, 2019	<ul style="list-style-type: none"> <li>Reconfirmation of the whole structure of outputs in line with the work plan</li> <li>Confirmation of the tasks from April</li> </ul>
16	25th Mar, 2019	<ul style="list-style-type: none"> <li>Confirmation of the response toward the comments from Vietnamese side against fare system guideline (proposed)</li> </ul>
17	13rd Jun, 2019	<ul style="list-style-type: none"> <li>Discussion on how to deal with fare system guideline</li> </ul>
18	18th Jun, 2019	<ul style="list-style-type: none"> <li>Leader meeting with Mr. Binh (vice director of TRAMOC)</li> </ul>
19	16th Jul, 2019	<ul style="list-style-type: none"> <li>Discussion on how to deal with fare system guideline</li> </ul>
20	23rd Aug, 2019	<ul style="list-style-type: none"> <li>Discussion on how to deal with fare system guideline</li> </ul>
21	4th Oct, 2019	<ul style="list-style-type: none"> <li>Discussion and Confirmation on draft technical cooperation outputs</li> </ul>
22	24th Oct, 2019	<ul style="list-style-type: none"> <li>Confirmation on outputs with WG3 (JICA Expert Team only)</li> </ul>
23	31st Oct, 2019	<ul style="list-style-type: none"> <li>Arrangement and material of the seminar (JICA Expert Team only)</li> </ul>
24	25th Nov, 2019	<ul style="list-style-type: none"> <li>Discussion on contents of the seminar</li> </ul>
25	20th Aug, 2020	<ul style="list-style-type: none"> <li>Confirmation on revision policy of the DG/TS and schedule</li> </ul>
26	26th Aug, 2020	<ul style="list-style-type: none"> <li>Confirmation on draft revision of the DG/TS and schedule</li> </ul>

ワーキンググループ 2 ミーティング

No.	Date	Subject
1	12th Apr, 2018	<ul style="list-style-type: none"> <li>Procedure on WG2 activities "Development of Operational Specification"</li> <li>Explanation of the draft proposal of the list of Operational Specification</li> <li>Outline of the expected final output of WG2</li> <li>Confirmation of the activity schedule</li> </ul>
2	13rd Apr, 2018	<ul style="list-style-type: none"> <li>Outline of the expected final output of the Operational Specification</li> <li>Confirmation of the activity schedule</li> </ul>
3	30th May, 2018	<ul style="list-style-type: none"> <li>Explanation of the draft proposal of the list of Operational Specification</li> <li>Re-issue and re-issue registration (Assignment)</li> <li>Card life cycle</li> </ul>
4	31st May, 2018	<ul style="list-style-type: none"> <li>Boarding and Alighting from railway, BRT and bus</li> </ul>
5	21st June, 2018	<ul style="list-style-type: none"> <li>Discussion on the Operational Specification</li> </ul>
6	5th July, 2018	<ul style="list-style-type: none"> <li>Interview about operation of railway, BRT and bus</li> </ul>
7	21st Aug, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents of outline report</li> </ul>
8	6th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on the operational flow in the use of interoperable IC card</li> </ul>
9	8th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on the operational flow in the use of interoperable IC card</li> </ul>

10	4th Dec, 2018	• Discussion on the operational flow in the use of interoperable IC card
11	18th Dec, 2018	• Discussion on the operational flow in the use of interoperable IC card
12	22nd Jan, 2019	• Discussion on the operational flow in the use of interoperable IC card
13	24th Jan, 2019	• Discussion on the operational flow in the use of interoperable IC card
14	26th Mar, 2019	• Discussion on the operational flow in the use of interoperable IC card
15	29th May, 2019	• Discussion on the operational flow in the use of interoperable IC card
16	26th Jun, 2019	• Discussion on the operational flow in the use of interoperable IC card
17	24th Jul, 2019	• Discussion on the operational flow in the use of interoperable IC card
18	28th Aug, 2019	• Discussion on the operational flow in the use of interoperable IC card
19	30th Oct, 2019	• Discussion on the DG/TS regarding the use of interoperable IC card
20	31st Oct, 2019	• Discussion on the DG/TS regarding the use of interoperable IC card
21	26th Nov, 2019	• Discussion on contents of the seminar
22	19th Dec, 2019	• Discussion on the fare deduction method
23	14th Jan, 2020	• Discussion on the fare deduction method
24	27th Aug, 2020	• Discussion on revision policy of the DG/TS and schedule
25	22th Sep, 2020	• Confirmation on revision of the WG2 documents via email

### ワーキンググループ3 ミーティング

No.	Date	Subject
1	12th Apr, 2018	<ul style="list-style-type: none"> <li>• Discussion on WG3 activity planning                             <ul style="list-style-type: none"> <li>➢ Confirmation on WBS, operation plan</li> <li>➢ Sharing the target deliverables of WG3 (AFC technical specification)</li> <li>➢ Review on AFC system interoperable use</li> </ul> </li> </ul>
2	13th Apr, 2018	<ul style="list-style-type: none"> <li>• Lecture for understanding of AFC system, basic terms and structure</li> <li>• Review and discussion on Hanoi AFC technical framework (3978) from interoperable perspective.</li> </ul>
3	21st May, 2018	<ul style="list-style-type: none"> <li>• Explanation of AFC survey report on public transportation interoperability in Hanoi City. (BRT, Line2A, Line3, laws and regulations)</li> <li>• Review on overview on AFC technical specification and IC card issuance process</li> <li>• Procedure on WG3 activities and planning for upcoming 3 months</li> </ul>
4	22nd May, 2018	<ul style="list-style-type: none"> <li>• Understanding of AFC technical specification                             <ul style="list-style-type: none"> <li>➢ Explanation and discussion on each AFC technical specification item. (ticket media, R/W, Smartcard IC format, encoding process/format, common code, ticket validation, transaction data and set value, black list, trip pattern, host system)</li> </ul> </li> </ul>
5	23rd May, 2018	
6	24th May, 2018	
7	25th May, 2018	
8	28th May, 2018	
9	29th May, 2018	
10	30th May, 2018	
11	4th June, 2018	• Review of proposal of FMC by TRAMOC (2015):
12	8th June, 2018	• Framework of Technical Specification for Host System
13	11th June, 2018	<ul style="list-style-type: none"> <li>• Clarification key points of AFC interoperable technical specification for Hanoi                             <ul style="list-style-type: none"> <li>➢ Acquire the important key point for AFC technical specification to be introduced in Hanoi city</li> </ul> </li> </ul>
14	13th June, 2018	
15	15th June, 2018	

No.	Date	Subject
16	19th June, 2018	➤ Listing up the discussion items with other WGs.
17	26th June, 2018	
18	27th June, 2018	
19	29th June, 2018	
20	4th July, 2018	
21	27th June, 2018	• MK smart factory visit for IC card manufacturing tour and study on interoperable bus R/W.
22	19th July, 2018	• Review of Drafted outline of AFC technical specification.
23	23rd July, 2018	➤ Create and review draft version of outline of AFC technical specification.
24	23rd July, 2018	• Visit to HMC ➤ Technical Information of Line 2A ➤ Communication with HMC
25	24th July, 2018	• Review of Drafted outline of AFC technical specification.
26	31st July, 2018	• Review of BRT document from Viettel (rev3.2)
27	31st July, 2018	• Review Host system of Drafted outlines of Technical Specification (ver. 0.12)
28	24th July, 2018	• Review BRT AFC document from Viettel • On site review of demonstration of AFC system for pilot test and confirmation of technical details with Transerco-Viettel BRT project members • Review on summary of main point discussed and Study of coping plan • Joint meeting with WG1, WG2 and WG4 to shaping consensus on main point discussed proposed by WG3
29	27th July, 2018	
30	8th Aug, 2018	
31	10th Aug, 2018	
32	14th Aug, 2018	
33	16th Aug, 2018	
34	21st Aug, 2018	• Confirmation of the contents to be reported in JCC (Discussion on role sharing in formulation of the technical specifications)
35	24th Aug, 2018	• Discussion on host system specifications
36	7th Sep, 2018	• Discussion on contents and sharing of work between Japanese and Vietnamese sides in formulation of the technical specifications (common code)
37	3rd Oct, 2018	• Discussion on common code
38	5th Oct, 2018	• Discussion on common code and Blacklist
39	5th Nov, 2018	• Site visit at depots of three local bus company(1). Investigation was conducted in terms of infrastructure related to system and network and amount of data to be dealt with at each depot, for the purpose of establishment of AFC system suitable for the actual bus operation. : Nam Ha Noi Bus company,
40	5th Nov, 2018	• Site visit at depots of three local bus companies(2): Cau Buou bus company (142 bus, 11 line)
41	5th Nov, 2018	• Site visit at depots of three local bus company (3): Tan Dat bus company (68 bus, 5 line))
42	6th Nov, 2018	• Confirmation of contents of JCC meeting • Discussion on technical specifications (Ticket media)
43	8th Nov, 2018	• Discussion on proposed AFC system structure suitable for bus services



No.	Date	Subject
44	9th Nov, 2018	<ul style="list-style-type: none"> <li>• Site visit at Line 2A. Inspection of installed AFC facility, IC card and operation, and investigation for tasks to be tackled for formulation of common specifications are conducted.</li> <li>• Survey of actual AFC trial operation in BRT</li> </ul>
45	9th Nov, 2018	<ul style="list-style-type: none"> <li>• Discussion on JCC 3rd result in WG3</li> </ul>
46	20th Nov, 2018	<ul style="list-style-type: none"> <li>• Discussion on common code and gate access log</li> </ul>
47	28th Nov, 2018	<ul style="list-style-type: none"> <li>• Discussion on specifications for common code, which is used to process data in interoperable use</li> </ul>
48	7th Dec, 2018	<ul style="list-style-type: none"> <li>• Technical Specifications (discussion on encode format)</li> </ul>
49	17th Dec, 2018	<ul style="list-style-type: none"> <li>• Discussion on the contents of outline report</li> </ul>
50	19th Dec, 2018	<ul style="list-style-type: none"> <li>• Discussion on the contents of outline report</li> </ul>
51	21st Dec, 2018	<ul style="list-style-type: none"> <li>• Technical Specifications (discussion on encode format)</li> </ul>
52	25th Dec, 2018	<ul style="list-style-type: none"> <li>• Discussion on the contents of outline report</li> </ul>
53	11th Jan, 2019	<ul style="list-style-type: none"> <li>• Discussion through Skype on technical Specifications (common code, format)</li> </ul>
54	16th Jan, 2019	<ul style="list-style-type: none"> <li>• Discussion through Skype on technical Specifications (reader/writer)</li> </ul>
55	17th Jan, 2019	<ul style="list-style-type: none"> <li>• Discussion through Skype on technical Specifications (encode process)</li> </ul>
56	22nd Jan, 2019	<ul style="list-style-type: none"> <li>• Discussion through Skype on technical Specifications (trip pattern)</li> </ul>
57	24th Jan, 2019	<ul style="list-style-type: none"> <li>• Discussion through Skype on technical Specifications (host system)</li> </ul>
58	28th Jan, 2019	<ul style="list-style-type: none"> <li>• Discussion on schedule of further WG3 activities</li> </ul>
59	19th Feb, 2019	<ul style="list-style-type: none"> <li>• Discussion on installation of IC card in buses with TRANSERCO</li> </ul>
60	20th Feb, 2019	<ul style="list-style-type: none"> <li>• Discussion on work plan and role sharing in 2019</li> <li>• Confirmation of list of tasks and role sharing in formulation of technical specifications</li> </ul>
61	20th Feb, 2019	<ul style="list-style-type: none"> <li>• Review of project with Mr.Hai (extension of project and other discussions)</li> </ul>
62	20th Feb, 2019	<ul style="list-style-type: none"> <li>• Interview with NAPAS about how to apply IC card to other transport</li> <li>• Discussion with Ms. Huong on tasks and solutions in the process of project</li> </ul>
63	17th Apr, 2019	<ul style="list-style-type: none"> <li>• Site visit at Payoo Corporation to survey the situation of Fintech, which is used for ABT system</li> <li>• Site visit at pilot trial at Ho Chi Minh bus, in which ABT system is installed (create an account of ZaloPay, apply for UniPass, issue IC card, take a bus)</li> <li>• Sharing opinion with iTD Company, one of the most promising IT company in Vietnam, about ABT and CBT in the structure of AFC system</li> </ul>
64	19th Apr, 2019	<ul style="list-style-type: none"> <li>• Discussion with Vietnamese members about the main text of technical specifications                             <ul style="list-style-type: none"> <li>➢ Confirmation of progress in outline (to be tackled after conclusion of HPC meeting)</li> </ul> </li> </ul>
65	22nd Apr, 2019	<ul style="list-style-type: none"> <li>• Discussion with Vietnamese members about the main text of technical specifications                             <ul style="list-style-type: none"> <li>➢ Confirmation of items, schedule and role sharing</li> <li>➢ Vietnamese side raised a problem in lack of resources to be used for contents confirmation</li> </ul> </li> </ul>
66	24th Apr, 2019	<ul style="list-style-type: none"> <li>• Sharing opinion with R&amp;D sector, NAPAS</li> </ul>
67	28th May, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for common code</li> </ul>
68	30th May, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for common code</li> </ul>

No.	Date	Subject
69	4th June, 2019	• Detailed review of specifications for common code and Encode Format
70	6th June, 2019	• Detailed review of specifications for Encode Format
71	11th June, 2019	• Detailed review of specifications for Encode Format
72	13th June, 2019	• Detailed review of specifications for Ticket Media
73	18th June, 2019	• Detailed review of specifications for R/W and Ticket Validation
74	20th June, 2019	• Detailed review of specifications for Ticket Validation
75	2nd July, 2019	• Detailed review of specifications for Ticket Validation
76	4th July, 2019	• Detailed review of specifications for Ticket Validation
77	9th July, 2019	• Detailed review of specifications for Encode Data
78	18th July, 2019	• Detailed review of specifications for Encode Data
79	23rd July, 2019	• Detailed review of specifications for Encode Data
80	25th July, 2019	• Detailed review of specifications for Encode Data
81	30th July, 2019	• Detailed review of specifications for Encode Data
82	6th Aug, 2019	• Detailed review of specifications for Transaction Data
83	8th Aug, 2019	• Detailed review of specifications for Transaction Data
84	20th Aug, 2019	• Detailed review of specifications (Station code) on request of Hanoi member
85	22th Aug, 2019	• Detailed review of specifications (Station code) on request of Hanoi member
86	27th Aug, 2019	• Detailed review of specifications for Transaction Data and Trip Pattern
87	10th Sep, 2019	• Discussion on project planning
88	10th Sep, 2019	• Detailed review of specifications for Host System and Trip Pattern
89	12th Sep, 2019	• Detailed review of specifications for Trip Pattern
90	17th Sep, 2019	• Detailed review of specifications for Trip Pattern
91	19th Sep, 2019	• Explanation contents and structure of Main report
92	24th Sep, 2019	• Review report of Host System
93	1st Oct, 2019	• Discussion on bus stop code
94	3rd Oct, 2019	• Review main report of WG3
95	15th Oct, 2019	• Pre-discussion on bus stop code (JICA Expert Meeting only)
96	17th Oct, 2019	• Discussion on bus stop code
97	5th Nov, 2019	• Discussion on contents of the seminar in WG3
98	12th Nov, 2019	• Preparation and review on seminar material
99	26th Nov, 2019	• Rehearsal of the seminar and check of the contents
100	26th Dec, 2019	• Bus stop code structure and confirmation on reflection of the comments at the seminar
101	18th Aug, 2020	• Confirmation on revision of the DG/TS (revised parts, basic concept)
102	20th Aug, 2020	• Confirmation on revised contents of the DG/TS (confirmation on involved member in the revision and schedule with Ms. Huong (HDOT))
103	27th Aug, 2020	• Confirmation on revised contents of the DG/TS (encode format and ticket validation)
104	3rd Sep, 2020	• Confirmation on revised contents of the DG/TS (encode data)

No.	Date	Subject
105	10th Sep, 2020	<ul style="list-style-type: none"> <li>Confirmation on revised contents of the DG/TS (transaction data format and transaction data encode)</li> </ul>
106	17th Sep, 2020	<ul style="list-style-type: none"> <li>Confirmation on revised contents of the DG/TS (trip pattern)</li> </ul>
107	24th Sep, 2020	<ul style="list-style-type: none"> <li>Confirmation on revised contents of the DG/TS (main body of the DG/TS)</li> <li>Q&amp;A about the DG/TS</li> </ul>

ワーキンググループ 4 ミーティング

No.	Date	Subject
1	21st Aug, 2018	<ul style="list-style-type: none"> <li>Confirmation of contents of outline report</li> </ul>
2	5th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on organizational structure and staffing requirements under FMC</li> </ul>
3	6th Dec, 2018	<ul style="list-style-type: none"> <li>Discussion on organizational structure and staffing requirements under FMC</li> </ul>
4	19th Dec, 2018	<ul style="list-style-type: none"> <li>Discussion on organizational structure and staffing requirements under FMC</li> </ul>
5	21st Dec, 2018	<ul style="list-style-type: none"> <li>Discussion on contents of outline report</li> </ul>
6	23rd Jan, 2019	<ul style="list-style-type: none"> <li>Discussion on organizational structure and staffing requirements under FMC</li> </ul>
7	27th Mar, 2019	<ul style="list-style-type: none"> <li>Discussion on organizational structure and staffing requirements under FMC</li> </ul>
8	30th May, 2019	<ul style="list-style-type: none"> <li>Discussion on organizational structure and staffing requirements under FMC</li> </ul>
9	27th Jun, 2019	<ul style="list-style-type: none"> <li>Discussion on terms of reference detailing the specific tasks and responsibilities of each unit under FMC</li> </ul>
10	25th Jul, 2019	<ul style="list-style-type: none"> <li>Discussion on terms of reference detailing the specific tasks and responsibilities of each unit under FMC</li> </ul>
11	28th Aug, 2019	<ul style="list-style-type: none"> <li>Discussion on staffing requirement of FMC</li> </ul>
12	26th Sep, 2019	<ul style="list-style-type: none"> <li>Discussion on staffing requirement of FMC</li> </ul>
13	19th Dec, 2019	<ul style="list-style-type: none"> <li>Confirmation on Organizational TOR of FMC</li> </ul>

#### 2.1.2.5 本邦研修

プロジェクト期間中に本邦研修を 2 回実施した。詳細を以下に記す。

- a. 第 1 回本邦研修は、日本における IC カード相互利用の現状の把握と、相互利用における課題・各事業者による工夫を学ぶことを目的に、2018 年 5 月 6 日から 5 月 17 日にかけて実施された。研修参加者は以下の 4 名である。
- Mr. Vu Ha - HDOT, Deputy General Director
  - Mr. Nguyen Hoang Hai - TRAMOC, General Director
  - Mr. Nguyen Thai Dong - HDPI, General planning department, Deputy Director
  - Mr. Le Tran Phong - DOST, science management department, officer

研修の内容は以下の通りである。

- 日本及び諸外国での IC カード利用状況 (ITS-AP 2018 福岡フォーラムに参加)
- バス営業所における IC カードシステム運用の理解
- 交通ターミナルや商業施設、観光施設等の IC カードシステム活用事例の視察

- 鉄道における IC カード利用の現状と今後の展開（相互利用に着目して）



出典：JICA プロジェクトチーム

図 2.1.2: 第 1 回本邦研修の様子

- b. 第 2 回の研修は、日本の IC カード相互利用の実態や地域特性に合わせた運用状況等を学び、プロジェクトへの活用、ハノイ市への適応について考察することを目的に、2020 年 2 月 17 日から 2 月 27 日にかけて実施された。研修参加者は以下の 5 名である。
- DUONG THE BINH - HDOT, Deputy Head of Transport Infrastructure Management Division
  - BUI XUAN QUYET THANG - TRANSERCO, Deputy Head of Bus Operation Center
  - NGUYEN HUU QUANG - TRAMOC, Deputy Head of Science Technology Division,
  - TRAN TUAN HUNG - HMC, Deputy Head of Engineering- Infrastructure Division
  - NGUYEN HUU TUYEN - DOIC, Head of Technical and Service Development Division
- 研修内容を以下に示す。
- 全国相互利用 IC カード（nimoca）の概要
  - 博多自動車営業所の視察、福岡市内のバス・鉄道の乗り継ぎ体験
  - ことでんグループ IC カード IruCa の概要及び導入後の施策展開、課題や対策（街の活性化）

- Suica 誕生の経緯および IC カード全国相互利用の概要、Suica 関連施設の現場視察
- 鉄道の運行管理、人材育成等の視察



西日本鉄道・博多自動車営業所の視察

ことでんバス本社のバス料金精算のブースで、  
バス車載器の精算の説明を受ける

JR 東日本本社での講義

東京メトロ 総合研修訓練センター

出典：JICA プロジェクトチーム

図 2.1.3: 第 2 回本邦研修の様子

## 2.2 プロジェクトの達成状況

### 2.2.1 成果と指標

2.2.1.1 成果 1: 相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」が策定される

成果 1 にかかる活動の結果を下表に記す。

表 2.2.1: 成果 1 の活動結果

活動・ワークアイテム No.	活動状況	結果
1-1: ハノイ市における公共交通 IC カードシステムに関する情報収集と分析	- 公共交通 IC カードシステムに関する、以下の情報を収集した。 ✓ スマートカードシステムの法制度と基準 ✓ スマートカードシステムの設計資料	- 完了

活動・ワークアイテム No.	活動状況	結果
	<ul style="list-style-type: none"> <li>✓ 相互運用可能な AFC システムの国際規格</li> <li>✓ MRT2 号線、2a 号線、3 号線の AFC 資料</li> <li>✓ BRT、路線バスに関する計画資料</li> <li>✓ AFC 技術に関する法制度と決定文書（ハノイ市、MOT）</li> <li>✓ スマートカードと電気マネーに関する決定、規制、基準（中央銀行）</li> </ul>	
1-2：「設計ガイドラインと仕様」と運賃政策の方針案の作成	<ul style="list-style-type: none"> <li>- 下記の実施:</li> <li>✓ 相互利用乗車券仕様の検討</li> <li>✓ 相互利用運賃制度の検討</li> <li>✓ 運用制度の検討</li> <li>✓ 技術仕様の検討</li> </ul>	- 完了
1-3：関係機関との協議と「設計ガイドラインと仕様」と運賃政策の方針の確定	-	- 完了
1-4：「設計ガイドラインと仕様」と運賃政策の案の作成	-	- 完了
1-5：関係機関との協議と「設計ガイドラインと仕様」の確定	-	- 完了
1-6：「設計ガイドラインと仕様」と運賃政策の案に関するセミナーの実施	<ul style="list-style-type: none"> <li>- Seminar 1st : 5th December, 2018</li> <li>- Seminar 2<sup>nd</sup> 27<sup>th</sup> November, 2019</li> </ul>	- 完了



Seminar 1<sup>st</sup> の風景

Seminar 2<sup>nd</sup> の風景

出典: JICA プロジェクトチーム

図 2.2.1: セミナーの実施風景

### 2.2.1.2 成果 2: 運賃管理センター（部）の組織 TOR が策定される

成果 2 にかかる活動の結果を下表に記す。

表 2.2.2: 成果 2 の活動結果

活動・ワークアイテム No.	活動状況	結果
2-1: 運賃管理センター（部）の業務範囲の定義	- 法規法令に関する調査 - 運賃管理センター（部）が担うべき業務（機能）範囲の定義	- 完了 - 完了
2-2: 運賃管理センター（部）の各部署の職務内容と責任の定義	-	- 完了
2-3: 運賃管理センター（部）の各部署の職務内容と責任に関	-	- 完了

活動・ワークアイテム No.	活動状況	結果
する関係機関との協議		
2-4：運賃管理センター（部）の組織体制や採用要件を含む、各部署の詳細な職務内容と責任に係る組織 TOR の準備・提出	- 業務・運用の要件定義 - 組織構造および要員配置	- 完了 - 完了



## 2.2.2 プロジェクト目標と指標

### 2.2.2.1 成果 1

成果 1 の達成状況を下表に記す。

表 2.2.3: 評価指標とプロジェクト成果 (成果 1)

評価指標	ベースライン	プロジェクト終了時の状況
相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」が作成される	- なし	<ul style="list-style-type: none"> <li>- 相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」が作成され、DOT から HPC に提出された。</li> <li>- 相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」に関するセミナーが開催され、ハノイ市関係部局とのコンセンサスが得られた。</li> </ul>

出典: PDM 1.1

### 2.2.2.2 成果 2

成果 2 の達成状況を下表に記す。

表 2.2.4: 評価指標とプロジェクト成果 (成果 2)

評価指標	ベースライン	プロジェクト終了時の状況
運賃管理センター (部) の組織 TOR が作成・提出される	- なし	- 運賃管理センター (部) の組織 TOR が作成された

出典: PDM 1.1

### 2.2.2.3 プロジェクト目標の達成状況

PDM に記載のあるとおり、プロジェクト目標の達成状況は評価指標を用いながら判断される。

表 2.2.5: 評価指標と現況

評価指標	ベースライン	プロジェクト終了時の状況
- 「設計ガイドラインと仕様」が HPC に承認される	- なし	- HPC の承認手続きに諮る「設計ガイドラインと仕様」が策定された。
- 公共交通運賃政策の方針が作成される	- なし	- 公共交通運賃政策の方針が作成された。

出典: PDM 1.1

本プロジェクト各指標に対して要求される知識および技術は下表に示す通りである。知識・技術のレベルを下記に示す 5 段階に分け、点数で示した。

- (1) 初心者. その名称は聞いたことがない (1 点)
- (2) 入門者. その名称は聞いたことはあるが、中身の構成はよくわからない (2 点)
- (3) ヤングエキスパート. その構成はわかるが、詳細までは理解していない (3 点)
- (4) エキスパート. その内容を理解しており、第三者に説明できる。しかし、内容について新たな追加や変更は難しい (4 点)
- (5) シニアエキスパート. その内容を理解しており、第三者に説明できる。さらに、必要に応じて内容を修正できる (5 点)

表 2.2.6:成果・活動別の能力要素

成果	活動	要求される知識・技術
成果 1： 相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」が策定され	Working Group 1： 運賃制度の検討	1-1 共通乗車券規程書（鉄道） Specifications of interoperable fare ticket [Metro] 1-2 共通乗車券規程書（バス） Specifications of interoperable fare ticket [Bus] 1-3 運賃規程書（鉄道） Fare regulation [Metro] 1-4 運賃規程書（バス） Fare regulation [Bus]
	Working Group 2： 運用制度の検討	2-1 運用仕様書（鉄道） Operational Specifications [Metro] 2-2 運用仕様書（バス） Operational Specifications [Bus]
	Working Group 3： 技術仕様の検討	3-1 技術規程書 Technical Rules 3-2 実装技術仕様書 Implementing Technical Specifications 3-3 上位システム仕様 Host System
成果 2： 運賃管理センター（部）の組織 TOR が策定される	Working Group 4： 運賃管理センター検討	4-1 業務（機能）範囲定義書 Scope of Work of FMC 4-2 職務分掌規程書 Tasks and Responsibilities of FMC 4-3 業務運用要件定義書 Requirements on management and operation 4-4 要員配置要件定義書 Organizational Structure and Staff Requirements

成果	活動	要求される知識・技術
		4-5 運賃管理センター運用管理規程要件書 Operation management regulation of FMC

カウンターパートの現状の知識・技術を確認するため、2018年4月に第1回ベースライン調査を実施した。その後、プロジェクトの成果を確認するために、下記に示す時点でモニタリング調査を行った。（詳細は Part 3 3.1.2 有効性を参照）

- 2018年4月：プロジェクト開始当初
- 2018年12月：基本方針作成時点
- 2019年10月：DG/TS（1st-ドラフト）作成時点
- 2020年11月：DG/TS（2nd-ドラフト）作成時点

## 2.3 PDM および PO の変更

### 2.3.1 リスクの変化と軽減

1.3 プロジェクト実施期間に記載のとおり、ハノイ市から、将来のスマートシティ構想を踏まえ、今後の新しい技術への対応として ABT (Account Based Ticketing) 方式について検討してほしいという要望を受け、CBT-ABT の比較検討を実施した。

活動1の成果品である DG/TS における運賃支払いタイミングについて、当初設定していた後払い方式から先払い方式に変更した。世界的に流行している新型コロナウイルス感染症 (COVID-19) の影響により、2020年3月以降は日本とハノイでの遠隔でプロジェクト活動を進めた。

### 2.3.2 ハノイ市交通局 (HDOT) の対応

CBT-ABT の比較検討、DG/TS における運賃支払いタイミングの変更などの局面において、JICA/JET と協議を重ね、双方の合意形成を図り、プロジェクト活動の推進に努めた。

### 2.3.3 変更結果

1.3 プロジェクト実施期間に記載のとおり、本プロジェクト期間は1年5ヶ月延長された。

## 2.4 その他

### 2.4.1 社会環境配慮

該当なし。

### 2.4.2 ジェンダー・平和構築・貧困削減

該当なし

## Part 3. ジョイントレビュー結果

### 3.1 DAC 評価 5 項目についてのジョイントレビュー結果

本案件実施結果を、経済協力開発機構（OECD）開発援助委員会（DAC）による DAC 評価 5 項目<sup>1</sup>（妥当性、有効性、効率性、インパクト、持続性）（下表参照）を用い、プロジェクトチームとハノイ市交通局（HDOT）とで共同でレビューを実施した。「非常に高い」、「高い」、「一部課題がある」、「低い」の 4 段階で評価する。

表 3.1.1: JICA プロジェクト評価項目

評価項目	定義
1. 妥当性（現地ニーズ、政策との関連性）	「プロジェクト目標」「上位目標」は政府・実施機関・ターゲットグループの政策・ニーズと合致しているか
2. 有効性（プロジェクト目標の達成度）	「アウトプット」によって「プロジェクト目標」がどこまで達成されたか
3. 効率性	「投入」が「アウトプット」にどのようにどれだけ転換されたか。投入の質、量、手段、方法、時期は適切か
4. インパクト	プロジェクトが実施されたことにより生ずる直接的、間接的な正負の影響。計画当初に予想されなかった影響や効果も含む
5. 持続性	JICA の協力終了後もプロジェクト実施による（1）政策と制度（2）組織（3）財政（4）技術レベルの 4 点における効果が持続されるか

#### 3.1.1 妥当性

下記に述べる理由により、妥当性は「非常に高い」と判断した。

ベトナム政府は下記に示すとおり、公共交通機関を優先的に整備し、公共交通分担率の向上を図る政策を掲げている。

- 「ハノイ市の交通渋滞と環境汚染を緩和するための車両管理の強化（2017 年から 2020 年の期間および 2030 年までのビジョン）」（Resolution No. 04/2017/NQ-NDND (dated 4th July 2017)：公共交通分担率の向上を図る（市内中心部（2020 年：30-35% ⇒ 2030 年：50-55%）、衛星都市部（2020 年：15% ⇒ 2030 年：40%））。

<sup>1</sup> DAC Criteria for Evaluating Development Assistance :

<http://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm>

- 「公共交通機関の優先的整備」（Resolution No. 07/2019/NQ-HDND (dated 10th July 2019)）：バス停及び駐車場の投資、建設、運営の奨励。輸送システムの管理と運用における先進技術の適用。

現在、ハノイ市では、日本が支援する都市鉄道 1・2 号線の計画があるほか、中国が支援する 2a 号線、フランス及びアジア開発銀行が支援する 3 号線が建設中である。支援ドナーにより異なる IC カードタイプが導入される予定であり、このままでは各都市鉄道路線及びその他の公共交通機関の相互利用が阻害され、公共交通の整備効果が十分に発揮されない可能性がある。こうした状況において、1 枚の IC カードで鉄道とバスの各路線の乗り降りを可能とする「IC カード相互利用の技術仕様」を作る本プロジェクトは、ハノイ市における公共交通の利用促進に寄与し、現地のニーズ・政策に合致している。

また、ハノイ市では、ハノイ市人民委員会の指導のもとでスマートシティ政策が進められており、その一環として公共交通へのスマートカード（IC カード）の導入が喫緊の課題とされている。本プロジェクトは、ハノイ市のスマートカード導入に当たり、その基礎になるものと期待されている。

### 3.1.2 有効性（プロジェクト目標の達成度）

本プロジェクトの目標は、相互利用可能な IC カードシステムの構築に向け、ハノイ市人民委員会のもとにある実施機関の技術及び運営管理能力が向上することである。本プロジェクトの有効性は、以下に述べる理由により「非常に高い」と評価する。

アウトプット 1 の「相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」（以下、DG/TS と称す）の策定」およびアウトプット 2 の「運賃管理センター（部）の組織 TOR の策定」に関するカウンターパートの知識・技能について、下表に示すとおり 5 段階評価によるベースライン調査及びモニタリング調査を実施し、いずれのアウトプットも数値が上昇していることを確認した。

アウトプット 1 は、「相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」の策定」という、技術的に難しい内容であったため、2.49 とベースライン調査時で中間値である 3 を下回る状況であったが、それが 4.01 まで上昇した。内訳を見ると、「運賃」に関する指標である共通乗車券規程書や運賃規定書は、プロジェクト開始時の 1.7 からプロジェクト終了時は 3.8 まで上昇した。「運用」に関する指標は、プロジェクト開始時の 3.3 からプロジェクト終了時は 4.2 まで上昇、「技術仕様」に関する指標は、プロジェクト開始時の 3.0 からプロジェクト終了時は 4.1 まで上昇した。

アウトプット 2 については、業務（機能）範囲定義書、職務分掌規程書、業務運用要件定義書などの理解度について、プロジェクト開始時の 3.33 からプロジェクト終了時は 4.67 まで上昇した。

このようにカウンターパートの知識・技能が向上した要因として、後述するワーキンググループでの技術移転のほか、2 度にわたる本邦研修（2018 年 5 月、2020 年 2 月）による視察や講義を経て習得された知識が活かされたこと、ハノイで 2 度開催したセミナー（2018 年 12 月、2019 年 11 月）に主体的に関わったことが挙げられる。

表 3.1.2: 各アウトプットに対する平均点

期間	アウトプット 1：相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」の策定	アウトプット 2：運賃管理センター（部）の組織 TOR の策定
プロジェクト開始時 (2018 年 4 月)	2.49	3.33
基本方針策定 (2018 年 12 月)	3.03	3.67
DG/TS (案) / FMC・TOR レポート (案) 作成 (2019 年 10 月)	3.56	4.00
プロジェクト終了時 (2020 年 11 月)	4.01	4.67

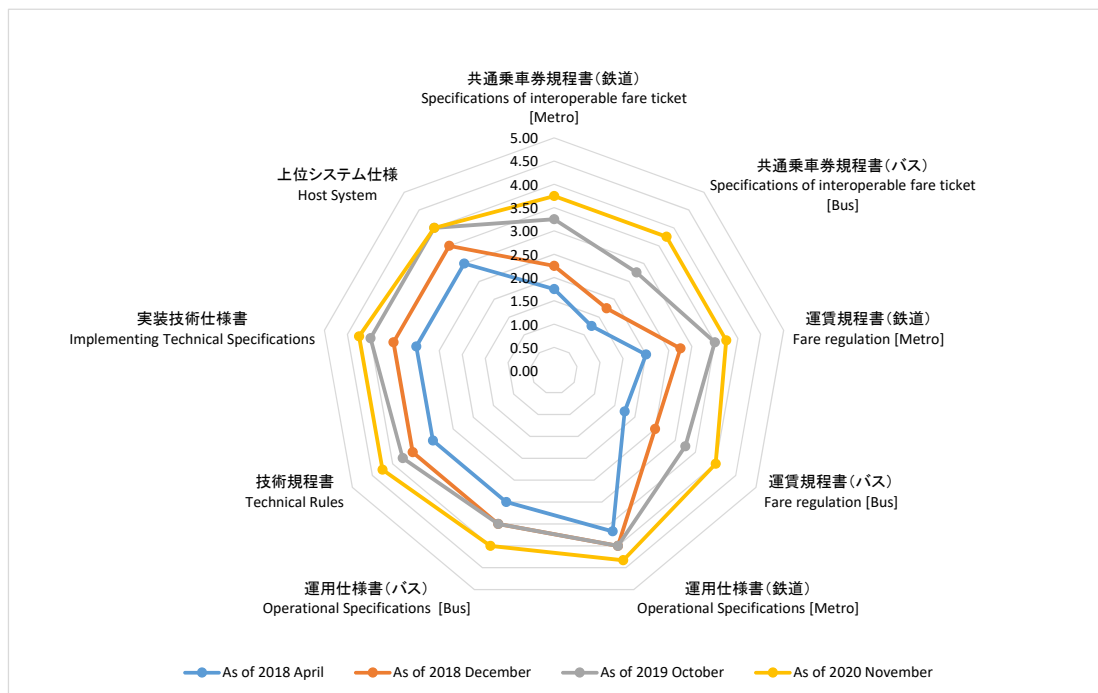


図 3.1.1: アウトプット 1：相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」の策定に必要な知識・技能

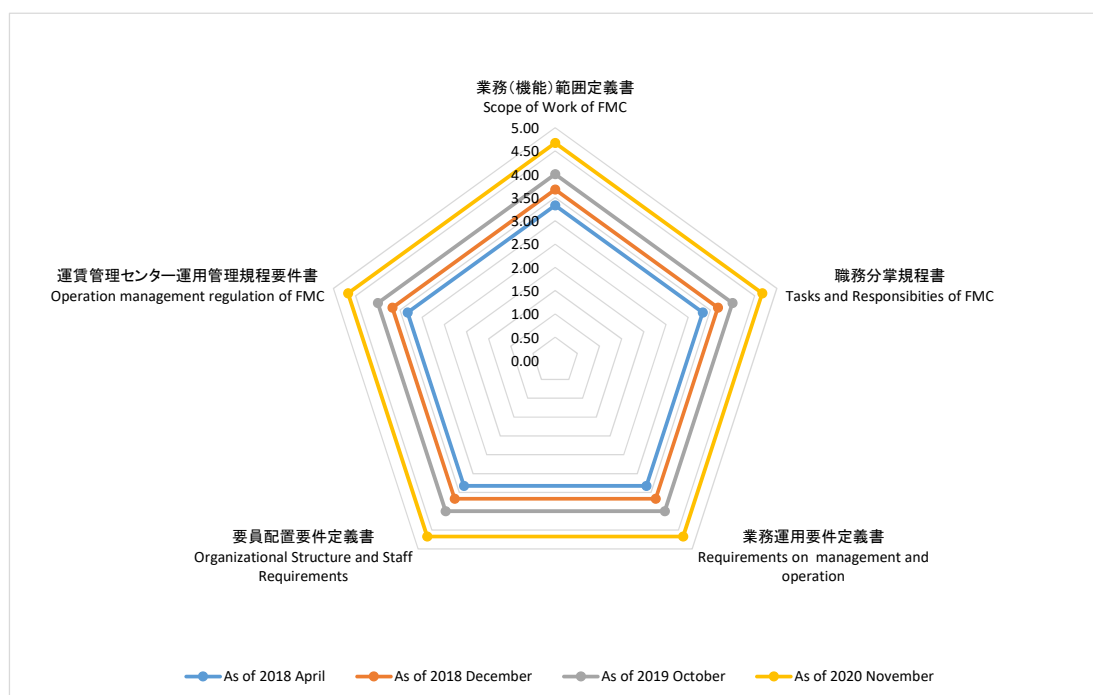


図 3.1.2: アウトプット 2 : 運賃管理センター（部）の組織 TOR の策定に必要な知識・技能

### 3.1.3 効率性

Part2 の「2.1 プロジェクトの結果」に記載のとおり、日本側およびベトナム側双方からのインプットは当初予定通り完了し、プロジェクト目標を達成した。また、日本側からの機材供与状況については、Part2 「2.1.1.2 投入機材」の項目に示すとおりである。

本プロジェクトには延べ 29 名がカウンターパートとしてアサインされた。Part1 「1.7.3 ワーキンググループの設置」に記載のとおり、本プロジェクトのアウトプットの活用においては、システム設計の具体的な内容を検査する組織や技術仕様を運用管理する組織など、各組織によって修得すべき知識が異なるため、ワーキンググループを設定して効率的かつ効果的に技術移転を図った。プロジェクト期間中に合計 189 回のワーキンググループ会議を実施し、各ワーキングのテーマに沿って具体・詳細な検討を行い、カウンターパートの理解を高めながらプロジェクトを進行した。また、計画策定段階で開催した 2 回のセミナーで、関係部局のコンセンサスを得るよう努めた。このように、全般的に HDOT が主体となって活動を進めた。

一方、2020 年 2 月以降、COVID-19 の影響により日本人専門家が現地で活動できなかった。日本とベトナムの遠隔での技術移転という難しい局面において、オンライン会議でのコミュニケーションを通じてプロジェクトの品質を確保したことから、プロジェクトの効率性は「高い」と評価する。

各アウトプットに対する達成度は、以下の通りである。

- **成果 1**：計画通り、相互利用可能な IC カードシステムに必要な DG/TS が策定された。現在、DG/TS の承認に向け、DOT は人民委員会に継続して働きかけを行っているところである。

- **成果 2**：計画通り、運賃管理センター（部）の組織 TOR が策定された。今後は、本アウトプットに基づき、共通 IC カードの導入・運用を担う組織体制が整備される予定である。

### 3.1.4 インパクト

本プロジェクトの上位目標である「相互利用可能な IC カードがハノイ市のすべての公共交通で利用される」ために必要な DG/TS が策定されるとともに、AFC システムの運営管理を担う運賃管理センターの組織 TOR も策定された。このように、プロジェクトの上位目標達成のために必要な基本的な技術制度および組織体制のあり方が策定された。また、2020 年、新型コロナウイルスによるパンデミックが発生し、その感染拡大や収束に向けて 3 密（密集、密接、密閉）を回避するなどの対策が世界的に取られている。現金の受け渡しには感染の危険性が内在しており、キャッシュレス化すると「硬貨・紙幣使用の公衆衛生上の問題が低減する」と言われている。このような状況において IC カードの利用を促進する本プロジェクトのインパクトは大きいと考えられる。

本プロジェクトの成果を活かし、ハノイ市において AFC システム導入に向けた取り組みが期待されることであり、プロジェクトのインパクトを「高い」と判断する。

### 3.1.5 持続性

持続性については、プロジェクト終了時には評価しないことになっているが、カウンターパートと JICA プロジェクトチームの現時点での見解を以下にまとめた。

#### 3.1.5.1 政策と制度面

本プロジェクトの RECORD OF DISCUSSIONS では、DG/TS をハノイ市の公共交通全てに採用することが記載されている。また、2015 年 8 月に発行された HPC 決定 No. 3978/QĐ-UBND にて、ハノイ市交通局の下で複数の交通モードで相互利用可能な IC カードシステムの運営管理を行う組織（運賃管理センター）の設立について記載されている。

2019 年 8 月 29 日に実施した第 4 回 JCC において、ハノイ市交通局は、本プロジェクトの成果が下記 3 つに適用されることをハノイ市人民委員会に報告することについて言及した。

- 1) 都市鉄道（建設中または計画の各路線）
- 2) BRT および路線バス
- 3) 運賃管理センター（Fare Management Center：FMC）

こうしたことから、本プロジェクト目標である「相互利用可能な IC カードシステムの構築に向け、ハノイ市人民委員会のもとにある実施機関の技術及び運営管理能力が向上すること」は、ハノイ市人民委員会、ハノイ市交通局及び関連機関によって継続的に検討されていくものと期待される。

#### 3.1.5.2 組織的側面

本プロジェクトでは、ハノイ市における公共交通で利用可能な IC カードを発行・管理する運賃管理センターの設立に向けて、当該運賃管理センターに求められる一般的な機能モデル及び業



務運用要件を定義した。これらは、運賃管理センターとして一般に求められる機能についてハノイ市の状況に基づき整理したものであり、特定の既存組織を想定したものではない。今後は、運賃管理センターの設立とともに、ハノイ市における AFC システムの導入および運用のための組織体制について具体的な検討が必要である。

### 3.1.5.3 財務面

「3.1.1 妥当性」で既述のとおり、「公共交通機関の優先的整備に関する規定（No. 07/2019/NQ-HDND、dated 10th July 2019）において、都市鉄道・BRT・路線バスの建設に関するハノイ市の予算補助について記載がある。しかし、これらは建設に対する補助であり、AFC に対する補助ではない。本プロジェクトの成果を活用し、将来にわたりプロジェクトの財政的持続可能性が担保されるためには、AFC システム構築と運用に係る費用の確保が今後の重要な課題である。

### 3.1.5.4 技術的側面

第4回 JCC において、ハノイ市の IT 企業がプロジェクト活動に参加することが承認され、以降の活動においては、ハノイ市の IT 技術に関する現状を理解したメンバーが DG/TS の作成に加わり、ハノイ市の現状を踏まえた DG/TS が作成された。本プロジェクトにおいて IT 企業と連携したことは、将来ハノイ市において DG/TS を活用して AFC システムを導入する際の技術的側面において効果的と考える。

また、カウンターパートの技術的能力に関しては、アウトプット 1：相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」の策定、アウトプット 2：運賃管理センター（部）の組織 TOR の策定とともに、上述の通り改善されていることを確認した。プロジェクト終了後も、カウンターパートはプロジェクトで学んだ知識、スキルを継続的に活用して、AFC システムの導入に努めることが期待される。

## 3.2 プロジェクトの実施・成果に影響を与えた主な要因

以下の要因がプロジェクト実施に影響を与えた。

- (1) **カウンターパートの配置の遅れ**：第1回 JCC（2018年2月2日）において、ワーキンググループのメンバーは2018年2月に配置されることが合意されていた。しかし、最終的にワーキンググループのメンバーが決まったのは2018年3月29日であった（Decision No. 341/QD-SGTVT dated 29 March 2018）。
- (2) **CBT と ABT の比較検討を実施したことによる遅れ**：Decision 3978/QD-UBND に基づき、カードベース（CBT）方式を前提とする DG/TS 基本方針が、2019年1月17日にプロジェクトチームから HDOT に提出され、基本方針の承認手続きに入った。カードベース方式は、本プロジェクトの前提条件であったが、ハノイ市は、将来のスマートシティ構想を見据え、アカウントベース（ABT）方式への対応について検討することを JICA に提案した。そのため、CBT 方式と ABT 方式の比較検討を実施し、最終的に CBT 方式とすることが決まり、DG/TS 基本方針が承認されたのは、提出から約3か月後の2019年4月26日であった。

- (3) **新型コロナウイルス感染症 (COVID-19)** :世界的に流行している新型コロナウイルス感染症 (COVID-19) の影響により、日本人専門家が現地で活動できないなど、プロジェクト実施に大きな影響を及ぼした。

### 3.3 プロジェクトのリスクマネジメントに対する結果評価

上記の要因に対し、DOT は以下の様に対応を行った。

- (1) **カウンターパートの配置の遅れ** :プロジェクト開始時のワーキンググループ・メンバーの配置は遅れたものの、プロジェクト期間中は、約 190 回のワーキンググループ会議を実施するなど精力的に活動を遂行した。また、第 4 回 JCC (2019 年 8 月 29 日) において、ハノイ市の IT 企業がプロジェクト活動に参加することが承認され、ハノイ市の IT 技術に精通したメンバーがワーキンググループに参加し、ハノイ市の現状を踏まえた DG/TS が作成された。DOT 局長と副局長及び公共交通サービスセンター (TRAMOC) 所長が積極的にプロジェクト活動に参加し、JICA プロジェクトチームと緊密なコミュニケーションを図った。
- (2) **CBT と ABT の比較検討を実施したことによる遅れ** :2019 年 4 月 19 日、ハノイ市人民委員会・委員長主催の検討会を実施した。この会議の結果、提出済みの DG/TS 基本方針に沿ってプロジェクトを進めることが決定した。2019 年 4 月 26 日、DG/TS 基本方針が承認された (HPC レターNo.: 1648/UBND-DT) 。
- (3) **新型コロナウイルス感染症 (COVID-19)** :2020 年 2 月以降、COVID-19 の影響により日本人専門家が現地で活動できなかったため、オンライン会議でのコミュニケーションを通じてプロジェクトの品質を確保した。オンライン会議は、ワーキンググループ会議だけでなく、DOT や TRAMOC の幹部、JICA 本部、JICA ベトナム事務所も交えて、複数回のオンライン会議を実施した。また、2020 年 12 月 18 日にプロジェクトチームリーダー (高木総括) がハノイ入りし、直接ハノイ市側と協議・調整を図ることにより、本プロジェクト開発効果を高めた。

### 3.4 プロジェクトから得られた知見

本プロジェクトの実施から、以下の知見が得られた。

- 日本の IC カードの仕組み :2 回実施した本邦研修を通じて、C/P は、日本の各モード間での IC カード相互利用の実態や地域特性に合わせた運用状況等に関する知見を深めた。特に、IC カードの導入・運用に関するコスト (初期コスト、メンテナンスコスト、補助金など)、事業実施体制 (各組織の機能、スタッフの役割・人数、本プロジェクトで検討している運賃管理センターに相当する組織の役割など)、IC カードから得られる利用データの種類と分析・活用方法を学んだ。
- 汎用性の高い技術仕様 :本プロジェクトで策定する技術仕様は、様々な運賃計算方法 (距離別運賃、均一運賃、ゾーン別運賃など) に対応できる。また、乗車時と降車時の 2 回 IC カードをタッチする (2 タップ) 運用を基本としているが、技術仕様上は 1 タップ運用でも可能な仕様構成となっている。このような運賃や運用に関する規定は、各ワーキンググル

ープで協議した結果の積み重ねであり、ハノイ市公共交通の利用状況を踏まえた、汎用性の高い技術仕様となっている。

- スマートシティ・ハノイの更なる発展に向けた AFC の可能性：本プロジェクトはカードベース（CBT）方式を前提としているが、ハノイ市の発展（市民の銀行口座等金融手段利用増加やインバウンドの増加）にともない、将来的には ABT（Account Based Ticketing）や新たな Fintech への対応が必要になると考えられる。そこで本プロジェクトでは、1：CBT 方式、2：カードベース+シンクラ方式、3：ABT 方式について、機能面・運用面・セキュリティ面・経済面等から比較検討し、スマートシティ・ハノイの更なる発展に向けた AFC の基本方針について提案した。IC カードを含む ICT の分野は技術革新のスピードが速い。技術協力プロジェクトの実施効果を高めるためには、プロジェクト期間中においても技術革新の動向を注視し、それらに柔軟に対応することも重要だと考える。
- 本プロジェクト後の技術協力の検討：本プロジェクトの成果として、相互利用可能な IC カードシステムに必要な「設計ガイドラインと仕様」が策定された。また、運賃管理センター（部）の組織 TOR が策定された。これら技術協力プロジェクトの成果を活用し、ハノイ市において相互利用可能な IC カードシステムを導入・運用するためには、導入・運用フェーズに合った技術的支援が求められるだろう。そのための技術協力のあり方についての検討が必要である。

## Part 4. 上位目標達成に向けた提言

### 4.1 上位目標達成の見込み

本プロジェクトの上位目標は、「相互利用可能な IC カードがハノイ市のすべての公共交通で利用される」ことであり、その指標は「本プロジェクトで作成する「設計ガイドラインと仕様」が適用される公共交通事業者数」および「相互利用可能な IC カードの満足度」となっている。

本プロジェクトのカウンターパートは、HDOT（ハノイ市交通局）や DOIC（ハノイ市情報通信局）、TRAMOC（都市交通管理サービスセンター）といった行政機関と、TRANSERCO（ハノイ運輸総公社）や HMC（ハノイ・メトロ・カンパニー）といったバス事業者／鉄道事業者で構成されている。本プロジェクトでは、ワーキンググループ会議を通じて「設計ガイドラインと仕様」を日本人専門家と共に作成しており、C/P は、仕様書の技術的な内容を熟知している。また、第 2 回本邦研修（2020 年 2 月）は、行政から 3 名（HDOT、DOIC、TRAMOC）と、交通事業者から 2 名（HMC、TRANSERCO）というバランスの良いメンバー構成で実施された。この 5 名は、ワーキンググループのリーダーを務めるなど、本プロジェクトに積極的に参加しており、将来のハノイ市における AFC システムの運用において重要な役割を果たすことが期待されるメンバーである。

このように、将来ハノイ市における AFC システムの導入・運営を担っていく行政機関および公共交通事業者への技術移転が確実に実施されたことから、上位目標達成の見込みは高いと考えられる。

### 4.2 ベトナム側の上位目標達成に向けた取り組み

ハノイ市では、都市鉄道への AFC の導入が進められており、日本が支援する 1 号線や 2 号線は FeliCa カードを使ったシステム、中国が支援する 2a 号線は MIFARE、フランスと ADB が支援する 3 号線は Calypso のカードが予定されている。こうしたなかでハノイ市としては、相互利用できるシステムを開発するための技術基準を策定することを目的として本プロジェクトの要請がなされた。その後、2019 年 8 月 29 日に実施した第 4 回 JCC において、ハノイ市交通局は、本プロジェクトの成果が下記 3 つに適用されることをハノイ市人民委員会に報告するとした。

- 1) 都市鉄道（建設中または計画の各路線）
- 2) BRT および路線バス
- 3) 運賃管理センター（Fare Management Center：FMC）

2021 年 3 月時点では上記に関する具体的な取り組みには至っておらず、AFC システム導入に向けた今後の取り組みが期待される場所である。

### 4.3 ベトナム側への提言

本プロジェクトの成果がハノイ市の公共交通に導入され、安全で利便性の高い IC カード相互利用サービスを実現するためには、本プロジェクト終了後、下記についてハノイ市で取り組むことを提案する。

#### (1) バスへの AFC システム導入

ハノイ市における都市鉄道の開業が遅れていることから、本プロジェクトの成果を最初に導入する可能性が高いのはバスである。まずはバスへの AFC システム導入に向けて、運用計画（AFC を導入するバス路線、設備機器の規模、オペレーション体制など）、AFC システム構成、AFC 導入に係る概算コスト、工程計画を立てる。また、調達する AFC 設備機器が本プロジェクトの成果物に基づく規程や仕様と合致していることを検証する。

#### (2) 運賃管理センター（FMC）の設立

交通 IC カードの運営のみでは事業収益性が低いことが想定される。ハノイ市において AFC 事業を継続するためには、PPP スキームによる民間投資を前提とした実施運営組織（SPC）を構築し、この SPC が AFC システムを運営管理するための運賃管理センター（FMC）の機能を担う事業スキームを提案する。SPC は、ハノイ市、ハノイ市の公共交通事業者（TRANSERCO や HMC など）、民間企業から構成され、下記の役割を担うものとする。

- 共通 IC カードの運用と管理（共通カードの発行、運用管理、精算（クリアリング））
- AFC 機器の運用・保守管理
- 公共交通関連データベースの管理
- 公共交通利用促進（利用促進のための新たな商品開発、各種利用促進策の実施）

### 4.4 プロジェクト終了時から事後評価までのモニタリング計画

JICA は国際基準（DAC 評価指標）に基づいて、それぞれのプロジェクトについて妥当性、有効性、効率性、インパクト、持続性を評価している。これらの評価結果については、本報告書の Part3 に記載されており、事後評価で再び評価されることになる。一般的に、事後評価はプロジェクトが終了した 2 年後に実施される。

本プロジェクトにおいても事後評価が実施される。JICA は、事後評価が始まるまでの間、以下に挙げるプロジェクトの成果についてモニタリングを行う。

- ・ バスの AFC システム導入に向けた進捗
- ・ 運賃管理センター（FMC）の設立

ハノイ市の発展（市民の銀行口座等金融手段利用増加やインバウンドの増加）にともない、ABT（Account Based Ticketing）や新たな Fintech（ファイナンス・テクノロジー）への対応が必要になると考えられる。IC カードを含む ICT の分野は技術革新のスピードが速いため、こうした技術革新についても注視する必要がある。

# **Appendix**

## **Project Monitoring Sheet**

## PROJECT MONITORING SHEET

**Project Title:** The Project for Supporting Development of Interoperable Smart Card System for Public Transport in Hanoi

**Version of the Sheet:** Ver. 1 (Term: 2017 - 2019)

**Name:** Mr. Michimasa TAKAGI

**Title:** Team Leader/ Urban Public Transport

**Submission Date:** February 2018

### I. Summary

#### 1 Progress

##### 1.1 Progress of Inputs

##### 1.1.1 Experts

**Table 1: Input of Experts as of \*\*\***

Designation	Name	No. of PMs
Team Leader/ Urban Public Transport	M. TAKAGI	
Deputy Team Leader/ AFC Technical Management	T. OTSUKI	
Public Transport Fare Policy [Railway]	S. HORIUCHI	
Public Transport Fare Policy [Bus]	T. KUMAI	
Interoperable Smart Card Plan	T. UMEKAWA	
Smart Card Data Management and Utilization	N. MIZOGUCHI	
Interoperable Smart Card System [Railway]	T. FUKATSU	
Interoperable Smart Card System [Bus]	A. TANAKA	
Communication System	K. HONDA	
Fare Management System [AFC Technical Specification]	H. KUWANO	
Fare Management system [AFC Host System]	Y. Sakamoto	
Organization Institution	A. SAKUMA	
Monitoring/ Training in Japan/ Coordination	M. OHNO	
TOTAL PMs		
Planned PMs		<b>55.00</b>

## 1.2 Progress of Activities

### 1.2.1 Joint Coordinating Committee and Working Group Meetings

XX Joint Coordinating Committee (JCC) meetings and several working group (WG) meetings were held during the period.

**Table 2: Joint Coordinating Committee and Working Group Meetings**

Meetings Conducted	Participated Agency	Key Agenda	Date

### 1.2.2 Output 1: 'Design Guideline and Specifications' for interoperable smart card system are developed.

The progress of Output 1 activities is shown in the table below.

**Table 3: Progress of Output 1 Activities**

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system including MRT, BRT and Bus in Hanoi			
1-2 Prepare an outline of 'Design Guideline and Specifications' and the fare policy	1) Examination of ticket specifications for interoperable use 2) Examination of fare system rules for interoperable use 3) Examination of the operational specifications 4) Examination of the technical specifications		
1-3 Consult with the relevant authorities and finalize the concepts of the 'Design Guideline and Specifications' and the fare policy.			
1-4 Preparation of the drafts of the 'Design Guideline and Specifications' and the fare policy			
1-5 Consult with the relevant authorities and finalize the 'Design			



Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
Guideline and Specifications' and the fare policy			
1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.			

**1.2.3 Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.**

The progress of Output 2 activities is shown in the table below.

**Table 4: Progress of Output 2 Activities**

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	1) Conduct a survey of relevant laws and regulations 2) Define the scope of work of the Fare Management Center (division)		
2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).			
2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division).			
2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.	1) Prepare a TOR 2) Organizational structure and staff requirements		

**1.3 Achievement of Output**

**1.3.1 Output 1**

Achievement status of Output 1 is as follows.

**Table 5: Verifiable Indicators and Current Status**

Objectively Verifiable Indicator	Baseline	Current Status
The Design Guideline and Specification is prepared.		

Source: PDM 1.1

**1.3.2 Output 2**

Achievement status of Output 2 is as follows.

**Table 6: Verifiable Indicators and Current Status**

Objectively Verifiable Indicator	Baseline	Current Status
Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval	-	-

Source: PDM 1.1

**1.4 Achievement of the Project Purpose**

Also stated in PDM, the achievement of the project purpose shall be evaluated using verifiable indicators.

**Table 7: Verifiable Indicators and Current Status**

Objectively verifiable indicators	Baseline	Current Status
- 'Design Guideline and Specifications' are approved by HPC Bus system improvement plan	-	-
- The public transport fare policy is established	-	-

Source: PDM 1.1

To achieve the project purpose, the JICA Project Team (JPT) identify the required knowledge and skills by each output shown in the following table. Result of the baseline survey were evaluated on a five-level scale as indicated below and illustrated in following figures.

- (1) Newbie: I don't know the process/ concept;
- (2) Novice: I know the process/ concept, but I have never done it;
- (3) Young Expert: I have done it once, but I have not reported or presented the results;
- (4) Expert: I have done it twice or more/ I have done it once and reported or presented the results; and
- (5) Senior Expert: I have done it twice or more, and reported or presented the results.

**Table 8 Required Knowledge and Skills per Project Output and Activity**

Expected Output	Activities	Required Knowledge & Skills
(1) The 'Design Guideline and Specification' is prepared.	1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system including MRT, BRT and Bus in Hanoi	Information collection capability, Issue solving capability
	1-2 Prepare of outline of 'Design Guideline and Specifications' and the fare policy	(1) Basic knowledge of a) Ticket specifications, b) Fare system c) Operation system d) Technical specification e) Host system  (2) Capability for development of a) Rules for common ticket b) Rules for fare c) Rules for operation specification d) Rules for technology implementing specification e) Host system specification
	1-3 Consult with the relevant authorities and finalize the concepts of the 'Design Guideline and Specifications' and the fare policy.	
	1-4 Preparation of the drafts of the 'Design Guideline and Specifications' and the fare policy	
	1-5 Consult with the relevant authorities and finalize the 'Design Guideline and Specifications' and the fare policy	
	1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.	
(2) Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval	2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	(1) Information collection capability (2) Issue solving capability
	2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).	(1) Basic knowledge of the scope of works (functions) (2) Capability for development of the scope of work(function)
	2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division).	(1) Basic knowledge of work description (2) Capability for development of work description
	2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.	(1) Basic knowledge of a) Operational terms of reference b) Terms of reference for staffing (2) Capability for development of rules for operation and management of Fare Management Center

The first baseline survey was conducted in xxx 2018 to measure the current knowledge and skills level. The average scores are shown in the following table and each scores are in the following figures.

**Table 9 Average Scores per Outputs**

Survey	Output	
	1	2
Baseline Survey (xxx 2018)		

**Figure 1 Required Knowledge and Skills for Output 1: The Design Guideline and Specification is prepared.**

**Figure 2 Required Knowledge and Skills for Output 2: Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval**

**1.5 Changes of Risks and Actions for Mitigation**

**1.6 Progress of Actions undertaken by JICA**

**1.7 Progress of Actions undertaken by The People’s Committee of Hanoi**

**1.8 Progress of Environmental and Social Considerations (if applicable)**

**1.9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)**

**1.10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)**

**1.11 Tasks to be implemented by JICA Project Team and Counterparts**

Work	Tasks	Implementing agencies
Output 1: 'Design Guideline and Specifications' are approved by HPC Bus system improvement plan		
Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.		

**2 Delay of Work Schedule and/or Problems (if any)**

**2.1 Detail**

**2.2 Cause**

**2.3 Action to be taken**

**2.4 Roles of Responsible Persons/Organization (JICA, The People's Committee of Hanoi, etc.)**

**3 Modification of the Project Implementation Plan**

**3.1 PO**

**3.2 Other modifications on detailed implementation plan**

**II. Project Monitoring Sheet I & II** *as Attached*

**Project Monitoring Sheet I (Project Design Matrix)**

Version 1

Project title: Project for Supporting Development of Interoperable Smart Card System for Public Transportation in Hanoi

Dated: \*\*\* Feb. 2018

Project Area: Hanoi

Target Group: Hanoi People's Committee (HPC) and organizations related to public transportation in Hanoi

Counterpart: HPC (Hanoi Department of Transport (DOT), Hanoi Department of Science and Technology (DOST), Hanoi Department of Information and Communication (DOIC), Hanoi Metro Company (HMC), Hanoi Transport Corporation (TRANSERCO))

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption	Achievement	Remarks
<b>Overall Goal</b>					
Interoperable smart card systems are developed for the public transportation in Hanoi	<ul style="list-style-type: none"> <li>Number of public transport operators applying the 'Design Guideline and Specifications' developed under the Project to realize interoperable smart card system.</li> <li>Ratio of satisfaction on interoperable smart card is more than XX%.</li> </ul>	Survey report(s)			
<b>Project Purpose</b>					
Technical and management capacities of counterpart agencies under HPC are improved for the development of interoperable smart card system for public transportation in Hanoi	<ul style="list-style-type: none"> <li>'Design Guideline and Specifications' are approved by HPC.</li> <li>The public transport fare policy is established.</li> </ul>	<ul style="list-style-type: none"> <li>Approved 'Design Guideline and Specifications'</li> <li>Project progress report</li> </ul>	Decision no. 3978/QD-UBND dated 13 August 2015 on use of interoperable smart card in public transportation in Hanoi continues to be effective.		
<b>Outputs</b>					
1. 'Design Guideline and Specifications' for interoperable smart card system are developed.	'Design Guideline and Specifications' are finalized.	'Design Guideline and Specifications' (final version)	HPC reviews policy/ documents developed under the Project in a timely manner.		
2. Organization terms of reference of each unit of the Fare Management Center (Division) are developed.	Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval.	Organizational terms of reference for the Fare Management Center (Division) (draft for approval)			

Activities	Input		Pre-conditions
	Japanese Side	Vietnamese Side	
1-1. Collect and analyze information on the existing and approved smart card systems for the public transportation system in Hanoi	1. Japanese Experts - Leader - Public Transport Fare Policy and System - Interoperable Smart Card System - Communication System - Fare Management System	1. Project Counterparts (1) HPC (2) HDOT - Road Transportation Management Division - Planning and Investment Division - Economics planning Division - TRAMOC (3) DOST (4) DOIC (5) HMC (6) TRANSERCO 2. Provision of Office Space and equipment 3. Cost for - counterpart members - office operation and maintenance - others (local travel expenses excluding airfare for Vietnamese side, etc.)	Official request to apply for Japan's ODA Loan Project.
1-2. Prepare an outline of 'Design Guideline and Specifications' and fare policy	2. Counterpart Training in Japan		
1) Examination of fare ticket specifications for interoperable use 2) Examination of fare system rules for interoperable use 3) Examination of the operation rules 4) Examination of the technical specifications	3. Seminar and workshop		
1-3. Consult with the relevant authorities and finalize the outline of the 'Design Guideline and Specifications' and fare policy	4. Other cost - Local experts and consultants - Local staff - Others (survey, card rental, etc.)		
1-4. Draft a 'Design Guideline and Specifications' with fare policy			
1-5. Consult with the relevant authorities and finalize the 'Design Guideline and Specifications'			
1-6. Conduct seminar(s) to introduce the draft 'Design Guideline Specifications' and fare policy			
2-1. Define the scope of work to be performed by the proposed Fare Management Center (Division)			
1) Conduct a survey of relevant laws and regulations 2) Define the scope of work of the fare management center (division)			
2-2. Define the tasks and responsibilities of departments/division under the Fare Management Center (Division)			
2-3. Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division)			
2-4. Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.			
1) Prepare a TOR 2) Organizational structure and staff requirements			



## PROJECT MONITORING SHEET

**Project Title:** The Project for Supporting Development of Interoperable Smart Card System for Public Transport in Hanoi

**Version of the Sheet:** Ver. 2 (Term: 2017 - 2019)

**Name:** Mr. Michimasa TAKAGI

**Title:** Team Leader/ Urban Public Transport

**Submission Date:** August 2018

### I. Summary

#### 1 Progress

This monitoring sheet covers the period from project commencement in **December 2017** up to **the end of July 2018**.

#### 1.1 Progress of Inputs

##### 1.1.1 Experts

**Table 1: Input of Experts as of End-July**

Designation	Name	No. of PMs
Team Leader/ Urban Public Transport	M. TAKAGI	<b>3.47</b>
Deputy Team Leader/ AFC Technical Management	T. OTSUKI	<b>2.85</b>
Public Transport Fare Policy [Railway]	S. HORIUCHI	<b>1.35</b>
Public Transport Fare Policy [Bus]	T. KUMAI	<b>1.02</b>
Interoperable Smart Card Plan	T. UMEKAWA	<b>0.13</b>
Smart Card Data Management and Utilization	N. MIZOGUCHI	<b>0.00</b>
Interoperable Smart Card System [Railway]	T. FUKATSU	<b>1.42</b>
Interoperable Smart Card System [Bus]1	A. TANAKA	<b>1.27</b>
Interoperable Smart Card System [Bus]2	H. Miyahara	<b>0.20</b>
Communication System	K. HONDA	<b>0.40</b>
Fare Management System [AFC Technical Specification]	Y. WATABE	<b>0.57</b>
Fare Management system [AFC Host System]	Y. Sakamoto	<b>0.50</b>
Organization Institution	A. SAKUMA	<b>0.60</b>



Monitoring/ Training in Japan/ Coordination	M. OHNO	<b>1.33</b>
TOTAL PMs		<b>17.84 (32.4%)</b>
Planned PMs		<b>55.00</b>

## 1.2 Progress of Activities

### 1.2.1 Joint Coordinating Committee and Working Group Meetings

One Joint Coordinating Committee (JCC) meeting and several working group (WG) meetings were held during the period.

**Table 2: Joint Coordinating Committee and Working Group Meetings**

Meetings Conducted	Participated Agency	Key Agenda	Date
First JCC meeting	HDO, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	Outline of Work Plan (Draft) Confirmation of the Undertakings by Vietnamese Side	2 February 2018

**Table 3: Working Group 1 Meetings**

No.	Date	Subject
1	16th Apr, 2018	<ul style="list-style-type: none"> <li>Outline of the expected output of WG1</li> <li>Confirmation of the activity schedule</li> </ul>
2	29rd May, 2018	<ul style="list-style-type: none"> <li>Explanation of the Fare Management System in Japan</li> </ul>
3	30th May, 2018	<ul style="list-style-type: none"> <li>Discussion on the feasibility to install each system into Hanoi</li> </ul>
4	5th June, 2018	<ul style="list-style-type: none"> <li>Explanation of the Fare Management System in the other countries</li> </ul>
5	25th July, 2018	<ul style="list-style-type: none"> <li>Clarification of the items to be discussed</li> <li>Discussion on the reporting to the 2nd JCC</li> </ul>

**Table 4: Working Group 2 Meetings**

No.	Date	Subject
1	12th Apr, 2018	<ul style="list-style-type: none"> <li>Procedure on WG2 activities "Development of Operational Specification"</li> <li>Explanation of the draft proposal of the list of Operational Specification</li> <li>Outline of the expected final output of WG2</li> <li>Confirmation of the activity schedule</li> </ul>
2	13rd Apr, 2018	<ul style="list-style-type: none"> <li>Outline of the expected final output of the Operational Specification</li> <li>Confirmation of the activity schedule</li> </ul>
3	30th May, 2018	<ul style="list-style-type: none"> <li>Explanation of the draft proposal of the list of Operational Specification</li> <li>Re-issue and re-issue registration (Assignment)</li> <li>Card life cycle</li> </ul>
4	31st May, 2018	<ul style="list-style-type: none"> <li>Boarding and Alighting from railway, BRT and bus</li> </ul>
5	21st June, 2018	<ul style="list-style-type: none"> <li>Discussion on the Operational Specification</li> </ul>
6	5th July, 2018	<ul style="list-style-type: none"> <li>Interview about operation of railway, BRT and bus</li> </ul>

**Table 5: Working Group 3 Meetings**

No.	Date	Subject
1	12 <sup>th</sup> Apr, 2018	<ul style="list-style-type: none"> <li>Discussion on WG3 activity planning</li> </ul>

PM Form 3-1 Monitoring Sheet Summary

No.	Date	Subject
2	13 <sup>rd</sup> Apr, 2018	<ul style="list-style-type: none"> <li>➤ Confirmation on WBS, operation plan</li> <li>➤ Sharing the target deliverables of WG3 (AFC technical specification)</li> <li>➤ Review on AFC system interoperable use</li> <li>• Lecture for understanding of AFC system, basic terms and structure</li> <li>• Review and discussion on Hanoi AFC technical framework (3978) from interoperable perspective.</li> </ul>
3	21 <sup>st</sup> May, 2018	<ul style="list-style-type: none"> <li>• Explanation of AFC survey report on public transportation interoperability in Hanoi City. (BRT, Line2A, Line3, laws and regulatios)</li> <li>• Review on overview on AFC technical specification and IC card issuance process</li> <li>• Procedure on WG3 activities and planning for coming 3 month</li> </ul>
4	22 <sup>nd</sup> May, 2018	<ul style="list-style-type: none"> <li>• Understanding of AFC technical specification</li> <li>➤ Explanation and discussion on each AFC technical specification item. (ticket media, R/W, Smartcard IC format, Encoding process/format, common code, ticket validation, transaction data and set value, black list, trip pattern, host system)</li> </ul>
5	23 <sup>rd</sup> May, 2018	
6	24 <sup>th</sup> May, 2018	
7	25 <sup>th</sup> May, 2018	
8	28 <sup>rd</sup> May, 2018	
9	29 <sup>th</sup> May, 2018	
10	30 <sup>th</sup> May, 2018	
11	8 <sup>th</sup> June, 2018	
12	4 <sup>th</sup> June, 2018	<ul style="list-style-type: none"> <li>• Review of proposal of FMC by TRAMOC (2015):</li> </ul>
13	11 <sup>th</sup> June, 2018	<ul style="list-style-type: none"> <li>• Clarification key points of AFC interoperable technical specification for Hanoi</li> <li>➤ Acquire the important key point for AFC technical specification to be introduced in Hanoi city</li> <li>➤ Listing up the discussion items with other WGs.</li> </ul>
14	13 <sup>rd</sup> June, 2018	
15	15 <sup>th</sup> June, 2018	
16	26 <sup>th</sup> June, 2018	
17	27 <sup>th</sup> June, 2018	
18	29 <sup>th</sup> June, 2018	
19	4 <sup>th</sup> July, 2018	
20	27 <sup>th</sup> June, 2018	<ul style="list-style-type: none"> <li>• MKsmartfactory visit for IC card manufacturing tour and study on interoperable bus R/W.</li> </ul>
21	19 <sup>th</sup> July, 2018	<ul style="list-style-type: none"> <li>• Review of Drafted outline of AFC technical specification.</li> <li>➤ Create and review draft version of outline of AFC technical specification.</li> </ul>
22	23 <sup>rd</sup> July, 2018	
23	24 <sup>th</sup> July, 2018	
24	31 <sup>st</sup> July, 2018	
25	24 <sup>th</sup> July, 2018	<ul style="list-style-type: none"> <li>• Review BRT AFC document from Viettel</li> <li>• On site review of demonstration of AFC system for pilot test and confirmation of technical details with Transerco-Viettel BRT projet members</li> <li>• Review on summary of mainpoint discussed and Study of coping plan</li> <li>• Joint meeting with WG1, WG2 and WG4 to shaping consensus on main point discussed proposed by WG3</li> </ul>
26	27 <sup>th</sup> July, 2018	
27	8 <sup>th</sup> Aug, 2018	
28	10 <sup>th</sup> Aug, 2018	
29	14 <sup>th</sup> Aug, 2018	
30	16 <sup>th</sup> Aug, 2018	

**Table 6: Working Group 4 Meetings**

No.	Date	Subject
1	12 <sup>th</sup> April, 2018	<ul style="list-style-type: none"> <li>• Expected task of WG4 (Confirmation of TOR draft)</li> <li>• Expected roles and operation of FMC</li> </ul>
2	13 <sup>rd</sup> April, 2018	<ul style="list-style-type: none"> <li>• Confirmation of necessary tasks and explanation of TOR draft</li> <li>• Explanation of the draft outline of FMC and discussion on it</li> </ul>

3	18 <sup>th</sup> May, 2018	• Interview to Vietcom Bank about the IC card use in banking operation
4	19 <sup>th</sup> June, 2018	• Exchange of ideas with SBV about the draft outline of FMC, transportation IC card and non-cash payment
5	20 <sup>th</sup> June, 2018	• Discussion on roles of FMC

### 1.2.2 Output 1: 'Design Guideline and Specifications' for interoperable smart card system are developed.

The progress of Output 1 activities is shown in the table below.

**Table 7: Progress of Output 1 Activities**

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system including MRT, BRT and Bus in Hanoi	Collect the legal documents related to the transportation smart card system as follows,; <ul style="list-style-type: none"> <li>✓ Legal systems and standards on smart card system/ transportation smart card system</li> <li>✓ Design documents of smart card system</li> <li>✓ International standards for interoperable AFC system</li> <li>✓ MRT 2A, 3: AFC technical design</li> <li>✓ MRT 2: AFC technical specifications</li> <li>✓ BRT1, Route Bus: Specifications and planning documents to introduce</li> <li>✓ Hanoi City and MOT: Legal system and decision about technical standardization of AFC</li> <li>✓ Central Bank: Decision, regulations, standard regarding smart card and electric money</li> </ul>	- Done	- No activity (N/A)
1-2 Prepare an outline of 'Design Guideline and Specifications' and the fare policy	1) Examination of ticket specifications for interoperable use 2) Examination of fare system rules for interoperable use 3) Examination of the operational specifications 4) Examination of the technical specifications	- On-going	- Continue the on-going activities
1-3 Consult with the relevant authorities and finalize the concepts of the 'Design Guideline and Specifications' and the		-	-

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
fare policy.			
1-4 Preparation of the drafts of the 'Design Guideline and Specifications' and the fare policy		-	-
1-5 Consult with the relevant authorities and finalize the 'Design Guideline and Specifications' and the fare policy		-	-
1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.		-	-

### 1.2.3 Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.

The progress of Output 2 activities is shown in the table below.

**Table 8: Progress of Output 2 Activities**

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	1) Conduct a survey of relevant laws and regulations 2) Define the scope of work of the Fare Management Center (division)	- On-going	- Continue the on-going activities
2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).	Define the basic six items of operational terms of reference of FMC	- On-going	- Continue the on-going activities
2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare		-	-

PM Form 3-1 Monitoring Sheet Summary

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
Management Center (Division).			
2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.	1) Prepare a TOR 2) Organizational structure and staff requirements	-	-

**1.3 Achievement of Output**

**1.3.1 Output 1**

Achievement status of Output 1 is as follows.

**Table 9: Verifiable Indicators and Current Status**

Objectively Verifiable Indicator	Baseline	Current Status
The Design Guideline and Specification is prepared.		

Source: PDM 1.1

**1.3.2 Output 2**

Achievement status of Output 2 is as follows.

**Table 10: Verifiable Indicators and Current Status**

Objectively Verifiable Indicator	Baseline	Current Status
Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval	-	-

Source: PDM 1.1

**1.4 Achievement of the Project Purpose**

Also stated in PDM, the achievement of the project purpose shall be evaluated using verifiable indicators.

**Table 11: Verifiable Indicators and Current Status**

Objectively verifiable indicators	Baseline	Current Status
- 'Design Guideline and Specifications' are approved by HPC Bus system improvement plan	-	-
- The public transport fare policy is established	-	-

Source: PDM 1.1

To achieve the project purpose, the JICA Project Team (JPT) identify the required knowledge and skills by each output shown in the following table. Result of the baseline survey were evaluated on a five-level scale as indicated below and illustrated in following figures.

- (1) Newbie: I don't know the process/ concept;
- (2) Novice: I know the process/ concept, but I have never done it;
- (3) Young Expert: I have done it once, but I have not reported or presented the results;
- (4) Expert: I have done it twice or more/ I have done it once and reported or presented the results; and
- (5) Senior Expert: I have done it twice or more, and reported or presented the results.

**Table 12 Required Knowledge and Skills per Project Output and Activity**

Expected Output	Activities	Required Knowledge & Skills
(1) The 'Design Guideline and Specification' is prepared.	1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system including MRT, BRT and Bus in Hanoi	Information collection capability, Issue solving capability
	1-2 Prepare of outline of 'Design Guideline and Specifications' and the fare policy	(1) Basic knowledge of a) Ticket specifications, b) Fare system c) Operation system d) Technical specification e) Host system  (2) Capability for development of a) Rules for common ticket b) Rules for fare c) Rules for operation specification d) Rules for technology implementing specification e) Host system specification
	1-3 Consult with the relevant authorities and finalize the concepts of the 'Design Guideline and Specifications' and the fare policy.	
	1-4 Preparation of the drafts of the 'Design Guideline and Specifications' and the fare policy	
	1-5 Consult with the relevant authorities and finalize the 'Design Guideline and Specifications' and the fare policy	
	1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.	
(2) Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval	2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	(1) Information collection capability (2) Issue solving capability
	2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).	(1) Basic knowledge of the scope of works (functions) (2) Capability for development of the scope of work(function)
	2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division).	(1) Basic knowledge of work description (2) Capability for development of work description
	2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.	(1) Basic knowledge of a) Operational terms of reference b) Terms of reference for staffing (2) Capability for development of rules for operation and management of Fare Management Center

The first baseline survey was conducted in xxx 2018 to measure the current knowledge and skills level. The average scores are shown in the following table and each scores are in the following figures.

**Table 13 Average Scores per Outputs**

Survey	Output	
	1	2
Baseline Survey (xxx 2018)		

**1.5 Changes of Risks and Actions for Mitigation**

**1.6 Progress of Actions undertaken by JICA**

**1.7 Progress of Actions undertaken by The People’s Committee of Hanoi**

**1.8 Progress of Environmental and Social Considerations (if applicable)**

**1.9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)**

**1.10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)**

**1.11 Tasks to be implemented by JICA Project Team and Counterparts**

Work	Tasks	Implementing agencies
Output 1: 'Design Guideline and Specifications' for interoperable smart card system are developed		
Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.		



**2 Delay of Work Schedule and/or Problems (if any)**

**2.1 Detail**

**2.2 Cause**

**2.3 Action to be taken**

**2.4 Roles of Responsible Persons/Organization (JICA, The People's Committee of Hanoi, etc.)**

**3 Modification of the Project Implementation Plan**

**3.1 PO**

**3.2 Other modifications on detailed implementation plan**

**II. Project Monitoring Sheet I & II**     *as Attached*

**Project Monitoring Sheet I (Project Design Matrix)**

Version 2

Project title: Project for Supporting Development of Interoperable Smart Card System for Public Transportation in Hanoi

Dated. 22 August. 2018

Project Area: Hanoi

Target Group: Hanoi People's Committee (HPC) and organizations related to public transportation in Hanoi

Counterpart: HPC (Hanoi Department of Transport (DOT), Hanoi Department of Science and Technology (DOST), Hanoi Department of Information and Communication (DOIC), Hanoi Metro Company (HMC), Hanoi Transport Corporation (TRANSERCO))

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption	Achievement	Remarks
<b>Overall Goal</b>					
Interoperable smart card systems are developed for the public transportation in Hanoi	<ul style="list-style-type: none"> <li>Number of public transport operators applying the 'Design Guideline and Specifications' developed under the Project to realize interoperable smart card system.</li> <li>Ratio of satisfaction on interoperable smart card is more than XX%.</li> </ul>	<ul style="list-style-type: none"> <li>Survey report(s)</li> </ul>			
<b>Project Purpose</b>					
Technical and management capacities of counterpart agencies under HPC are improved for the development of interoperable smart card system for public transportation in Hanoi	<ul style="list-style-type: none"> <li>'Design Guideline and Specifications' are approved by HPC.</li> <li>The public transport fare policy is established.</li> </ul>	<ul style="list-style-type: none"> <li>Approved 'Design Guideline and Specifications'</li> <li>Project progress report</li> </ul>	Decision no. 3978/QD-UBND dated 13 August 2015 on use of interoperable smart card in public transportation in Hanoi continues to be effective.		
<b>Outputs</b>					
1. 'Design Guideline and Specifications' for interoperable smart card system are developed.	'Design Guideline and Specifications' are finalized.	'Design Guideline and Specifications' (final version)	HPC reviews policy/ documents developed under the Project in a timely manner.		
2. Organization terms of reference of each unit of the Fare Management Center (Division) are developed.	Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval.	Organizational terms of reference for the Fare Management Center (Division) (draft for approval)			

Activities	Input		Pre-conditions
	Japanese Side	Vietnamese Side	
1-1. Collect and analyze information on the existing and approved smart card systems for the public transportation system in Hanoi	1. Japanese Experts - Leader - Public Transport Fare Policy and System - Interoperable Smart Card System - Communication System - Fare Management System	1. Project Counterparts (1) HPC (2) HDOT - Road Transportation Management Division - Planning and Investment Division - Economics planning Division - TRAMOC (3) DOST (4) DOIC (5) HMC (6) TRANSERCO	Official request to apply for Japan's ODA Loan Project.
1-2. Prepare an outline of 'Design Guideline and Specifications' and fare policy  1) Examination of fare ticket specifications for interoperable use 2) Examination of fare system rules for interoperable use 3) Examination of the operation rules 4) Examination of the technical specifications	2. Counterpart Training in Japan  3. Seminar and workshop  4. Other cost - Local experts and consultants - Local staff - Others (survey, card rental, etc.)	2. Provision of Office Space and equipment  3. Cost for - counterpart members - office operation and maintenance - others (local travel expenses excluding airfare for Vietnamese side, etc.)	
1-3. Consult with the relevant authorities and finalize the outline of the 'Design Guideline and Specifications' and fare policy			
1-4. Draft a 'Design Guideline and Specifications' with fare policy			
1-5. Consult with the relevant authorities and finalize the 'Design Guideline and Specifications'			
1-6. Conduct seminar(s) to introduce the draft 'Design Guideline Specifications' and fare policy			
2-1. Define the scope of work to be performed by the proposed Fare Management Center (Division)  1) Conduct a survey of relevant laws and regulations 2) Define the scope of work of the fare management center (division)			
2-2. Define the tasks and responsibilities of departments/division under the Fare Management Center (Division)			
2-3. Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division)			
2-4. Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.  1) Prepare a TOR 2) Organizational structure and staff requirements			



## PROJECT MONITORING SHEET

**Project Title:** The Project for Supporting Development of Interoperable Smart Card System for Public Transport in Hanoi

**Version of the Sheet:** Ver. 3 (Term: 2017 - 2019)

**Name:** Mr. Michimasa TAKAGI

**Title:** Team Leader/ Urban Public Transport

**Submission Date:** June 2019

### I. Summary

#### 1 Progress

This monitoring sheet covers the period from project commencement in **December 2017** up to **the end of May 2019**.

#### 1.1 Progress of Inputs

##### 1.1.1 Experts

**Table 1: Input of Experts as of End-July**

Designation	Name	No. of PMs
Team Leader/ Urban Public Transport	M. TAKAGI	5.47
Deputy Team Leader/ AFC Technical Management	T. OTSUKI	5.37
Public Transport Fare Policy [Railway]	S. HORIUCHI	2.92
Public Transport Fare Policy [Railway]	R. SAITO	0.50
Public Transport Fare Policy [Bus]	T. KUMAI	1.80
Interoperable Smart Card Plan	T. UMEKAWA	0.67
Smart Card Data Management and Utilization	N. MIZOGUCHI	0.00
Interoperable Smart Card System [Railway]	T. FUKATSU	3.07
Interoperable Smart Card System [Bus]1	A. TANAKA	2.43
Interoperable Smart Card System [Bus]2	H. MIYAHARA	1.70
Communication System	K. HONDA	2.10
Fare Management System [AFC Technical Specification]	H. KUWANO	0.57

Fare Management System [AFC Technical Specification]	Y. WATABE	3.67
Fare Management system [AFC Host System]	Y. SAKAMOTO	0.50
Organization Institution	A. SAKUMA	1.07
Monitoring/ Training in Japan/ Coordination	M. OHNO	2.40
TOTAL PMs		33.74 (61.3%)
Planned PMs		55.00

## 1.2 Progress of Activities

### 1.2.1 Joint Coordinating Committee and Working Group Meetings

Three Joint Coordinating Committee (JCC) meeting and several working group (WG) meetings were held during the period.

**Table 2: Joint Coordinating Committee and Working Group Meetings**

Meetings Conducted	Participated Agency	Key Agenda	Date
First JCC meeting	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Outline of Work Plan (Draft) 2) Confirmation of the Undertakings by Vietnamese Side	2 February 2018
Second JCC Meeting	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Progress of the project 2) Proposal from WG 3) Items to be confirmed by Hanoi-city 4) Activity plans	22 August 2018
Third JCC Meeting	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Achievements in the 1st Year 2) Explanation for Outline of 'Design Guideline and Specifications 'and Fare Policy 3) Activities in Next Period	7 November 2018

Meetings Conducted	Participated Agency	Key Agenda	Date
1st WG Leader Meeting	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Ideal AFC Model in Hanoi 2) Confirmation of 2nd JCC	23 August 2018
2nd WG Leader Meeting	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Progress of the project since last JCC meeting 2) Response to the notice by HPC 3) Confirmation of the materials and preparations for the seminar	4 December 2018
3rd WG Leader Meeting	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Reflection of the seminar for the formulation of Outline Report 2) Site Visit at TRAMOC (Bus Operator) Demo for Bus unit	6 December 2018

Meetings Conducted	Participated Agency	Key Agenda	Date
1st Seminar	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	Project Overview and Introduction of Basic Approach on Interoperable Smart Card System for Public Transportation in Hanoi	5 December 2018

**Table 3: Working Group 1 Meetings**

No.	Date	Subject
1	16th Apr, 2018	<ul style="list-style-type: none"> <li>Outline of the expected output of WG1</li> <li>Confirmation of the activity schedule</li> </ul>
2	29rd May, 2018	<ul style="list-style-type: none"> <li>Explanation of the Fare Management System in Japan</li> </ul>
3	30th May, 2018	<ul style="list-style-type: none"> <li>Discussion on the feasibility to install each system into Hanoi</li> </ul>
4	5th Jun, 2018	<ul style="list-style-type: none"> <li>Explanation of the Fare Management System in other countries</li> </ul>
5	25th Jul, 2018	<ul style="list-style-type: none"> <li>Clarification of the items to be discussed</li> <li>Discussion on the reporting to the 2nd JCC</li> </ul>
6	19th Sep, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents of outline report</li> </ul>
7	20th Sep, 2018	<ul style="list-style-type: none"> <li>Explanation of transfer discount in other countries</li> </ul>
8	28th Nov, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents of seminar</li> <li>Confirmation of items to be discussed in the upcoming WG1</li> </ul>
9	7th Dec, 2018	<ul style="list-style-type: none"> <li>Confirmation of distance-based fare</li> <li>Discussion on ticket type</li> </ul>
10	14th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion on the way of transfer discount</li> </ul>
11	17th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion on ticket types and information on card surface</li> </ul>
12	22nd Jan, 2019	<ul style="list-style-type: none"> <li>Confirmation of the result of discussion and table of contents of the output</li> </ul>
13	26th Feb, 2019	<ul style="list-style-type: none"> <li>Confirmation of contents of fare system guideline (proposed)</li> </ul>
14	14th Mar, 2019	<ul style="list-style-type: none"> <li>Confirmation of the comment from Vietnamese side against fare system guideline (proposed)</li> </ul>
15	20th Mar, 2019	<ul style="list-style-type: none"> <li>Reconfirmation of the whole structure of outputs in line with the work plan</li> <li>Confirmation of the tasks from April</li> </ul>
16	25th Mar, 2019	<ul style="list-style-type: none"> <li>Confirmation of the response toward the comments from Vietnamese side against fare system guideline (proposed)</li> </ul>

**Table 4: Working Group 2 Meetings**

No.	Date	Subject
1	12th Apr, 2018	<ul style="list-style-type: none"> <li>Procedure on WG2 activities "Development of Operational Specification"</li> <li>Explanation of the draft proposal of the list of Operational Specification</li> <li>Outline of the expected final output of WG2</li> <li>Confirmation of the activity schedule</li> </ul>
2	13rd Apr, 2018	<ul style="list-style-type: none"> <li>Outline of the expected final output of the Operational Specification</li> <li>Confirmation of the activity schedule</li> </ul>
3	30th May, 2018	<ul style="list-style-type: none"> <li>Explanation of the draft proposal of the list of Operational Specification</li> <li>Re-issue and re-issue registration (Assignment)</li> <li>Card life cycle</li> </ul>
4	31st May, 2018	<ul style="list-style-type: none"> <li>Boarding and Alighting from railway, BRT and bus</li> </ul>
5	21st June, 2018	<ul style="list-style-type: none"> <li>Discussion on the Operational Specification</li> </ul>
6	5th July, 2018	<ul style="list-style-type: none"> <li>Interview about operation of railway, BRT and bus</li> </ul>

7	21st Aug, 2018	• Confirmation of the contents of outline report
8	6th Nov, 2018	• Discussion on the operational flow in the use of interoperable IC card
9	8th Nov, 2018	• Discussion on the operational flow in the use of interoperable IC card
10	4th Dec, 2018	• Discussion on the operational flow in the use of interoperable IC card
11	18th Dec, 2018	• Discussion on the operational flow in the use of interoperable IC card
12	22nd Jan, 2019	• Discussion on the operational flow in the use of interoperable IC card
13	24th Jan, 2019	• Discussion on the operational flow in the use of interoperable IC card
14	26th Mar, 2019	• Discussion on the operational flow in the use of interoperable IC card
15	29th May, 2019	• Discussion on the operational flow in the use of interoperable IC card

**Table 5: Working Group 3 Meetings**

No.	Date	Subject
1	12th Apr, 2018	• Discussion on WG3 activity planning
2	13rd Apr, 2018	<ul style="list-style-type: none"> <li>➢ Confirmation on WBS, operation plan</li> <li>➢ Sharing the target deliverables of WG3 (AFC technical specification)</li> <li>➢ Review on AFC system interoperable use</li> </ul> • Lecture for understanding of AFC system, basic terms and structure • Review and discussion on Hanoi AFC technical framework (3978) from interoperable perspective.
3	21st May, 2018	<ul style="list-style-type: none"> <li>• Explanation of AFC survey report on public transportation interoperability in Hanoi City. (BRT, Line2A, Line3, laws and regulations)</li> <li>• Review on overview on AFC technical specification and IC card issuance process</li> <li>• Procedure on WG3 activities and planning for upcoming 3 months</li> </ul>
4	22nd May, 2018	• Understanding of AFC technical specification
5	23rd May, 2018	➢ Explanation and discussion on each AFC technical specification item.
6	24th May, 2018	(ticket media, R/W, Smartcard IC format, encoding process/format,
7	25th May, 2018	common code, ticket validation, transaction data and set value, black list,
8	28rd May, 2018	trip pattern, host system)
9	29th May, 2018	
10	30th May, 2018	
11	8th June, 2018	
12	4th June, 2018	• Review of proposal of FMC by TRAMOC (2015):
13	11th June, 2018	• Clarification key points of AFC interoperable technical specification for Hanoi
14	13rd June, 2018	➢ Acquire the important key point for AFC technical specification to be
15	15th June, 2018	introduced in Hanoi city
16	26th June, 2018	➢ Listing up the discussion items with other WGs.
17	27th June, 2018	
18	29th June, 2018	
19	4th July, 2018	
20	27th June, 2018	• MKsmartfactory visit for IC card manufacturing tour and study on interoperable bus R/W.
21	19th July, 2018	• Review of Drafted outline of AFC technical specification.
22	23rd July, 2018	➢ Create and review draft version of outline of AFC technical specification.
23	24th July, 2018	
24	31st July, 2018	
25	24th July, 2018	• Review BRT AFC document from Viettel
26	27th July, 2018	

PM Form 3-1 Monitoring Sheet Summary

27	8th Aug, 2018	<ul style="list-style-type: none"> <li>On site review of demonstration of AFC system for pilot test and confirmation of technical details with Transerco-Viettel BRT project members</li> <li>Review on summary of main point discussed and Study of coping plan</li> <li>Joint meeting with WG1, WG2 and WG4 to shaping consensus on main point discussed proposed by WG3</li> </ul>
28	10th Aug, 2018	
29	14th Aug, 2018	
30	16th Aug, 2018	
31	21st Aug, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents to be reported in JCC (Discussion on role sharing in formulation of the technical specifications)</li> </ul>
32	24th Aug, 2018	<ul style="list-style-type: none"> <li>Discussion on host system specifications</li> </ul>
33	7th Sep, 2018	<ul style="list-style-type: none"> <li>Discussion on contents and sharing of work between Japanese and Vietnamese sides in formulation of the technical specifications (common code)</li> </ul>
34	5th Nov, 2018	<ul style="list-style-type: none"> <li>Site visit at depots of three local bus companies*. Investigation was conducted in terms of infrastructure related to system and network and amount of data to be dealt with at each depot, for the purpose of establishment of AFC system suitable for the actual bus operation.</li> <li>*Nam Ha Noi Bus company, Cau Buou bus company (142 bus, 11 line), Tan Dat bus company (68 bus, 5 line)</li> </ul>
35	6th Nov, 2018	<ul style="list-style-type: none"> <li>Confirmation of contents of JCC meeting</li> <li>Discussion on technical specifications (proposed common code)</li> </ul>
36	8th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on proposed AFC system structure suitable for bus services</li> </ul>
37	9th Nov, 2018	<ul style="list-style-type: none"> <li>Site visit at Line 2A. Inspection of installed AFC facility, IC card and operation, and investigation for tasks to be tackled for formulation of common specifications are conducted.</li> <li>Survey of actual AFC trial operation in BRT</li> </ul>
38	28th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on specifications for common code, which is used to process data in interoperable use</li> </ul>
39	7th Nov, 2018	<ul style="list-style-type: none"> <li>Technical Specifications (discussion on encode format)</li> </ul>
40	17th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
41	19th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
42	21st Dec, 2018	<ul style="list-style-type: none"> <li>Technical Specifications (discussion on encode format)</li> </ul>
43	25th Dec, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
44	11th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (common code, format)</li> </ul>
45	16th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (reader/writer)</li> </ul>
46	17th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (encode process)</li> </ul>
47	22nd Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (trip pattern)</li> </ul>
48	24th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (host system)</li> </ul>
49	19th Feb, 2019	<ul style="list-style-type: none"> <li>Discussion on installation of IC card in buses with TRANSERCO</li> </ul>
50	20th Feb, 2019	<ul style="list-style-type: none"> <li>Discussion on work plan and role sharing in 2019</li> <li>Sharing opinion with Mr. Hai (director of TRAMOC) about how to move WG3 forward</li> <li>Confirmation of list of tasks and role sharing in formulation of technical specifications</li> </ul>
51	21st Jan, 2019	<ul style="list-style-type: none"> <li>Interview with NAPAS about how to apply IC card to other transport</li> <li>Discussion with Ms. Huong on tasks and solutions in the process of project</li> </ul>



52	17th Apr, 2019	<ul style="list-style-type: none"> <li>• Site visit at Payoo Corporation to survey the situation of Fintech, which is used for ABT system</li> <li>• Site visit at pilot trial at Ho Chi Minh bus, in which ABT system is installed (create an account of ZaloPay, apply for UniPass, issue IC card, take a bus)</li> <li>• Sharing opinion with iTD Company, one of the most promising IT company in Vietnam, about ABT and CBT in the structure of AFC system</li> </ul>
53	19th Apr, 2019	<ul style="list-style-type: none"> <li>• Discussion with Vietnamese members about the main text of technical specifications <ul style="list-style-type: none"> <li>➢ Confirmation of progress in outline (to be tackled after conclusion of HPC meeting)</li> </ul> </li> </ul>
54	22nd Apr, 2019	<ul style="list-style-type: none"> <li>• Discussion with Vietnamese members about the main text of technical specifications <ul style="list-style-type: none"> <li>➢ Confirmation of items, schedule and role sharing</li> <li>➢ Vietnamese side raised a problem in lack of resources to be used to contents confirmation</li> </ul> </li> </ul>
55	24th Apr, 2019	<ul style="list-style-type: none"> <li>• Sharing opinion with R&amp;D sector, NAPAS</li> </ul>
56	28th May, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for common code</li> </ul>
57	30th May, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for common code</li> </ul>

**Table 6: Working Group 4 Meetings**

No.	Date	Subject
1	21st Aug, 2018	<ul style="list-style-type: none"> <li>• Confirmation of contents of outline report</li> </ul>
2	5th Nov, 2018	<ul style="list-style-type: none"> <li>• Discussion on organizational structure and staffing requirements under FMC</li> </ul>
3	6th Dec, 2018	<ul style="list-style-type: none"> <li>• Discussion on organizational structure and staffing requirements under FMC</li> </ul>
4	19th Dec, 2018	<ul style="list-style-type: none"> <li>• Discussion on organizational structure and staffing requirements under FMC</li> </ul>
5	21st Dec, 2018	<ul style="list-style-type: none"> <li>• Discussion on contents of outline report</li> </ul>
6	23rd Jan, 2019	<ul style="list-style-type: none"> <li>• Discussion on organizational structure and staffing requirements under FMC</li> </ul>
7	27th Mar, 2019	<ul style="list-style-type: none"> <li>• Discussion on organizational structure and staffing requirements under FMC</li> </ul>
8	30th May, 2019	<ul style="list-style-type: none"> <li>• Discussion on organizational structure and staffing requirements under FMC</li> </ul>

### 1.2.2 Output 1: 'Design Guideline and Specifications' for interoperable smart card system are developed.

The progress of Output 1 activities is shown in the table below.

**Table 7: Progress of Output 1 Activities**

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system including MRT, BRT and Bus in Hanoi	Collect the legal documents related to the transportation smart card system as follows;; <ul style="list-style-type: none"> <li>✓ Legal systems and standards on smart card system/ transportation smart card system</li> <li>✓ Design documents of smart card system</li> </ul>	- Done	- No activity (N/A)

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
	<ul style="list-style-type: none"> <li>✓ International standards for interoperable AFC system</li> <li>✓ MRT 2A, 3: AFC technical design</li> <li>✓ MRT 2: AFC technical specifications</li> <li>✓ BRT1, Route Bus: Specifications and planning documents to introduce</li> <li>✓ Hanoi City and MOT: Legal system and decision about technical standardization of AFC</li> <li>✓ Central Bank: Decision, regulations, standard regarding smart card and electric money</li> </ul>		
1-2 Prepare an outline of 'Design Guideline and Specifications' and the fare policy	<ol style="list-style-type: none"> <li>1) Examination of ticket specifications for interoperable use</li> <li>2) Examination of fare system rules for interoperable use</li> <li>3) Examination of the operational specifications</li> <li>4) Examination of the technical specifications</li> </ol>	- Done	- No activity (N/A)
1-3 Consult with the relevant authorities and finalize the concepts of the 'Design Guideline and Specifications' and the fare policy.	-	- Done	- No activity (N/A)
1-4 Preparation of the drafts of the 'Design Guideline and Specifications' and the fare policy	-	- Completed Detailed Outline	- Based on the Detailed Outline, the Working Groups will continue to prepare the output.
1-5 Consult with the relevant authorities and finalize the 'Design Guideline and Specifications' and the fare policy	-	- On going	- To be completed at last in one month before Project is ended.
1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.	- The 1 <sup>st</sup> Seminar was held on 5 December 2018.	- On going	- Continue discussion for the 2 <sup>nd</sup> Seminar

### 1.2.3 Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.

The progress of Output 2 activities is shown in the table below.

**Table 8: Progress of Output 2 Activities**

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	1) Conduct a survey of relevant laws and regulations 2) Define the scope of work of the Fare Management Center (division)	- Done	- No activity (N/A)
2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).	Define the basic six items of operational terms of reference of FMC	- Completed the Draft.	- Continue discussion for final version
2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division).	-	- To be done soon.	- No activity (N/A)
2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.	1) Prepare a TOR 2) Organizational structure and staff requirements	- On going	- On going

### 1.3 Achievement of Output

#### 1.3.1 Output 1

Achievement status of Output 1 is as follows.

**Table 9: Verifiable Indicators and Current Status**

Objectively Verifiable Indicator	Baseline	Current Status
The Design Guideline and Specification is prepared.	None	On going

Source: PDM 1.1

#### 1.3.2 Output 2

Achievement status of Output 2 is as follows.

**Table 10: Verifiable Indicators and Current Status**

Objectively Verifiable Indicator	Baseline	Current Status
Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval	None	On going

Source: PDM 1.1

#### 1.4 Achievement of the Project Purpose

Also stated in PDM, the achievement of the project purpose shall be evaluated using verifiable indicators.

**Table 11: Verifiable Indicators and Current Status**

Objectively verifiable indicators	Baseline	Current Status
- 'Design Guideline and Technical Specifications' are approved by HPC	None	On going
- The public transport fare policy is established	None	On going

Source: PDM 1.1

To achieve the project purpose, the JICA Project Team (JPT) identify the required knowledge and skills by each output shown in the following table. Result of the baseline survey were evaluated on a five-level scale as indicated below and illustrated in following figures.

- (1) Newbie: I don't know the process/ concept;
- (2) Novice: I know the process/ concept, but I have never done it;
- (3) Young Expert: I have done it once, but I have not reported or presented the results;
- (4) Expert: I have done it twice or more/ I have done it once and reported or presented the results;  
and
- (5) Senior Expert: I have done it twice or more, and reported or presented the results.

**Table 12 Required Knowledge and Skills per Project Output and Activity**

Expected Output	Activities	Required Knowledge & Skills
(1) The 'Design Guideline and Specification' is prepared.	1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system including MRT, BRT and Bus in Hanoi	Information collection capability, Issue solving capability
	1-2 Prepare of outline of 'Design Guideline and Specifications' and the fare policy	(1) Basic knowledge of a) Ticket specifications, b) Fare system c) Operation system d) Technical specification e) Host system (2) Capability for development of a) Rules for common ticket b) Rules for fare c) Rules for operation specification d) Rules for technology implementing specification e) Host system specification
	1-3 Consult with the relevant authorities and finalize the concepts of the 'Design Guideline and Specifications' and the fare policy.	
	1-4 Preparation of the drafts of the 'Design Guideline and Specifications' and the fare policy	
	1-5 Consult with the relevant authorities and finalize the 'Design Guideline and Specifications' and the fare policy	
	1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.	
(2) Organizational terms of reference for the proposed	2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	

Expected Output	Activities	Required Knowledge & Skills
Fare Management Center (Division) is drafted and submitted for approval	2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).	(1) Basic knowledge of the scope of works (functions) (2) Capability for development of the scope of work(function)
	2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division).	(1) Basic knowledge of work description (2) Capability for development of work description
	2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.	(1) Basic knowledge of a) Operational terms of reference b) Terms of reference for staffing (2) Capability for development of rules for operation and management of Fare Management Center

The first baseline survey was conducted in April 2018 to measure the current knowledge and skills level. The average scores are shown in the following table.

**Table 13 Average Scores per Outputs**

Survey	Output	
	1	2
Baseline Survey (April 2018)	2.49	3.33
When basic policy was formulated (December 2018)	3.03	3.67

### 1.5 Changes of Risks and Actions for Mitigation

N/A

### 1.6 Progress of Actions undertaken by JICA

N/A

### 1.7 Progress of Actions undertaken by The People's Committee of Hanoi

N/A

### 1.8 Progress of Environmental and Social Considerations (if applicable)

N/A

### 1.9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

N/A

### 1.10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

Project is implemented in the context of many movements/fluctuations. Such as Line 2A, Line 3 in the completion process, pilot smart card on BRT Line... Especially, Hanoi started to develop a smart city... They create new several requirements for Project.

**1.11 Tasks to be implemented by JICA Project Team and Counterparts**

Work	Tasks	Implementing agencies
Output 1: 'Design Guideline and Specifications' for interoperable smart card system are developed		
N/A	N/A	N/A
Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.		
N/A	N/A	N/A

**2 Delay of Work Schedule and/or Problems (if any)**

**2.1 Cause**

**First Reason: Working time of Working Groups is affected due to the delay of Working Groups Establishment**

Working Groups were proposed to be established very soon in February 2018 as agreed by both sides at the 1st JCC Meeting on 02/02/2018, however, after almost 2 months of delay, finally Working groups were established on 29/3/2018 by the Decision No. 341/QD-SGTVT dated 29 March 2018. During the implementation, Vietnamese member list was revised once by the Decision No. 920/QD-SGTVT dated 4 June 2018.

**Second Reason: Approval on Detailed Outline was delayed due to time consuming for Consideration on ABT technology issue**

Detailed Outline of Design Guideline and Technical Specifications was prepared based on CBT technology according to Decision 3978/QD-UBND and it was submitted to get approval since 17 Jan 2019 for approval. Meanwhile, in order to develop Smart city, Hanoi city has been considering whether ABT technology is applied or not. After Hanoi city gave conclusion about this issue based on discussions with Project Expert Team about the comparison between ABT technology and CBT technology, Detailed Outline was officially approved in 26/04/2019, which took about 3 months since its submission.

During waiting-for-approval- period, Working Groups did not entirely stop their activities, but they could not work sufficiently because they could only discuss what contents not affected by approval results.

**Third reason: Time consuming for consulting with authorized organizations and complete Outputs**

Consulting with authorized organizations and complete "Design Guideline and Technical Specifications", "Fare Policy" and "Terms of Reference of FMC" are our planned activities. However, from practical experiences, as above mentioned, this task lasts relatively long time, especially Project Outputs are highly technical and/or quite sensitive in terms of organization. Therefore, Vietnamese side tends to take more time than planned to review, study, give comments.

**2.2 Action to be taken**

Due to above mentioned delays, in order to achieve the outputs as planned, it is considered to be necessary to extend the Project implementation duration.

Project extension will help Working Group members and Project Expert Team to have enough valuable time for technology transfer at necessary level and to ensure its sustainability. JET should continue to discuss extension of project period with JICA and HDOT.

**2.3 Roles of Responsible Persons/Organization (JICA, The People's Committee of Hanoi, etc.)**

N/A

**3 Modification of the Project Implementation Plan**

**3.1 PO**

**3.2 Other modifications on detailed implementation plan**

**II. Project Monitoring Sheet I & II** *as Attached*

**Project Monitoring Sheet I (Project Design Matrix)**

**Version 3**

**Project title:** Project for Supporting Development of Interoperable Smart Card System for Public Transportation in Hanoi

**Dated. 10 June 2019**

**Project Area:** Hanoi

**Target Group:** Hanoi People's Committee (HPC) and organizations related to public transportation in Hanoi

**Counterpart:** HPC (Hanoi Department of Transport (DOT), Hanoi Department of Science and Technology (DOST), Hanoi Department of Information and Communication (DOIC), Hanoi Metro Company (HMC), Hanoi Transport Corporation (TRANSERCO))

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption	Achievement	Remarks
<b>Overall Goal</b>					
Interoperable smart card systems are developed for the public transportation in Hanoi	<ul style="list-style-type: none"> <li>Number of public transport operators applying the 'Design Guideline and Specifications' developed under the Project to realize interoperable smart card system.</li> <li>Ratio of satisfaction on interoperable smart card is more than XX%.</li> </ul>	Survey report(s)			
<b>Project Purpose</b>					
Technical and management capacities of counterpart agencies under HPC are improved for the development of interoperable smart card system for public transportation in Hanoi	<ul style="list-style-type: none"> <li>'Design Guideline and Specifications' are approved by HPC.</li> <li>The public transport fare policy is established.</li> </ul>	<ul style="list-style-type: none"> <li>Approved 'Design Guideline and Specifications'</li> <li>Project progress report</li> </ul>	Decision no. 3978/QD-UBND dated 13 August 2015 on use of interoperable smart card in public transportation in Hanoi continues to be effective.		
<b>Outputs</b>					
1. 'Design Guideline and Specifications' for interoperable smart card system are developed.	'Design Guideline and Specifications' are finalized.	'Design Guideline and Specifications' (final version)	HPC reviews policy/documents developed under the Project in a timely manner.		
2. Organization terms of reference of each unit of the Fare Management Center (Division) are developed.	Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval.	Organizational terms of reference for the Fare Management Center (Division) (draft for approval)			

Activities	Input		Pre-conditions
	Japanese Side	Vietnamese Side	
1-1. Collect and analyze information on the existing and approved smart card systems for the public transportation system in Hanoi	1. Japanese Experts - Leader - Public Transport Fare Policy and System - Interoperable Smart Card System - Communication System - Fare Management System	1. Project Counterparts (1) HPC (2) HDOT - Road Transportation Management Division - Planning and Investment Division - Economics planning Division - TRAMOC (3) DOST (4) DOIC (5) HMC (6) TRANSERCO 2. Provision of Office Space and equipment 3. Cost for - counterpart members - office operation and maintenance - others (local travel expenses excluding airfare for Vietnamese side, etc.)	Official request to apply for Japan's ODA Loan Project.
1-2. Prepare an outline of 'Design Guideline and Specifications' and fare policy  1) Examination of fare ticket specifications for interoperable use 2) Examination of fare system rules for interoperable use 3) Examination of the operation rules 4) Examination of the technical specifications	2. Counterpart Training in Japan  3. Seminar and workshop  4. Other cost - Local experts and consultants - Local staff - Others (survey, card rental, etc.)		
1-3. Consult with the relevant authorities and finalize the outline of the 'Design Guideline and Specifications' and fare policy			
1-4. Draft a 'Design Guideline and Specifications' with fare policy			
1-5. Consult with the relevant authorities and finalize the 'Design Guideline and Specifications'			
1-6. Conduct seminar(s) to introduce the draft 'Design Guideline Specifications' and fare policy			
2-1. Define the scope of work to be performed by the proposed Fare Management Center (Division)  1) Conduct a survey of relevant laws and regulations 2) Define the scope of work of the fare management center (division)			
2-2. Define the tasks and responsibilities of departments/division under the Fare Management Center (Division)			
2-3. Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division)			
2-4. Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.  1) Prepare a TOR 2) Organizational structure and staff requirements			





## PROJECT MONITORING SHEET

**Project Title:** The Project for Supporting Development of Interoperable Smart Card System for Public Transport in Hanoi

**Version of the Sheet:** Ver. 4 (Term: 2017 - 2019)

**Name:** Mr. Michimasa TAKAGI

**Title:** Team Leader/ Urban Public Transport

**Submission Date:** August 2019

### I. Summary

#### 1 Progress

This monitoring sheet covers the period from project commencement in **December 2017** up to **the end of July 2019**.

#### 1.1 Progress of Inputs

##### 1.1.1 Experts

**Table 1: Input of Experts as of End-July**

Designation	Name	No. of PMs
Team Leader/ Urban Public Transport	M. TAKAGI	5.47
Deputy Team Leader/ AFC Technical Management	T. OTSUKI	5.47
Public Transport Fare Policy [Railway]	S. HORIUCHI	2.92
Public Transport Fare Policy [Railway]	R. SAITO	0.50
Public Transport Fare Policy [Bus]	T. KUMAI	1.80
Interoperable Smart Card Plan	T. UMEKAWA	0.67
Smart Card Data Management and Utilization	N. MIZOGUCHI	0.00
Interoperable Smart Card System [Railway]	T. FUKATSU	3.33
Interoperable Smart Card System [Bus]1	A. TANAKA	2.60
Interoperable Smart Card System [Bus]2	H. MIYAHARA	2.00
Communication System	K. HONDA	2.50
Fare Management System [AFC Technical Specification]	H. KUWANO	0.57

Fare Management System [AFC Technical Specification]	Y. WATABE	4.40
Fare Management system [AFC Host System]	Y. SAKAMOTO	0.50
Organization Institution	A. SAKUMA	1.07
Monitoring/ Training in Japan/ Coordination	M. OHNO	2.60
TOTAL PMs		36.40 (66.2%)
Planned PMs		55.00

## 1.2 Progress of Activities

### 1.2.1 Joint Coordinating Committee and Working Group Meetings

Three Joint Coordinating Committee (JCC) meeting and several working group (WG) meetings were held during the period.

**Table 2: Joint Coordinating Committee and Working Group Meetings**

Meetings Conducted	Participated Agency	Key Agenda	Date
First JCC meeting	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Outline of Work Plan (Draft) 2) Confirmation of the Undertakings by Vietnamese Side	2 February 2018
Second JCC Meeting	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Progress of the project 2) Proposal from WG 3) Items to be confirmed by Hanoi-city 4) Activity plans	22 August 2018
Third JCC Meeting	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Achievements in the 1st Year 2) Explanation for Outline of 'Design Guideline and Specifications 'and Fare Policy 3) Activities in Next Period	7 November 2018

Meetings Conducted	Participated Agency	Key Agenda	Date
1st WG Leader Meeting	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Ideal AFC Model in Hanoi 2) Confirmation of 2nd JCC	23 August 2018
2nd WG Leader Meeting	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Progress of the project since last JCC meeting 2) Response to the notice by HPC 3) Confirmation of the materials and preparations for the seminar	4 December 2018
3rd WG Leader Meeting	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Reflection of the seminar for the formulation of Outline Report 2) Site Visit at TRAMOC (Bus Operator) Demo for Bus unit	6 December 2018

Meetings Conducted	Participated Agency	Key Agenda	Date
1st Seminar	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	Project Overview and Introduction of Basic Approach on Interoperable Smart Card System for Public Transportation in Hanoi	5 December 2018

**Table 3: Working Group 1 Meetings**

No.	Date	Subject
1	16th Apr, 2018	<ul style="list-style-type: none"> <li>Outline of the expected output of WG1</li> <li>Confirmation of the activity schedule</li> </ul>
2	29rd May, 2018	<ul style="list-style-type: none"> <li>Explanation of the Fare Management System in Japan</li> </ul>
3	30th May, 2018	<ul style="list-style-type: none"> <li>Discussion on the feasibility to install each system into Hanoi</li> </ul>
4	5th Jun, 2018	<ul style="list-style-type: none"> <li>Explanation of the Fare Management System in other countries</li> </ul>
5	25th Jul, 2018	<ul style="list-style-type: none"> <li>Clarification of the items to be discussed</li> <li>Discussion on the reporting to the 2nd JCC</li> </ul>
6	19th Sep, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents of outline report</li> </ul>
7	20th Sep, 2018	<ul style="list-style-type: none"> <li>Explanation of transfer discount in other countries</li> </ul>
8	28th Nov, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents of seminar</li> <li>Confirmation of items to be discussed in the upcoming WG1</li> </ul>
9	7th Dec, 2018	<ul style="list-style-type: none"> <li>Confirmation of distance-based fare</li> <li>Discussion on ticket type</li> </ul>
10	14th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion on the way of transfer discount</li> </ul>
11	17th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion on ticket types and information on card surface</li> </ul>
12	22nd Jan, 2019	<ul style="list-style-type: none"> <li>Confirmation of the result of discussion and table of contents of the output</li> </ul>
13	26th Feb, 2019	<ul style="list-style-type: none"> <li>Confirmation of contents of fare system guideline (proposed)</li> </ul>
14	14th Mar, 2019	<ul style="list-style-type: none"> <li>Confirmation of the comment from Vietnamese side against fare system guideline (proposed)</li> </ul>
15	20th Mar, 2019	<ul style="list-style-type: none"> <li>Reconfirmation of the whole structure of outputs in line with the work plan</li> <li>Confirmation of the tasks from April</li> </ul>
16	25th Mar, 2019	<ul style="list-style-type: none"> <li>Confirmation of the response toward the comments from Vietnamese side against fare system guideline (proposed)</li> </ul>
17	13rd Jun, 2019	<ul style="list-style-type: none"> <li>Discussion on how to deal with fare system guideline</li> </ul>
18	18th Jun, 2019	<ul style="list-style-type: none"> <li>Leader meeting with Mr. Binh (vice director of TRAMOC)</li> </ul>
19	16th Jul, 2019	<ul style="list-style-type: none"> <li>Discussion on how to deal with fare system guideline</li> </ul>

**Table 4: Working Group 2 Meetings**

No.	Date	Subject
1	12th Apr, 2018	<ul style="list-style-type: none"> <li>Procedure on WG2 activities "Development of Operational Specification"</li> <li>Explanation of the draft proposal of the list of Operational Specification</li> <li>Outline of the expected final output of WG2</li> <li>Confirmation of the activity schedule</li> </ul>
2	13rd Apr, 2018	<ul style="list-style-type: none"> <li>Outline of the expected final output of the Operational Specification</li> <li>Confirmation of the activity schedule</li> </ul>
3	30th May, 2018	<ul style="list-style-type: none"> <li>Explanation of the draft proposal of the list of Operational Specification</li> <li>Re-issue and re-issue registration (Assignment)</li> <li>Card life cycle</li> </ul>

4	31st May, 2018	• Boarding and Alighting from railway, BRT and bus
5	21st June, 2018	• Discussion on the Operational Specification
6	5th July, 2018	• Interview about operation of railway, BRT and bus
7	21st Aug, 2018	• Confirmation of the contents of outline report
8	6th Nov, 2018	• Discussion on the operational flow in the use of interoperable IC card
9	8th Nov, 2018	• Discussion on the operational flow in the use of interoperable IC card
10	4th Dec, 2018	• Discussion on the operational flow in the use of interoperable IC card
11	18th Dec, 2018	• Discussion on the operational flow in the use of interoperable IC card
12	22nd Jan, 2019	• Discussion on the operational flow in the use of interoperable IC card
13	24th Jan, 2019	• Discussion on the operational flow in the use of interoperable IC card
14	26th Mar, 2019	• Discussion on the operational flow in the use of interoperable IC card
15	29th May, 2019	• Discussion on the operational flow in the use of interoperable IC card
16	26th Jun, 2019	• Discussion on the operational flow in the use of interoperable IC card
17	24th Jul, 2019	• Discussion on the operational flow in the use of interoperable IC card

**Table 5: Working Group 3 Meetings**

No.	Date	Subject
1	12th Apr, 2018	• Discussion on WG3 activity planning
2	13rd Apr, 2018	<ul style="list-style-type: none"> <li>➢ Confirmation on WBS, operation plan</li> <li>➢ Sharing the target deliverables of WG3 (AFC technical specification)</li> <li>➢ Review on AFC system interoperable use</li> </ul> <ul style="list-style-type: none"> <li>• Lecture for understanding of AFC system, basic terms and structure</li> <li>• Review and discussion on Hanoi AFC technical framework (3978) from interoperable perspective.</li> </ul>
3	21st May, 2018	<ul style="list-style-type: none"> <li>• Explanation of AFC survey report on public transportation interoperability in Hanoi City. (BRT, Line2A, Line3, laws and regulations)</li> <li>• Review on overview on AFC technical specification and IC card issuance process</li> <li>• Procedure on WG3 activities and planning for upcoming 3 months</li> </ul>
4	22nd May, 2018	• Understanding of AFC technical specification
5	23rd May, 2018	➢ Explanation and discussion on each AFC technical specification item.
6	24th May, 2018	(ticket media, R/W, Smartcard IC format, encoding process/format,
7	25th May, 2018	common code, ticket validation, transaction data and set value, black list,
8	28rd May, 2018	trip pattern, host system)
9	29th May, 2018	
10	30th May, 2018	
11	8th June, 2018	
12	4th June, 2018	• Review of proposal of FMC by TRAMOC (2015):
13	11th June, 2018	• Clarification key points of AFC interoperable technical specification for Hanoi
14	13rd June, 2018	➢ Acquire the important key point for AFC technical specification to be
15	15th June, 2018	introduced in Hanoi city
16	26th June, 2018	➢ Listing up the discussion items with other WGs.
17	27th June, 2018	
18	29th June, 2018	
19	4th July, 2018	
20	27th June, 2018	• MKsmartfactory visit for IC card manufacturing tour and study on interoperable bus R/W.

PM Form 3-1 Monitoring Sheet Summary

21	19th July, 2018	<ul style="list-style-type: none"> <li>Review of Drafted outline of AFC technical specification.</li> <li>➤ Create and review draft version of outline of AFC technical specification.</li> </ul>
22	23rd July, 2018	
23	24th July, 2018	
24	31st July, 2018	
25	24th July, 2018	<ul style="list-style-type: none"> <li>Review BRT AFC document from Viettel</li> <li>On site review of demonstration of AFC system for pilot test and confirmation of technical details with Transerco-Viettel BRT project members</li> <li>Review on summary of main point discussed and Study of coping plan</li> <li>Joint meeting with WG1, WG2 and WG4 to shaping consensus on main point discussed proposed by WG3</li> </ul>
26	27th July, 2018	
27	8th Aug, 2018	
28	10th Aug, 2018	
29	14th Aug, 2018	
30	16th Aug, 2018	
31	21st Aug, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents to be reported in JCC (Discussion on role sharing in formulation of the technical specifications)</li> </ul>
32	24th Aug, 2018	<ul style="list-style-type: none"> <li>Discussion on host system specifications</li> </ul>
33	7th Sep, 2018	<ul style="list-style-type: none"> <li>Discussion on contents and sharing of work between Japanese and Vietnamese sides in formulation of the technical specifications (common code)</li> </ul>
34	5th Nov, 2018	<ul style="list-style-type: none"> <li>Site visit at depots of three local bus companies*. Investigation was conducted in terms of infrastructure related to system and network and amount of data to be dealt with at each depot, for the purpose of establishment of AFC system suitable for the actual bus operation.</li> <li>*Nam Ha Noi Bus company, Cau Buou bus company (142 bus, 11 line), Tan Dat bus company (68 bus, 5 line)</li> </ul>
35	6th Nov, 2018	<ul style="list-style-type: none"> <li>Confirmation of contents of JCC meeting</li> <li>Discussion on technical specifications (proposed common code)</li> </ul>
36	8th Nov, 2018	
37	9th Nov, 2018	<ul style="list-style-type: none"> <li>Site visit at Line 2A. Inspection of installed AFC facility, IC card and operation, and investigation for tasks to be tackled for formulation of common specifications are conducted.</li> <li>Survey of actual AFC trial operation in BRT</li> </ul>
38	28th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on specifications for common code, which is used to process data in interoperable use</li> </ul>
39	7th Nov, 2018	<ul style="list-style-type: none"> <li>Technical Specifications (discussion on encode format)</li> </ul>
40	17th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
41	19th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
42	21st Dec, 2018	<ul style="list-style-type: none"> <li>Technical Specifications (discussion on encode format)</li> </ul>
43	25th Dec, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
44	11th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (common code, format)</li> </ul>
45	16th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (reader/writer)</li> </ul>
46	17th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (encode process)</li> </ul>
47	22nd Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (trip pattern)</li> </ul>
48	24th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (host system)</li> </ul>
49	19th Feb, 2019	<ul style="list-style-type: none"> <li>Discussion on installation of IC card in buses with TRANSERCO</li> </ul>
50	20th Feb, 2019	<ul style="list-style-type: none"> <li>Discussion on work plan and role sharing in 2019</li> <li>Sharing opinion with Mr. Hai (director of TRAMOC) about how to move WG3 forward</li> <li>Confirmation of list of tasks and role sharing in formulation of technical specifications</li> </ul>

51	21st Jan, 2019	<ul style="list-style-type: none"> <li>• Interview with NAPAS about how to apply IC card to other transport</li> <li>• Discussion with Ms. Huong on tasks and solutions in the process of project</li> </ul>
52	17th Apr, 2019	<ul style="list-style-type: none"> <li>• Site visit at Payoo Corporation to survey the situation of Fintech, which is used for ABT system</li> <li>• Site visit at pilot trial at Ho Chi Minh bus, in which ABT system is installed (create an account of ZaloPay, apply for UniPass, issue IC card, take a bus)</li> <li>• Sharing opinion with iTD Company, one of the most promising IT company in Vietnam, about ABT and CBT in the structure of AFC system</li> </ul>
53	19th Apr, 2019	<ul style="list-style-type: none"> <li>• Discussion with Vietnamese members about the main text of technical specifications <ul style="list-style-type: none"> <li>➢ Confirmation of progress in outline (to be tackled after conclusion of HPC meeting)</li> </ul> </li> </ul>
54	22nd Apr, 2019	<ul style="list-style-type: none"> <li>• Discussion with Vietnamese members about the main text of technical specifications <ul style="list-style-type: none"> <li>➢ Confirmation of items, schedule and role sharing</li> <li>➢ Vietnamese side raised a problem in lack of resources to be used to contents confirmation</li> </ul> </li> </ul>
55	24th Apr, 2019	<ul style="list-style-type: none"> <li>• Sharing opinion with R&amp;D sector, NAPAS</li> </ul>
56	28th May, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for common code</li> </ul>
57	30th May, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for common code</li> </ul>
58	4th – 21st Jun, 2019 (every Tue and Thu)	<ul style="list-style-type: none"> <li>• Detailed review of specifications for common code</li> </ul>
59	2nd – 25th Jul, 2019 (every Tue and Thu, except for 16th and 18th)	<ul style="list-style-type: none"> <li>• Detailed review of specifications for common code</li> </ul>
60	31st Jul, 2019	<ul style="list-style-type: none"> <li>• Discussion on structure of common code of bus stops</li> </ul>

**Table 6: Working Group 4 Meetings**

No.	Date	Subject
1	21st Aug, 2018	<ul style="list-style-type: none"> <li>• Confirmation of contents of outline report</li> </ul>
2	5th Nov, 2018	<ul style="list-style-type: none"> <li>• Discussion on organizational structure and staffing requirements under FMC</li> </ul>
3	6th Dec, 2018	<ul style="list-style-type: none"> <li>• Discussion on organizational structure and staffing requirements under FMC</li> </ul>
4	19th Dec, 2018	<ul style="list-style-type: none"> <li>• Discussion on organizational structure and staffing requirements under FMC</li> </ul>
5	21st Dec, 2018	<ul style="list-style-type: none"> <li>• Discussion on contents of outline report</li> </ul>
6	23rd Jan, 2019	<ul style="list-style-type: none"> <li>• Discussion on organizational structure and staffing requirements under FMC</li> </ul>
7	27th Mar, 2019	<ul style="list-style-type: none"> <li>• Discussion on organizational structure and staffing requirements under FMC</li> </ul>
8	30th May, 2019	<ul style="list-style-type: none"> <li>• Discussion on organizational structure and staffing requirements under FMC</li> </ul>
9	27th Jun, 2019	<ul style="list-style-type: none"> <li>• Discussion on terms of reference detailing the specific tasks and responsibilities of each unit under FMC</li> </ul>
10	25th Jul, 2019	<ul style="list-style-type: none"> <li>• Discussion on terms of reference detailing the specific tasks and responsibilities of each unit under FMC</li> </ul>

**1.2.2 Output 1: ‘Design Guideline and Specifications’ for interoperable smart card system are developed.**

The progress of Output 1 activities is shown in the table below.

**Table 7: Progress of Output 1 Activities**

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system including MRT, BRT and Bus in Hanoi	Collect the legal documents related to the transportation smart card system as follows; ✓ Legal systems and standards on smart card system/ transportation smart card system ✓ Design documents of smart card system ✓ International standards for interoperable AFC system ✓ MRT 2A, 3: AFC technical design ✓ MRT 2: AFC technical specifications ✓ BRT1, Route Bus: Specifications and planning documents to introduce ✓ Hanoi City and MOT: Legal system and decision about technical standardization of AFC ✓ Central Bank: Decision, regulations, standard regarding smart card and electric money	- Done	- No activity (N/A)
1-2 Prepare an outline of ‘Design Guideline and Specifications’ and the fare policy	1) Examination of ticket specifications for interoperable use 2) Examination of fare system rules for interoperable use 3) Examination of the operational specifications 4) Examination of the technical specifications	- Done	- No activity (N/A)
1-3 Consult with the relevant authorities and finalize the concepts of the ‘Design Guideline and Specifications’ and the fare policy.	-	- Done	- No activity (N/A)
1-4 Preparation of the drafts of the ‘Design Guideline and Specifications’ and the fare policy	-	- Completed Detailed Outline	Based on the Detailed Outline, the Working Groups will continue to prepare the output.
1-5 Consult with the relevant authorities and finalize the ‘Design Guideline and	-	- On going	To be completed at last in one month before Project is ended.



Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
Specifications' and the fare policy			
1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.	-	- Under preparation and wait for permission from HPC	

**1.2.3 Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.**

The progress of Output 2 activities is shown in the table below.

**Table 8: Progress of Output 2 Activities**

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	1) Conduct a survey of relevant laws and regulations 2) Define the scope of work of the Fare Management Center (division)	- Done	- No activity (N/A)
2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).	Define the basic six items of operational terms of reference of FMC	- Completed the Draft.	- Continue discussion for final version
2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division).	-	- To be done soon.	- No activity (N/A)
2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.	1) Prepare a TOR 2) Organizational structure and staff requirements	- On going	- On going

### 1.3 Achievement of Output

#### 1.3.1 Output 1

Achievement status of Output 1 is as follows.

**Table 9: Verifiable Indicators and Current Status**

Objectively Verifiable Indicator	Baseline	Current Status
The Design Guideline and Specification is prepared.	None	On going

Source: PDM 1.1

#### 1.3.2 Output 2

Achievement status of Output 2 is as follows.

**Table 10: Verifiable Indicators and Current Status**

Objectively Verifiable Indicator	Baseline	Current Status
Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval	None	On going

Source: PDM 1.1

### 1.4 Achievement of the Project Purpose

Also stated in PDM, the achievement of the project purpose shall be evaluated using verifiable indicators.

**Table 11: Verifiable Indicators and Current Status**

Objectively verifiable indicators	Baseline	Current Status
- 'Design Guideline and Technical Specifications' are approved by HPC	None	On going
- The public transport fare policy is established	None	On going

Source: PDM 1.1

To achieve the project purpose, the JICA Project Team (JPT) identify the required knowledge and skills by each output shown in the following table. Result of the baseline survey were evaluated on a five-level scale as indicated below and illustrated in following figures.

- (1) Newbie: I don't know the process/ concept;
- (2) Novice: I know the process/ concept, but I have never done it;
- (3) Young Expert: I have done it once, but I have not reported or presented the results;
- (4) Expert: I have done it twice or more/ I have done it once and reported or presented the results;  
and
- (5) Senior Expert: I have done it twice or more, and reported or presented the results.

**Table 12 Required Knowledge and Skills per Project Output and Activity**

Expected Output	Activities	Required Knowledge & Skills
(1) The 'Design Guideline and Specification' is prepared.	1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system including MRT, BRT and Bus in Hanoi	Information collection capability, Issue solving capability
	1-2 Prepare of outline of 'Design Guideline and Specifications' and the fare policy	(1) Basic knowledge of a) Ticket specifications, b) Fare system c) Operation system d) Technical specification e) Host system  (2) Capability for development of a) Rules for common ticket b) Rules for fare c) Rules for operation specification d) Rules for technology implementing specification e) Host system specification
	1-3 Consult with the relevant authorities and finalize the concepts of the 'Design Guideline and Specifications' and the fare policy.	
	1-4 Preparation of the drafts of the 'Design Guideline and Specifications' and the fare policy	
	1-5 Consult with the relevant authorities and finalize the 'Design Guideline and Specifications' and the fare policy	
	1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.	
(2) Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval	2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	(1) Information collection capability (2) Issue solving capability
	2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).	(1) Basic knowledge of the scope of works (functions) (2) Capability for development of the scope of work(function)
	2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division).	(1) Basic knowledge of work description (2) Capability for development of work description
	2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including	(1) Basic knowledge of a) Operational terms of reference b) Terms of reference for staffing

Expected Output	Activities	Required Knowledge & Skills
	organizational structure and staffing requirements.	(2) Capability for development of rules for operation and management of Fare Management Center

The first baseline survey was conducted in xxx 2018 to measure the current knowledge and skills level. The average scores are shown in the following table and each scores are in the following figures.

**Table 13 Average Scores per Outputs**

Survey	Output	
	1	2
Baseline Survey (xxx 2018)		

**1.5 Changes of Risks and Actions for Mitigation**

**1.6 Progress of Actions undertaken by JICA**

**1.7 Progress of Actions undertaken by The People’s Committee of Hanoi**

**1.8 Progress of Environmental and Social Considerations (if applicable)**

**1.9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)**

**1.10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)**

Project is implemented in the context of many movements/fluctuations. Such as Line 2A, Line 3 in the completion process, pilot smart card on BRT Line... Especially, Hanoi started to develop a smart city... They create new several requirements for Project.

**1.11 Tasks to be implemented by JICA Project Team and Counterparts**

Work	Tasks	Implementing agencies
Output 1: 'Design Guideline and Specifications' for interoperable smart card system are developed		

Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.		

**2 Delay of Work Schedule and/or Problems (if any)**

**2.1 Detail**

**2.2 Cause**

**First Reason: Working time of Working Groups is affected due to the delay of Working Groups Establishment**

Working Groups were proposed to be established very soon in February 2018 as agreed by both sides at the 1st JCC Meeting on 02/02/2018, however, after almost 2 months of delay, finally Working groups were established on 29/3/2018 by the Decision No. 341/QD-SGTVT dated 29 March 2018. During the implementation, Vietnamese member list was revised once by the Decision No. 920/QD-SGTVT dated 4 June 2018.

**Second Reason: Approval on Detailed Outline was delayed due to time consuming for Consideration on ABT technology issue**

Detailed Outline of Design Guideline and Technical Specifications was prepared based on CBT technology according to Decision 3978/QD-UBND and it was submitted to get approval since 17 Jan 2019 for approval. Meanwhile, in order to develop Smart city, Hanoi city has been considering whether ABT technology is applied or not. After Hanoi city gave conclusion about this issue based on discussions with Project Expert Team about the comparison between ABT technology and CBT technology, Detailed Outline was officially approved in 26/04/2019, which took about 3 months since its submission.

During waiting-for-approval- period, Working Groups did not entirely stop their activities, but they could not work sufficiently because they could only discuss what contents not affected by approval results

**Third reason: Time consuming for consulting with authorized organizations and complete Outputs**

Consulting with authorized organizations and complete "Design Guideline and Technical Specifications", "Fare Policy" and "Terms of Reference of FMC" are our planned activities. However, from practical experiences, as above mentioned, this task lasts relatively long time, especially Project Outputs are highly technical and/or quite sensitive in terms of organization. Therefore, Vietnamese side tends to take more time than planned to review, study, give comments.

### **2.3 Action to be taken**

Due to above mentioned delays, in order to achieve the outputs as planned, it is considered to be necessary to extend the Project implementation duration.

Project extension will help Working Group members and Project Expert Team to have enough valuable time for technology transfer at necessary level and to ensure its sustainability.

Our project proposes to extend 5 months, in which, all working items will be completed until the end of April 2020 and the final month, May 2020 is used for project completion tasks and hand-over.

As above mentioned, besides implementing working items of approved Work Plan, the amount of work for extension period until the end of April 2020 is summarized as follows:

- a. To complete technology transfer at necessary level to ensure the sustainability.
- b. To consult authorized organizations and complete "Design Guideline and Technical Specifications"
- c. To Finalize Report Contents, Prepare and Submit Reports

### **2.4 Roles of Responsible Persons/Organization (JICA, The People's Committee of Hanoi, etc.)**

## **3 Modification of the Project Implementation Plan**

### **3.1 PO**

### **3.2 Other modifications on detailed implementation plan**

## **II. Project Monitoring Sheet I & II** *as Attached*

**Project Monitoring Sheet I (Project Design Matrix)**

**Version 3**

**Project title:** Project for Supporting Development of Interoperable Smart Card System for Public Transportation in Hanoi

**Dated. 28 August. 2019**

**Project Area:** Hanoi

**Target Group:** Hanoi People's Committee (HPC) and organizations related to public transportation in Hanoi

**Counterpart:** HPC (Hanoi Department of Transport (DOT), Hanoi Department of Science and Technology (DOST), Hanoi Department of Information and Communication (DOIC), Hanoi Metro Company (HMC), Hanoi Transport Corporation (TRANSERCO))

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption	Achievement	Remarks
<b>Overall Goal</b>					
Interoperable smart card systems are developed for the public transportation in Hanoi	<ul style="list-style-type: none"> <li>Number of public transport operators applying the 'Design Guideline and Specifications' developed under the Project to realize interoperable smart card system.</li> <li>Ratio of satisfaction on interoperable smart card is more than XX%.</li> </ul>	Survey report(s)			
<b>Project Purpose</b>					
Technical and management capacities of counterpart agencies under HPC are improved for the development of interoperable smart card system for public transportation in Hanoi	<ul style="list-style-type: none"> <li>'Design Guideline and Specifications' are approved by HPC.</li> <li>The public transport fare policy is established.</li> </ul>	<ul style="list-style-type: none"> <li>Approved 'Design Guideline and Specifications'</li> <li>Project progress report</li> </ul>	Decision no. 3978/QD-UBND dated 13 August 2015 on use of interoperable smart card in public transportation in Hanoi continues to be effective.		
<b>Outputs</b>					
1. 'Design Guideline and Specifications' for interoperable smart card system are developed.	'Design Guideline and Specifications' are finalized.	'Design Guideline and Specifications' (final version)	HPC reviews policy/ documents developed under the Project in a timely manner.		
2. Organization terms of reference of each unit of the Fare Management Center (Division) are developed.	Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval.	Organizational terms of reference for the Fare Management Center (Division) (draft for approval)			

Activities	Input		Pre-conditions
	Japanese Side	Vietnamese Side	
1-1. Collect and analyze information on the existing and approved smart card systems for the public transportation system in Hanoi	1. Japanese Experts - Leader - Public Transport Fare Policy and System - Interoperable Smart Card System - Communication System - Fare Management System	1. Project Counterparts (1) HPC (2) HDOT - Road Transportation Management Division - Planning and Investment Division - Economics planning Division - TRAMOC (3) DOST (4) DOIC (5) HMC (6) TRANSERCO 2. Provision of Office Space and equipment 3. Cost for - counterpart members - office operation and maintenance - others (local travel expenses excluding airfare for Vietnamese side, etc.)	Official request to apply for Japan's ODA Loan Project.
1-2. Prepare an outline of 'Design Guideline and Specifications' and fare policy	2. Counterpart Training in Japan		
1) Examination of fare ticket specifications for interoperable use 2) Examination of fare system rules for interoperable use 3) Examination of the operation rules 4) Examination of the technical specifications	3. Seminar and workshop		
1-3. Consult with the relevant authorities and finalize the outline of the 'Design Guideline and Specifications' and fare policy	4. Other cost - Local experts and consultants - Local staff - Others (survey, card rental, etc.)		
1-4. Draft a 'Design Guideline and Specifications' with fare policy			
1-5. Consult with the relevant authorities and finalize the 'Design Guideline and Specifications'			
1-6. Conduct seminar(s) to introduce the draft 'Design Guideline Specifications' and fare policy			
2-1. Define the scope of work to be performed by the proposed Fare Management Center (Division)			
1) Conduct a survey of relevant laws and regulations 2) Define the scope of work of the fare management center (division)			
2-2. Define the tasks and responsibilities of departments/division under the Fare Management Center (Division)			
2-3. Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division)			
2-4. Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.			
1) Prepare a TOR 2) Organizational structure and staff requirements			





## PROJECT MONITORING SHEET

**Project Title:** The Project for Supporting Development of Interoperable Smart Card System for Public Transport in Hanoi

**Version of the Sheet:** Ver. 5 (Term: 2017 - 2020)

**Name:** Mr. Michimasa TAKAGI

**Title:** Team Leader/ Urban Public Transport

**Submission Date:** December 2019

### I. Summary

#### 1 Progress

This monitoring sheet covers the period from project commencement in **December 2017** up to **the end of November 2019**.

#### 1.1 Progress of Inputs

##### 1.1.1 Experts

**Table 1: Input of Experts as of End-July**

Designation	Name	No. of PMs
Team Leader/ Urban Public Transport	M. TAKAGI	5.73
Deputy Team Leader/ AFC Technical Management	T. OTSUKI	6.30
Public Transport Fare Policy [Railway]	S. HORIUCHI	2.92
Public Transport Fare Policy [Railway]	R. SAITO	1.47
Public Transport Fare Policy [Bus]	T. KUMAI	2.03
Interoperable Smart Card Plan	T. UMEKAWA	0.83
Smart Card Data Management and Utilization	N. MIZOGUCHI	0.00
Interoperable Smart Card System [Railway]	T. FUKATSU	3.87
Interoperable Smart Card System [Bus]1	A. TANAKA	2.87
Interoperable Smart Card System [Bus]2	H. MIYAHARA	2.63
Communication System	K. HONDA	3.00
Fare Management System [AFC Technical Specification]	H. KUWANO	0.57

Fare Management System [AFC Technical Specification]	Y. WATABE	4.93
Fare Management system [AFC Host System]	Y. SAKAMOTO	1.00
Organization Institution	A. SAKUMA	1.30
Monitoring/ Training in Japan/ Coordination	M. OHNO	3.87
TOTAL PMs		41.85 (73.3%)
Planned PMs		57.10

## 1.2 Progress of Activities

### 1.2.1 Joint Coordinating Committee and Working Group Meetings

Four Joint Coordinating Committee (JCC) meetings and several working group (WG) meetings were held during the period.

**Table 2: Joint Coordinating Committee and Working Group Meetings**

#### Joint Coordination Committee Meeting

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
1	First JCC meeting	2 February 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	<ol style="list-style-type: none"> <li>1) Outline of Work Plan (Draft)</li> <li>2) Confirmation of the Undertakings by Vietnamese Side</li> </ol>
2	Second JCC Meeting	22 August 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	<ol style="list-style-type: none"> <li>1) Progress of the project</li> <li>2) Proposal from WG</li> <li>3) Items to be confirmed by Hanoi-city</li> <li>4) Activity plans</li> </ol>
3	Third JCC Meeting	7 November 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	<ol style="list-style-type: none"> <li>1) Achievements in the 1st Year</li> <li>2) Explanation for Outline of 'Design Guideline and Specifications 'and Fare Policy</li> <li>3) Activities in Next Period</li> </ol>
4	Fourth JCC Meeting	29 August 2019	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	<ol style="list-style-type: none"> <li>1) Report about Project Implementation</li> <li>2) Remaining Items</li> <li>3) Plan/Procedure to obtain appraisal, approval on Design Guidelines and Technical Specifications</li> <li>4) Proposal on AFC system implementation under the city bus network (applying Project outputs)</li> <li>5) Proposal about Project extension</li> </ol>

#### Meeting among WGs/Meeting with Originations

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
1	1st WG Leader Meeting	23 August 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	<ol style="list-style-type: none"> <li>1) Ideal AFC Model in Hanoi</li> <li>2) Confirmation of 2nd JCC</li> </ol>

PM Form 3-1 Monitoring Sheet Summary

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
2	2nd WG Leader Meeting	4 December 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Progress of the project since last JCC meeting 2) Response to the notice by HPC 3) Confirmation of the materials and preparations for the seminar
3	3rd WG Leader Meeting	6 December 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Reflection of the seminar for the formulation of Outline Report 2) Site Visit at TRAMOC (Bus Operator) Demo for Bus unit
4	JICA-JET meeting for the fourth JCC meeting	23 August 2019	JICA Headquarters, JICA Viet Nam Office, JICA Expert Team	1) Topics and materials in JCC meeting
5	Inter-Working Group Meeting	29 August 2019	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Transfer discount 2) Valid period of season passes
6	Inter-Working Group Meeting (JET only)	3 October 2019	JICA Expert Team	1) Confirmation of draft DG/TS
7	Inter-Working Group Meeting	3 October 2019	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Confirmation of remaining items
8	Orientation Meeting	4 October 2019	JICA Headquarters, JICA Viet Nam Office, JICA Expert Team	1) Confirmation on how to develop outputs and schedule
9	General Meeting with JICA	7th October 2019	JICA Headquarters, JICA Expert Team	1) Contents of outputs and the seminar
10	Inter-Working Group Meeting (JET only)	27th November 2019	JICA Expert Team	1) Review of the seminar and orientation
11	Meeting with HDOT	29th November 2019	HDOT, JICA Expert Team	1) Schedule of the project

Seminar

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
1	1st Seminar	5 December 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Project Overview and Introduction of Basic Approach on Interoperable Smart Card System for Public Transportation in Hanoi
2	2nd Seminar	27th November 2019	HDOT, HDOF, HDOST, HDOIC, SBV, HMC, TRANSERCO, MOT, TRAMOC. Construction Association, BIDV, IT Agribank, Vietcombank, Viettel, MK Group, ITD, VNPT, NAPAS, ADB, WB,	1) Overview of the draft DG/TS

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
			ABeam Consulting (Vietnam), Viet Nam Tokyo Metro, TOPPAN FORMS, Sony Imaging Products & Solutions, Sony Electronics Vietnam, JCB International	

### Working Group 1 Meeting

No.	Date	Subject
1	16th Apr, 2018	<ul style="list-style-type: none"> <li>Outline of the expected output of WG1</li> <li>Confirmation of the activity schedule</li> </ul>
2	29rd May, 2018	<ul style="list-style-type: none"> <li>Explanation of the Fare Management System in Japan</li> <li>Discussion on the feasibility to install each system into Hanoi</li> </ul>
3	30th May, 2018	
4	5th Jun, 2018	<ul style="list-style-type: none"> <li>Explanation of the Fare Management System in other countries</li> </ul>
5	25th Jul, 2018	<ul style="list-style-type: none"> <li>Clarification of the items to be discussed</li> <li>Discussion on the reporting to the 2nd JCC</li> </ul>
6	19th Sep, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents of outline report</li> </ul>
7	20th Sep, 2018	<ul style="list-style-type: none"> <li>Explanation of transfer discount in other countries</li> </ul>
8	28th Nov, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents of seminar</li> <li>Confirmation of items to be discussed in the upcoming WG1</li> </ul>
9	7th Dec, 2018	<ul style="list-style-type: none"> <li>Confirmation of distance-based fare</li> <li>Discussion on ticket type</li> </ul>
10	14th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion on the way of transfer discount</li> </ul>
11	17th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion on ticket types and information on card surface</li> </ul>
12	22nd Jan, 2019	<ul style="list-style-type: none"> <li>Confirmation of the result of discussion and table of contents of the output</li> </ul>
13	26th Feb, 2019	<ul style="list-style-type: none"> <li>Confirmation of contents of fare system guideline (proposed)</li> </ul>
14	14th Mar, 2019	<ul style="list-style-type: none"> <li>Confirmation of the comment from Vietnamese side against fare system guideline (proposed)</li> </ul>
15	20th Mar, 2019	<ul style="list-style-type: none"> <li>Reconfirmation of the whole structure of outputs in line with the work plan</li> <li>Confirmation of the tasks from April</li> </ul>
16	25th Mar, 2019	<ul style="list-style-type: none"> <li>Confirmation of the response toward the comments from Vietnamese side against dare system guideline (proposed)</li> </ul>
17	13rd Jun, 2019	<ul style="list-style-type: none"> <li>Discussion on how to deal with fare system guideline</li> </ul>
18	18th Jun, 2019	<ul style="list-style-type: none"> <li>Leader meeting with Mr. Binh (vice director of TRAMOC)</li> </ul>
19	16th Jul, 2019	<ul style="list-style-type: none"> <li>Discussion on how to deal with fare system guideline</li> </ul>
20	23rd Aug, 2019	<ul style="list-style-type: none"> <li>Discussion on how to deal with fare system guideline</li> </ul>
21	4th Oct, 2019	<ul style="list-style-type: none"> <li>Discussion and Confirmation on draft technical cooperation outputs</li> </ul>
22	24th Oct, 2019	<ul style="list-style-type: none"> <li>Confirmation on outputs with WG3 (JICA Expert Team only)</li> </ul>
23	31st Oct, 2019	<ul style="list-style-type: none"> <li>Arrangement and material of the seminar (JICA Expert Team only)</li> </ul>
24	25th Nov, 2019	<ul style="list-style-type: none"> <li>Discussion on contents of the seminar</li> </ul>

### Working Group 2 Meeting

No.	Date	Subject
1	12th Apr, 2018	<ul style="list-style-type: none"> <li>Procedure on WG2 activities "Development of Operational Specification"</li> </ul>

No.	Date	Subject
		<ul style="list-style-type: none"> <li>• Explanation of the draft proposal of the list of Operational Specification</li> <li>• Outline of the expected final output of WG2</li> <li>• Confirmation of the activity schedule</li> </ul>
2	13rd Apr, 2018	<ul style="list-style-type: none"> <li>• Outline of the expected final output of the Operational Specification</li> <li>• Confirmation of the activity schedule</li> </ul>
3	30th May, 2018	<ul style="list-style-type: none"> <li>• Explanation of the draft proposal of the list of Operational Specification</li> <li>• Re-issue and re-issue registration (Assignment)</li> <li>• Card life cycle</li> </ul>
4	31st May, 2018	<ul style="list-style-type: none"> <li>• Boarding and Alighting from railway, BRT and bus</li> </ul>
5	21st June, 2018	<ul style="list-style-type: none"> <li>• Discussion on the Operational Specification</li> </ul>
6	5th July, 2018	<ul style="list-style-type: none"> <li>• Interview about operation of railway, BRT and bus</li> </ul>
7	21st Aug, 2018	<ul style="list-style-type: none"> <li>• Confirmation of the contents of outline report</li> </ul>
8	6th Nov, 2018	<ul style="list-style-type: none"> <li>• Discussion on the operational flow in the use of interoperable IC card</li> </ul>
9	8th Nov, 2018	<ul style="list-style-type: none"> <li>• Discussion on the operational flow in the use of interoperable IC card</li> </ul>
10	4th Dec, 2018	<ul style="list-style-type: none"> <li>• Discussion on the operational flow in the use of interoperable IC card</li> </ul>
11	18th Dec, 2018	<ul style="list-style-type: none"> <li>• Discussion on the operational flow in the use of interoperable IC card</li> </ul>
12	22nd Jan, 2019	<ul style="list-style-type: none"> <li>• Discussion on the operational flow in the use of interoperable IC card</li> </ul>
13	24th Jan, 2019	<ul style="list-style-type: none"> <li>• Discussion on the operational flow in the use of interoperable IC card</li> </ul>
14	26th Mar, 2019	<ul style="list-style-type: none"> <li>• Discussion on the operational flow in the use of interoperable IC card</li> </ul>
15	29th May, 2019	<ul style="list-style-type: none"> <li>• Discussion on the operational flow in the use of interoperable IC card</li> </ul>
16	26th Jun, 2019	<ul style="list-style-type: none"> <li>• Discussion on the operational flow in the use of interoperable IC card</li> </ul>
17	24th Jul, 2019	<ul style="list-style-type: none"> <li>• Discussion on the operational flow in the use of interoperable IC card</li> </ul>
18	28th Aug, 2019	<ul style="list-style-type: none"> <li>• Discussion on the operational flow in the use of interoperable IC card</li> </ul>
19	30th Oct, 2019	<ul style="list-style-type: none"> <li>• Discussion on the DG/TS regarding the use of interoperable IC card</li> </ul>
20	31st Oct, 2019	<ul style="list-style-type: none"> <li>• Discussion on the DG/TS regarding the use of interoperable IC card</li> </ul>
21	26th Nov, 2019	<ul style="list-style-type: none"> <li>• Discussion on contents of the seminar</li> </ul>
22	19th Dec, 2019	<ul style="list-style-type: none"> <li>• Discussion on the fare deduction method</li> </ul>

### Working Group 3 Meeting

No	Date	Subject
1	12th Apr, 2018	<ul style="list-style-type: none"> <li>• Discussion on WG3 activity planning <ul style="list-style-type: none"> <li>➢ Confirmation on WBS, operation plan</li> <li>➢ Sharing the target deliverables of WG3 (AFC technical specification)</li> <li>➢ Review on AFC system interoperable use</li> </ul> </li> </ul>
2	13th Apr, 2018	<ul style="list-style-type: none"> <li>• Lecture for understanding of AFC system, basic terms and structure</li> <li>• Review and discussion on Hanoi AFC technical framework (3978) from interoperable perspective.</li> </ul>
3	21st May, 2018	<ul style="list-style-type: none"> <li>• Explanation of AFC survey report on public transportation interoperability in Hanoi City. (BRT, Line2A, Line3, laws and regulations)</li> <li>• Review on overview on AFC technical specification and IC card issuance process</li> <li>• Procedure on WG3 activities and planning for upcoming 3 months</li> </ul>
4	22nd May, 2018	<ul style="list-style-type: none"> <li>• Understanding of AFC technical specification</li> </ul>
5	23rd May, 2018	

No	Date	Subject
6	24th May, 2018	<ul style="list-style-type: none"> <li>➢ Explanation and discussion on each AFC technical specification item. (ticket media, R/W, Smartcard IC format, encoding process/format, common code, ticket validation, transaction data and set value, black list, trip pattern, host system)</li> </ul>
7	25th May, 2018	
8	28th May, 2018	
9	29th May, 2018	
10	30th May, 2018	
11	4th June, 2018	<ul style="list-style-type: none"> <li>• Review of proposal of FMC by TRAMOC (2015):</li> </ul>
12	8th June, 2018	<ul style="list-style-type: none"> <li>• Framework of Technical Specification for Host System</li> </ul>
13	11th June, 2018	<ul style="list-style-type: none"> <li>• Clarification key points of AFC interoperable technical specification for Hanoi <ul style="list-style-type: none"> <li>➢ Acquire the important key point for AFC technical specification to be introduced in Hanoi city</li> <li>➢ Listing up the discussion items with other WGs.</li> </ul> </li> </ul>
14	13th June, 2018	
15	15th June, 2018	
16	19th June, 2018	
17	26th June, 2018	
18	27th June, 2018	
19	29th June, 2018	
20	4th July, 2018	
21	27th June, 2018	<ul style="list-style-type: none"> <li>• MK smart factory visit for IC card manufacturing tour and study on interoperable bus R/W.</li> </ul>
22	19th July, 2018	<ul style="list-style-type: none"> <li>• Review of Drafted outline of AFC technical specification. <ul style="list-style-type: none"> <li>➢ Create and review draft version of outline of AFC technical specification.</li> </ul> </li> </ul>
23	23rd July, 2018	
24	23rd July, 2018	<ul style="list-style-type: none"> <li>• Visit to HMC <ul style="list-style-type: none"> <li>➢ Technical Information of Line 2A</li> <li>➢ Communication with HMC</li> </ul> </li> </ul>
25	24th July, 2018	<ul style="list-style-type: none"> <li>• Review of Drafted outline of AFC technical specification.</li> </ul>
26	31st July, 2018	<ul style="list-style-type: none"> <li>• Review of BRT document from Viettel (rev3.2)</li> </ul>
27	31st July, 2018	<ul style="list-style-type: none"> <li>• Review Host system of Drafted outlines of Technical Specification (ver. 0.12)</li> </ul>
28	24th July, 2018	<ul style="list-style-type: none"> <li>• Review BRT AFC document from Viettel</li> <li>• On site review of demonstration of AFC system for pilot test and confirmation of technical details with Transerco-Viettel BRT project members</li> <li>• Review on summary of main point discussed and Study of coping plan</li> <li>• Joint meeting with WG1, WG2 and WG4 to shaping consensus on main point discussed proposed by WG3</li> </ul>
29	27th July, 2018	
30	8th Aug, 2018	
31	10th Aug, 2018	
32	14th Aug, 2018	
33	16th Aug, 2018	
34	21st Aug, 2018	<ul style="list-style-type: none"> <li>• Confirmation of the contents to be reported in JCC (Discussion on role sharing in formulation of the technical specifications)</li> </ul>
35	24th Aug, 2018	<ul style="list-style-type: none"> <li>• Discussion on host system specifications</li> </ul>
36	7th Sep, 2018	<ul style="list-style-type: none"> <li>• Discussion on contents and sharing of work between Japanese and Vietnamese sides in formulation of the technical specifications (common code)</li> </ul>
37	3rd Oct, 2018	<ul style="list-style-type: none"> <li>• Discussion on common code</li> </ul>
38	5th Oct, 2018	<ul style="list-style-type: none"> <li>• Discussion on common code and Blacklist</li> </ul>

No	Date	Subject
39	5th Nov, 2018	<ul style="list-style-type: none"> <li>Site visit at depots of three local bus company(1). Investigation was conducted in terms of infrastructure related to system and network and amount of data to be dealt with at each depot, for the purpose of establishment of AFC system suitable for the actual bus operation. : Nam Ha Noi Bus company,</li> </ul>
40	5th Nov, 2018	<ul style="list-style-type: none"> <li>Site visit at depots of three local bus companies(2): Cau Buou bus company (142 bus, 11 line)</li> </ul>
41	5th Nov, 2018	<ul style="list-style-type: none"> <li>Site visit at depots of three local bus company (3): Tan Dat bus company (68 bus, 5 line))</li> </ul>
42	6th Nov, 2018	<ul style="list-style-type: none"> <li>Confirmation of contents of JCC meeting</li> <li>Discussion on technical specifications (Ticket media)</li> </ul>
43	8th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on proposed AFC system structure suitable for bus services</li> </ul>
44	9th Nov, 2018	<ul style="list-style-type: none"> <li>Site visit at Line 2A. Inspection of installed AFC facility, IC card and operation, and investigation for tasks to be tackled for formulation of common specifications are conducted.</li> <li>Survey of actual AFC trial operation in BRT</li> </ul>
45	9th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on JCC 3rd result in WG3</li> </ul>
46	20th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on common code and gate access log</li> </ul>
47	28th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on specifications for common code, which is used to process data in interoperable use</li> </ul>
48	7th Dec, 2018	<ul style="list-style-type: none"> <li>Technical Specifications (discussion on encode format)</li> </ul>
49	17th Dec, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
50	19th Dec, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
51	21st Dec, 2018	<ul style="list-style-type: none"> <li>Technical Specifications (discussion on encode format)</li> </ul>
52	25th Dec, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
53	11th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (common code, format)</li> </ul>
54	16th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (reader/writer)</li> </ul>
55	17th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (encode process)</li> </ul>
56	22nd Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (trip pattern)</li> </ul>
57	24th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (host system)</li> </ul>
58	28th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion on schedule of further WG3 activities</li> </ul>
59	19th Feb, 2019	<ul style="list-style-type: none"> <li>Discussion on installation of IC card in buses with TRANSERCO</li> </ul>
60	20th Feb, 2019	<ul style="list-style-type: none"> <li>Discussion on work plan and role sharing in 2019</li> <li>Confirmation of list of tasks and role sharing in formulation of technical specifications</li> </ul>
61	20th Feb, 2019	<ul style="list-style-type: none"> <li>Review of project with Mr.Hai (extension of project and other discussions)</li> </ul>
62	20th Feb, 2019	<ul style="list-style-type: none"> <li>Interview with NAPAS about how to apply IC card to other transport</li> <li>Discussion with Ms. Huong on tasks and solutions in the process of project</li> </ul>
63	17th Apr, 2019	<ul style="list-style-type: none"> <li>Site visit at Payoo Corporation to survey the situation of Fintech, which is used for ABT system</li> <li>Site visit at pilot trial at Ho Chi Minh bus, in which ABT system is installed (create an account of ZaloPay, apply for UniPass, issue IC card, take a bus)</li> <li>Sharing opinion with iTD Company, one of the most promising IT company in Vietnam, about ABT and CBT in the structure of AFC system</li> </ul>

No	Date	Subject
64	19th Apr, 2019	<ul style="list-style-type: none"> <li>• Discussion with Vietnamese members about the main text of technical specifications <ul style="list-style-type: none"> <li>➢ Confirmation of progress in outline (to be tackled after conclusion of HPC meeting)</li> </ul> </li> </ul>
65	22nd Apr, 2019	<ul style="list-style-type: none"> <li>• Discussion with Vietnamese members about the main text of technical specifications <ul style="list-style-type: none"> <li>➢ Confirmation of items, schedule and role sharing</li> <li>➢ Vietnamese side raised a problem in lack of resources to be used for contents confirmation</li> </ul> </li> </ul>
66	24th Apr, 2019	<ul style="list-style-type: none"> <li>• Sharing opinion with R&amp;D sector, NAPAS</li> </ul>
67	28th May, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for common code</li> </ul>
68	30th May, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for common code</li> </ul>
69	4th June, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for common code and Encode Format</li> </ul>
70	6th June, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Encode Format</li> </ul>
71	11th June, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Encode Format</li> </ul>
72	13th June, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Ticket Media</li> </ul>
73	18th June, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for R/W and Ticket Validation</li> </ul>
74	20th June, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Ticket Validation</li> </ul>
75	2nd July, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Ticket Validation</li> </ul>
76	4th July, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Ticket Validation</li> </ul>
77	9th July, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Encode Data</li> </ul>
78	18th July, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Encode Data</li> </ul>
79	23rd July, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Encode Data</li> </ul>
80	25th July, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Encode Data</li> </ul>
81	30th July, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Encode Data</li> </ul>
82	6th Aug, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Transaction Data</li> </ul>
83	8th Aug, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Transaction Data</li> </ul>
84	20th Aug, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications (Station code) on request of Hanoi member</li> </ul>
85	22th Aug, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications (Station code) on request of Hanoi member</li> </ul>
86	27th Aug, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Transaction Data and Trip Pattern</li> </ul>
87	10th Sep, 2019	<ul style="list-style-type: none"> <li>• Discussion on project planning</li> </ul>
88	10th Sep, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Host System and Trip Pattern</li> </ul>
89	12th Sep, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Trip Pattern</li> </ul>
90	17th Sep, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Trip Pattern</li> </ul>
91	19th Sep, 2019	<ul style="list-style-type: none"> <li>• Explanation contents and structure of Main report</li> </ul>
92	24th Sep, 2019	<ul style="list-style-type: none"> <li>• Review report of Host System</li> </ul>
93	1st Oct, 2019	<ul style="list-style-type: none"> <li>• Discussion on bus stop code</li> </ul>
94	3rd Oct, 2019	<ul style="list-style-type: none"> <li>• Review main report of WG3</li> </ul>
95	15th Oct, 2019	<ul style="list-style-type: none"> <li>• Pre-discussion on bus stop code (JICA Expert Meeting only)</li> </ul>
96	17th Oct, 2019	<ul style="list-style-type: none"> <li>• Discussion on bus stop code</li> </ul>
97	5th Nov, 2019	<ul style="list-style-type: none"> <li>• Discussion on contents of the seminar in WG3</li> </ul>
98	12th Nov, 2019	<ul style="list-style-type: none"> <li>• Preparation and review on seminar material</li> </ul>
99	26th Nov, 2019	<ul style="list-style-type: none"> <li>• Rehearsal of the seminar and check of the contents</li> </ul>



### Working Group 4 Meeting

No.	Date	Subject
1	21st Aug, 2018	• Confirmation of contents of outline report
2	5th Nov, 2018	• Discussion on organizational structure and staffing requirements under FMC
3	6th Dec, 2018	• Discussion on organizational structure and staffing requirements under FMC
4	19th Dec, 2018	• Discussion on organizational structure and staffing requirements under FMC
5	21st Dec, 2018	• Discussion on contents of outline report
6	23rd Jan, 2019	• Discussion on organizational structure and staffing requirements under FMC
7	27th Mar, 2019	• Discussion on organizational structure and staffing requirements under FMC
8	30th May, 2019	• Discussion on organizational structure and staffing requirements under FMC
9	27th Jun, 2019	• Discussion on terms of reference detailing the specific tasks and responsibilities of each unit under FMC
10	25th Jul, 2019	• Discussion on terms of reference detailing the specific tasks and responsibilities of each unit under FMC
11	28th Aug, 2019	• Discussion on staffing requirement of FMC
12	26th Sep, 2019	• Discussion on staffing requirement of FMC

#### 1.2.2 Output 1: 'Design Guideline and Specifications' for interoperable smart card system are developed.

The progress of Output 1 activities is shown in the table below.

**Table 7: Progress of Output 1 Activities**

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system including MRT, BRT and Bus in Hanoi	Collect the legal documents related to the transportation smart card system as follows;; ✓ Legal systems and standards on smart card system/ transportation smart card system ✓ Design documents of smart card system ✓ International standards for interoperable AFC system ✓ MRT 2A, 3: AFC technical design ✓ MRT 2: AFC technical specifications ✓ BRT1, Route Bus: Specifications and planning documents to introduce ✓ Hanoi City and MOT: Legal system and decision about technical standardization of AFC	- Done	- No activity (N/A)

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
	✓ Central Bank: Decision, regulations, standard regarding smart card and electric money		
1-2 Prepare an outline of 'Design Guideline and Specifications' and the fare policy	1) Examination of ticket specifications for interoperable use 2) Examination of fare system rules for interoperable use 3) Examination of the operational specifications 4) Examination of the technical specifications	- Done	- No activity (N/A)
1-3 Consult with the relevant authorities and finalize the concepts of the 'Design Guideline and Specifications' and the fare policy.	-	- Done	- No activity (N/A)
1-4 Preparation of the drafts of the 'Design Guideline and Specifications' and the fare policy	-	- On going	- Continue discussion for revision of DG/TS
1-5 Consult with the relevant authorities and finalize the 'Design Guideline and Specifications' and the fare policy	-	- On going	- Continue discussion for revision of DG/TS
1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.	- The 1 <sup>st</sup> Seminar was held on 5 December 2018. - The 2 <sup>nd</sup> Seminar was held on 27 November 2019.	- Done	- No activity (N/A)

### 1.2.3 Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.

The progress of Output 2 activities is shown in the table below.

**Table 8: Progress of Output 2 Activities**

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	1) Conduct a survey of relevant laws and regulations 2) Define the scope of work of the Fare Management Center (division)	- Done	- No activity (N/A)

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).	Define the basic six items of operational terms of reference of FMC	- Done	- No activity (N/A)
2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division).	-	- Done	- No activity (N/A)
2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.	1) Prepare a TOR 2) Organizational structure and staff requirements	- On going	- Continue discussion for final version

### 1.3 Achievement of Output

#### 1.3.1 Output 1

Achievement status of Output 1 is as follows.

**Table 9: Verifiable Indicators and Current Status**

Objectively Verifiable Indicator	Baseline	Current Status
The Design Guideline and Specification is prepared.	None	On going

Source: PDM 1.1

#### 1.3.2 Output 2

Achievement status of Output 2 is as follows.

**Table 10: Verifiable Indicators and Current Status**

Objectively Verifiable Indicator	Baseline	Current Status
Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval	None	On going

Source: PDM 1.1

### 1.4 Achievement of the Project Purpose

Also stated in PDM, the achievement of the project purpose shall be evaluated using verifiable indicators.

**Table 11: Verifiable Indicators and Current Status**

Objectively verifiable indicators	Baseline	Current Status
- 'Design Guideline and Technical Specifications' are approved by HPC	None	On going
- The public transport fare policy is established	None	On going

Source: PDM 1.1

To achieve the project purpose, the JICA Project Team (JPT) identify the required knowledge and skills by each output shown in the following table. Result of the baseline survey were evaluated on a five-level scale as indicated below and illustrated in following figures.

- (1) Newbie: I don't know the process/ concept;
- (2) Novice: I know the process/ concept, but I have never done it;
- (3) Young Expert: I have done it once, but I have not reported or presented the results;
- (4) Expert: I have done it twice or more/ I have done it once and reported or presented the results;  
and
- (5) Senior Expert: I have done it twice or more, and reported or presented the results.

**Table 12 Required Knowledge and Skills per Project Output and Activity**

Expected Output	Activities	Required Knowledge & Skills
(1) The 'Design Guideline and Specification' is prepared.	1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system including MRT, BRT and Bus in Hanoi	Information collection capability, Issue solving capability
	1-2 Prepare of outline of 'Design Guideline and Specifications' and the fare policy	(1) Basic knowledge of a) Ticket specifications, b) Fare system c) Operation system d) Technical specification e) Host system  (2) Capability for development of a) Rules for common ticket b) Rules for fare c) Rules for operation specification d) Rules for technology implementing specification e) Host system specification
	1-3 Consult with the relevant authorities and finalize the concepts of the 'Design Guideline and Specifications' and the fare policy.	
	1-4 Preparation of the drafts of the 'Design Guideline and Specifications' and the fare policy	
	1-5 Consult with the relevant authorities and finalize the 'Design Guideline and Specifications' and the fare policy	
	1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.	
(2) Organizational terms of reference for the proposed	2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	

Expected Output	Activities	Required Knowledge & Skills
Fare Management Center (Division) is drafted and submitted for approval	2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).	(1) Basic knowledge of the scope of works (functions) (2) Capability for development of the scope of work(function)
	2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division).	(1) Basic knowledge of work description (2) Capability for development of work description
	2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.	(1) Basic knowledge of a) Operational terms of reference b) Terms of reference for staffing (2) Capability for development of rules for operation and management of Fare Management Center

The first baseline survey was conducted in April 2018 to measure the current knowledge and skills level. The average scores are shown in the following table.

**Table 13 Average Score for each Output**

Time	Output 1: development of DG/TS for interoperable smart card system	Output 2: development of Organizational TOR of each unit of the FMC
When the Project launched (April 2018)	2.49	3.33
When basic policy was formulated (December 2018)	3.03	3.67
When draft DG/TS and draft TOR of FMC (October 2019)	3.56	4.00

### 1.5 Changes of Risks and Actions for Mitigation

N/A

### 1.6 Progress of Actions undertaken by JICA

N/A

### 1.7 Progress of Actions undertaken by The People's Committee of Hanoi

N/A

### 1.8 Progress of Environmental and Social Considerations (if applicable)

N/A

### 1.9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

N/A

### 1.10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)

Project is implemented in the context of many movements/fluctuations. Such as Line 2A, Line 3 in the completion process, pilot smart card on BRT Line... Especially, Hanoi started to develop a smart city... They create new several requirements for Project.

### 1.11 Tasks to be implemented by JICA Project Team and Counterparts

Work	Tasks	Implementing agencies
Output 1: 'Design Guideline and Specifications' for interoperable smart card system are developed		
N/A	N/A	N/A
Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.		
N/A	N/A	N/A

## 2 Delay of Work Schedule and/or Problems (if any)

### 2.1 Cause

#### (1) Delay in assignment of counterparts

In the 1st Joint Coordination Committee (JCC) meeting, it was agreed that WG members would be assigned in February 2018. However, the members were actually determined in 29 March 2018 (Decision No. 341/QD-SGTVT).

#### (2) Delay caused by comparative study between CBT and ABT

In compliance with Decision 3978/QD-UBND, the Project Team submitted to HDOT the outline of DG/TS based on the card-based ticketing (CBT) system. This outline of DG/TS underwent the approval process. Although this Project is based on the assumption of adopting the CBT system, Hanoi City proposed to Japan International Cooperation Agency (JICA) to consider account-based ticketing (ABT) system with a perspective of the smart city concept. This led to comparative study between the CBT and ABT systems, which concluded application of the CBT system. The outline of DG/TS was finally approved in 26 April 2019, three months after the submission.

### 2.2 Action to be taken

#### (1) Assignment of counterparts

In spite of the delay in assignment of WG members at the start of this Project, they actively involved themselves in the Project, including approximately 190 WG meetings. Moreover, participation of IT companies in Hanoi was approved at 4<sup>th</sup> JCC held in 29 August 2019, which allowed members familiar with IT in Hanoi to join the WGs, contributing to formulating the DG/TS based on the actual situation of the city. Director and Vice

Director of HDOT, and director of Hanoi Urban Transport Management and Operation Center (TRAMOC) also take active part in the project, closely communicating with the Project Team.

**(2) Comparative study between CBT and ABT**

A study meeting was held in 19 April 2019 chaired by Chairman of HPC. As a result, it was decided to continue the Project based on the submitted outline of DG/TS. This outline was approved in 26 April 2019 (HPC letter No. 1648/UBND-DT).

**2.3 Roles of Responsible Persons/Organization (JICA, The People's Committee of Hanoi, etc.)**

N/A

**3 Modification of the Project Implementation Plan**

**3.1 PO**

**3.2 Other modifications on detailed implementation plan**

**II. Project Monitoring Sheet I & II** *as Attached*

**Project Monitoring Sheet I (Project Design Matrix)**

**Version 6**

**Project title:** Project for Supporting Development of Interoperable Smart Card System for Public Transportation in Hanoi

**Dated. 6 December 2019**

**Project Area:** Hanoi

**Target Group:** Hanoi People's Committee (HPC) and organizations related to public transportation in Hanoi

**Counterpart:** HPC (Hanoi Department of Transport (DOT), Hanoi Department of Science and Technology (DOST), Hanoi Department of Information and Communication (DOIC), Hanoi Metro Company (HMC), Hanoi Transport Corporation (TRANSERCO))

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption	Achievement	Remarks
<b>Overall Goal</b>					
Interoperable smart card systems are developed for the public transportation in Hanoi	<ul style="list-style-type: none"> <li>Number of public transport operators applying the 'Design Guideline and Specifications' developed under the Project to realize interoperable smart card system.</li> <li>Ratio of satisfaction on interoperable smart card is more than XX%.</li> </ul>	Survey report(s)			
<b>Project Purpose</b>					
Technical and management capacities of counterpart agencies under HPC are improved for the development of interoperable smart card system for public transportation in Hanoi	<ul style="list-style-type: none"> <li>'Design Guideline and Specifications' are approved by HPC.</li> <li>The public transport fare policy is established.</li> </ul>	<ul style="list-style-type: none"> <li>Approved 'Design Guideline and Specifications'</li> <li>Project progress report</li> </ul>	Decision no. 3978/QD-UBND dated 13 August 2015 on use of interoperable smart card in public transportation in Hanoi continues to be effective.		
<b>Outputs</b>					
1. 'Design Guideline and Specifications' for interoperable smart card system are developed.	'Design Guideline and Specifications' are finalized.	'Design Guideline and Specifications' (final version)	HPC reviews policy/documents developed under the Project in a timely manner.		
2. Organization terms of reference of each unit of the Fare Management Center (Division) are developed.	Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval.	Organizational terms of reference for the Fare Management Center (Division) (draft for approval)			

Activities	Input		Pre-conditions
	Japanese Side	Vietnamese Side	
1-1. Collect and analyze information on the existing and approved smart card systems for the public transportation system in Hanoi	1. Japanese Experts - Leader - Public Transport Fare Policy and System - Interoperable Smart Card System - Communication System - Fare Management System	1. Project Counterparts (1) HPC (2) HDOT - Road Transportation Management Division - Planning and Investment Division - Economics planning Division - TRAMOC (3) DOST (4) DOIC (5) HMC (6) TRANSERCO 2. Provision of Office Space and equipment 3. Cost for - counterpart members - office operation and maintenance - others (local travel expenses excluding airfare for Vietnamese side, etc.)	Official request to apply for Japan's ODA Loan Project.
1-2. Prepare an outline of 'Design Guideline and Specifications' and fare policy  1) Examination of fare ticket specifications for interoperable use 2) Examination of fare system rules for interoperable use 3) Examination of the operation rules 4) Examination of the technical specifications	2. Counterpart Training in Japan 3. Seminar and workshop 4. Other cost - Local experts and consultants - Local staff - Others (survey, card rental, etc.)		
1-3. Consult with the relevant authorities and finalize the outline of the 'Design Guideline and Specifications' and fare policy			
1-4. Draft a 'Design Guideline and Specifications' with fare policy			
1-5. Consult with the relevant authorities and finalize the 'Design Guideline and Specifications'			
1-6. Conduct seminar(s) to introduce the draft 'Design Guideline Specifications' and fare policy			
2-1. Define the scope of work to be performed by the proposed Fare Management Center (Division)  1) Conduct a survey of relevant laws and regulations 2) Define the scope of work of the fare management center (division)			
2-2. Define the tasks and responsibilities of departments/division under the Fare Management Center (Division)			
2-3. Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division)			
2-4. Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.  1) Prepare a TOR 2) Organizational structure and staff requirements			





## PROJECT MONITORING SHEET

**Project Title:** The Project for Supporting Development of Interoperable Smart Card System for Public Transport in Hanoi

**Version of the Sheet:** Ver. 6 (Term: 2017 - 2020)

**Name:** Mr. Michimasa TAKAGI

**Title:** Team Leader/ Urban Public Transport

**Submission Date:** June 2020

### I. Summary

#### 1 Progress

This monitoring sheet covers the period from project commencement in **December 2017** up to **the end of May 2020**.

#### 1.1 Progress of Inputs

##### 1.1.1 Experts

**Table 1: Input of Experts as of End-July**

Designation	Name	No. of PMs
Team Leader/ Urban Public Transport	M. TAKAGI	6.32
Deputy Team Leader/ AFC Technical Management	T. OTSUKI	7.18
Public Transport Fare Policy [Railway]	S. HORIUCHI	2.92
Public Transport Fare Policy [Railway]	R. SAITO	1.60
Public Transport Fare Policy [Bus]	T. KUMAI	2.13
Interoperable Smart Card Plan	T. UMEKAWA	0.97
Smart Card Data Management and Utilization	N. MIZOGUCHI	0.00
Interoperable Smart Card System [Railway]	T. FUKATSU	4.02
Interoperable Smart Card System [Bus]1	A. TANAKA	2.87
Interoperable Smart Card System [Bus]2	H. MIYAHARA	2.80
Communication System	K. HONDA	3.00
Fare Management System [AFC Technical Specification]	H. KUWANO	0.57

Fare Management System [AFC Technical Specification]	Y. WATABE	6.73
Fare Management system [AFC Host System]	Y. SAKAMOTO	1.50
Organization Institution	A. SAKUMA	1.50
Monitoring/ Training in Japan/ Coordination	M. OHNO	4.47
TOTAL PMs		48.58 (85.1%)
Planned PMs		57.10

## 1.2 Progress of Activities

### 1.2.1 Joint Coordinating Committee and Working Group Meetings

Four Joint Coordinating Committee (JCC) meetings and several working group (WG) meetings were held during the period.

**Table 2: Joint Coordinating Committee and Working Group Meetings**

#### Joint Coordination Committee Meeting

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
1	First JCC meeting	2 February 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	<ol style="list-style-type: none"> <li>1) Outline of Work Plan (Draft)</li> <li>2) Confirmation of the Undertakings by Vietnamese Side</li> </ol>
2	Second JCC Meeting	22 August 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	<ol style="list-style-type: none"> <li>1) Progress of the project</li> <li>2) Proposal from WG</li> <li>3) Items to be confirmed by Hanoi-city</li> <li>4) Activity plans</li> </ol>
3	Third JCC Meeting	7 November 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	<ol style="list-style-type: none"> <li>1) Achievements in the 1st Year</li> <li>2) Explanation for Outline of 'Design Guideline and Specifications 'and Fare Policy</li> <li>3) Activities in Next Period</li> </ol>
4	Fourth JCC Meeting	29 August 2019	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	<ol style="list-style-type: none"> <li>1) Report about Project Implementation</li> <li>2) Remaining Items</li> <li>3) Plan/Procedure to obtain appraisal, approval on Design Guidelines and Technical Specifications</li> <li>4) Proposal on AFC system implementation under the city bus network (applying Project outputs)</li> <li>5) Proposal about Project extension</li> </ol>

#### Meeting among WGs/Meeting with Originations

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
1	1st WG Leader Meeting	23 August 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	<ol style="list-style-type: none"> <li>1) Ideal AFC Model in Hanoi</li> <li>2) Confirmation of 2nd JCC</li> </ol>

PM Form 3-1 Monitoring Sheet Summary

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
2	2nd WG Leader Meeting	4 December 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Progress of the project since last JCC meeting 2) Response to the notice by HPC 3) Confirmation of the materials and preparations for the seminar
3	3rd WG Leader Meeting	6 December 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Reflection of the seminar for the formulation of Outline Report 2) Site Visit at TRAMOC (Bus Operator) Demo for Bus unit
4	JICA-JET meeting for the fourth JCC meeting	23 August 2019	JICA Headquarters, JICA Viet Nam Office, JICA Expert Team	1) Topics and materials in JCC meeting
5	Inter-Working Group Meeting	29 August 2019	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Transfer discount 2) Valid period of season passes
6	Inter-Working Group Meeting (JET only)	3 October 2019	JICA Expert Team	1) Confirmation of draft DG/TS
7	Inter-Working Group Meeting	3 October 2019	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Confirmation of remaining items
8	Orientation Meeting	4 October 2019	JICA Headquarters, JICA Viet Nam Office, JICA Expert Team	1) Confirmation on how to develop outputs and schedule
9	General Meeting with JICA	7th October 2019	JICA Headquarters, JICA Expert Team	1) Contents of outputs and the seminar
10	Inter-Working Group Meeting (JET only)	27th November 2019	JICA Expert Team	1) Review of the seminar and orientation
11	Meeting with HDOT	29th November 2019	HDOT, JICA Expert Team	1) Schedule of the project
12	Meeting with HDOT and TRAMOC	25th December 2019	HDOT, TRAMOC, JICA Expert Team	1) Schedule of the project 2) Confirmation on remaining items 3) Training in Japan
13	Meeting at Ho Chi Minh City	16th January 2020	HCMC-DOT, MAUR, HCMC-Metro, JICA, WB, NJPT, JICA Expert Team	1) Opinion exchange about interoperable use of IC card
14	JET Meeting	13th February 2020	JICA Expert Team	1) Confirmation of revision policy of the DG/TS

Seminar

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
1	1st Seminar	5 December 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Project Overview and Introduction of Basic Approach on Interoperable Smart Card System for Public Transportation in Hanoi

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
2	2nd Seminar	27th November 2019	HDOT, HDOF, HDOST, HDOIC, SBV, HMC, TRANSERCO, MOT, TRAMOC. Construction Association, BIDV, IT Agribank, Vietcombank, Viettel, MK Group, ITD, VNPT, NAPAS, ADB, WB, ABeam Consulting (Vietnam), Viet Nam Tokyo Metro, TOPPAN FORMS, Sony Imaging Products & Solutions, Sony Electronics Vietnam, JCB International	1) Overview of the draft DG/TS

### Working Group 1 Meeting

No.	Date	Subject
1	16th Apr, 2018	<ul style="list-style-type: none"> <li>Outline of the expected output of WG1</li> <li>Confirmation of the activity schedule</li> </ul>
2	29rd May, 2018	<ul style="list-style-type: none"> <li>Explanation of the Fare Management System in Japan</li> </ul>
3	30th May, 2018	<ul style="list-style-type: none"> <li>Discussion on the feasibility to install each system into Hanoi</li> </ul>
4	5th Jun, 2018	<ul style="list-style-type: none"> <li>Explanation of the Fare Management System in other countries</li> </ul>
5	25th Jul, 2018	<ul style="list-style-type: none"> <li>Clarification of the items to be discussed</li> <li>Discussion on the reporting to the 2nd JCC</li> </ul>
6	19th Sep, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents of outline report</li> </ul>
7	20th Sep, 2018	<ul style="list-style-type: none"> <li>Explanation of transfer discount in other countries</li> </ul>
8	28th Nov, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents of seminar</li> <li>Confirmation of items to be discussed in the upcoming WG1</li> </ul>
9	7th Dec, 2018	<ul style="list-style-type: none"> <li>Confirmation of distance-based fare</li> <li>Discussion on ticket type</li> </ul>
10	14th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion on the way of transfer discount</li> </ul>
11	17th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion on ticket types and information on card surface</li> </ul>
12	22nd Jan, 2019	<ul style="list-style-type: none"> <li>Confirmation of the result of discussion and table of contents of the output</li> </ul>
13	26th Feb, 2019	<ul style="list-style-type: none"> <li>Confirmation of contents of fare system guideline (proposed)</li> </ul>
14	14th Mar, 2019	<ul style="list-style-type: none"> <li>Confirmation of the comment from Vietnamese side against fare system guideline (proposed)</li> </ul>
15	20th Mar, 2019	<ul style="list-style-type: none"> <li>Reconfirmation of the whole structure of outputs in line with the work plan</li> <li>Confirmation of the tasks from April</li> </ul>
16	25th Mar, 2019	<ul style="list-style-type: none"> <li>Confirmation of the response toward the comments from Vietnamese side against fare system guideline (proposed)</li> </ul>
17	13rd Jun, 2019	<ul style="list-style-type: none"> <li>Discussion on how to deal with fare system guideline</li> </ul>
18	18th Jun, 2019	<ul style="list-style-type: none"> <li>Leader meeting with Mr. Binh (vice director of TRAMOC)</li> </ul>
19	16th Jul, 2019	<ul style="list-style-type: none"> <li>Discussion on how to deal with fare system guideline</li> </ul>
20	23rd Aug, 2019	<ul style="list-style-type: none"> <li>Discussion on how to deal with fare system guideline</li> </ul>
21	4th Oct, 2019	<ul style="list-style-type: none"> <li>Discussion and Confirmation on draft technical cooperation outputs</li> </ul>
22	24th Oct, 2019	<ul style="list-style-type: none"> <li>Confirmation on outputs with WG3 (JICA Expert Team only)</li> </ul>

23	31st Oct, 2019	• Arrangement and material of the seminar (JICA Expert Team only)
24	25th Nov, 2019	• Discussion on contents of the seminar

### Working Group 2 Meeting

No.	Date	Subject
1	12th Apr, 2018	<ul style="list-style-type: none"> <li>• Procedure on WG2 activities "Development of Operational Specification"</li> <li>• Explanation of the draft proposal of the list of Operational Specification</li> <li>• Outline of the expected final output of WG2</li> <li>• Confirmation of the activity schedule</li> </ul>
2	13rd Apr, 2018	<ul style="list-style-type: none"> <li>• Outline of the expected final output of the Operational Specification</li> <li>• Confirmation of the activity schedule</li> </ul>
3	30th May, 2018	<ul style="list-style-type: none"> <li>• Explanation of the draft proposal of the list of Operational Specification</li> <li>• Re-issue and re-issue registration (Assignment)</li> <li>• Card life cycle</li> </ul>
4	31st May, 2018	• Boarding and Alighting from railway, BRT and bus
5	21st June, 2018	• Discussion on the Operational Specification
6	5th July, 2018	• Interview about operation of railway, BRT and bus
7	21st Aug, 2018	• Confirmation of the contents of outline report
8	6th Nov, 2018	• Discussion on the operational flow in the use of interoperable IC card
9	8th Nov, 2018	• Discussion on the operational flow in the use of interoperable IC card
10	4th Dec, 2018	• Discussion on the operational flow in the use of interoperable IC card
11	18th Dec, 2018	• Discussion on the operational flow in the use of interoperable IC card
12	22nd Jan, 2019	• Discussion on the operational flow in the use of interoperable IC card
13	24th Jan, 2019	• Discussion on the operational flow in the use of interoperable IC card
14	26th Mar, 2019	• Discussion on the operational flow in the use of interoperable IC card
15	29th May, 2019	• Discussion on the operational flow in the use of interoperable IC card
16	26th Jun, 2019	• Discussion on the operational flow in the use of interoperable IC card
17	24th Jul, 2019	• Discussion on the operational flow in the use of interoperable IC card
18	28th Aug, 2019	• Discussion on the operational flow in the use of interoperable IC card
19	30th Oct, 2019	• Discussion on the DG/TS regarding the use of interoperable IC card
20	31st Oct, 2019	• Discussion on the DG/TS regarding the use of interoperable IC card
21	26th Nov, 2019	• Discussion on contents of the seminar
22	19th Dec, 2019	• Discussion on the fare deduction method
23	14th Jan, 2020	• Discussion on the fare deduction method

### Working Group 3 Meeting

No	Date	Subject
1	12th Apr, 2018	<ul style="list-style-type: none"> <li>• Discussion on WG3 activity planning <ul style="list-style-type: none"> <li>➢ Confirmation on WBS, operation plan</li> <li>➢ Sharing the target deliverables of WG3 (AFC technical specification)</li> </ul> </li> </ul>

No	Date	Subject
2	13th Apr, 2018	<ul style="list-style-type: none"> <li>➢ Review on AFC system interoperable use</li> <li>• Lecture for understanding of AFC system, basic terms and structure</li> <li>• Review and discussion on Hanoi AFC technical framework (3978) from interoperable perspective.</li> </ul>
3	21st May, 2018	<ul style="list-style-type: none"> <li>• Explanation of AFC survey report on public transportation interoperability in Hanoi City. (BRT, Line2A, Line3, laws and regulations)</li> <li>• Review on overview on AFC technical specification and IC card issuance process</li> <li>• Procedure on WG3 activities and planning for upcoming 3 months</li> </ul>
4	22nd May, 2018	<ul style="list-style-type: none"> <li>• Understanding of AFC technical specification               <ul style="list-style-type: none"> <li>➢ Explanation and discussion on each AFC technical specification item. (ticket media, R/W, Smartcard IC format, encoding process/format, common code, ticket validation, transaction data and set value, black list, trip pattern, host system)</li> </ul> </li> </ul>
5	23rd May, 2018	
6	24th May, 2018	
7	25th May, 2018	
8	28th May, 2018	
9	29th May, 2018	
10	30th May, 2018	
11	4th June, 2018	• Review of proposal of FMC by TRAMOC (2015):
12	8th June, 2018	• Framework of Technical Specification for Host System
13	11th June, 2018	<ul style="list-style-type: none"> <li>• Clarification key points of AFC interoperable technical specification for Hanoi               <ul style="list-style-type: none"> <li>➢ Acquire the important key point for AFC technical specification to be introduced in Hanoi city</li> <li>➢ Listing up the discussion items with other WGs.</li> </ul> </li> </ul>
14	13th June, 2018	
15	15th June, 2018	
16	19th June, 2018	
17	26th June, 2018	
18	27th June, 2018	
19	29th June, 2018	
20	4th July, 2018	
21	27th June, 2018	• MK smart factory visit for IC card manufacturing tour and study on interoperable bus R/W.
22	19th July, 2018	<ul style="list-style-type: none"> <li>• Review of Drafted outline of AFC technical specification.               <ul style="list-style-type: none"> <li>➢ Create and review draft version of outline of AFC technical specification.</li> </ul> </li> </ul>
23	23rd July, 2018	
24	23rd July, 2018	<ul style="list-style-type: none"> <li>• Visit to HMC               <ul style="list-style-type: none"> <li>➢ Technical Information of Line 2A</li> <li>➢ Communication with HMC</li> </ul> </li> </ul>
25	24th July, 2018	• Review of Drafted outline of AFC technical specification.
26	31st July, 2018	• Review of BRT document from Viettel (rev3.2)
27	31st July, 2018	• Review Host system of Drafted outlines of Technical Specification (ver. 0.12)
28	24th July, 2018	<ul style="list-style-type: none"> <li>• Review BRT AFC document from Viettel</li> <li>• On site review of demonstration of AFC system for pilot test and confirmation of technical details with Transerco-Viettel BRT project members</li> <li>• Review on summary of main point discussed and Study of coping plan</li> </ul>
29	27th July, 2018	
30	8th Aug, 2018	
31	10th Aug, 2018	

PM Form 3-1 Monitoring Sheet Summary

No	Date	Subject
32	14th Aug, 2018	<ul style="list-style-type: none"> <li>Joint meeting with WG1, WG2 and WG4 to shaping consensus on main point discussed proposed by WG3</li> </ul>
33	16th Aug, 2018	
34	21st Aug, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents to be reported in JCC (Discussion on role sharing in formulation of the technical specifications)</li> </ul>
35	24th Aug, 2018	<ul style="list-style-type: none"> <li>Discussion on host system specifications</li> </ul>
36	7th Sep, 2018	<ul style="list-style-type: none"> <li>Discussion on contents and sharing of work between Japanese and Vietnamese sides in formulation of the technical specifications (common code)</li> </ul>
37	3rd Oct, 2018	<ul style="list-style-type: none"> <li>Discussion on common code</li> </ul>
38	5th Oct, 2018	<ul style="list-style-type: none"> <li>Discussion on common code and Blacklist</li> </ul>
39	5th Nov, 2018	<ul style="list-style-type: none"> <li>Site visit at depots of three local bus company(1). Investigation was conducted in terms of infrastructure related to system and network and amount of data to be dealt with at each depot, for the purpose of establishment of AFC system suitable for the actual bus operation. : Nam Ha Noi Bus company,</li> </ul>
40	5th Nov, 2018	<ul style="list-style-type: none"> <li>Site visit at depots of three local bus companies(2): Cau Buou bus company (142 bus, 11 line)</li> </ul>
41	5th Nov, 2018	<ul style="list-style-type: none"> <li>Site visit at depots of three local bus company (3): Tan Dat bus company (68 bus, 5 line))</li> </ul>
42	6th Nov, 2018	<ul style="list-style-type: none"> <li>Confirmation of contents of JCC meeting</li> <li>Discussion on technical specifications (Ticket media)</li> </ul>
43	8th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on proposed AFC system structure suitable for bus services</li> </ul>
44	9th Nov, 2018	<ul style="list-style-type: none"> <li>Site visit at Line 2A. Inspection of installed AFC facility, IC card and operation, and investigation for tasks to be tackled for formulation of common specifications are conducted.</li> <li>Survey of actual AFC trial operation in BRT</li> </ul>
45	9th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on JCC 3rd result in WG3</li> </ul>
46	20th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on common code and gate access log</li> </ul>
47	28th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on specifications for common code, which is used to process data in interoperable use</li> </ul>
48	7th Dec, 2018	<ul style="list-style-type: none"> <li>Technical Specifications (discussion on encode format)</li> </ul>
49	17th Dec, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
50	19th Dec, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
51	21st Dec, 2018	<ul style="list-style-type: none"> <li>Technical Specifications (discussion on encode format)</li> </ul>
52	25th Dec, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
53	11th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (common code, format)</li> </ul>
54	16th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (reader/writer)</li> </ul>
55	17th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (encode process)</li> </ul>
56	22nd Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (trip pattern)</li> </ul>
57	24th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (host system)</li> </ul>
58	28th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion on schedule of further WG3 activities</li> </ul>
59	19th Feb, 2019	<ul style="list-style-type: none"> <li>Discussion on installation of IC card in buses with TRANSERCO</li> </ul>
60	20th Feb, 2019	<ul style="list-style-type: none"> <li>Discussion on work plan and role sharing in 2019</li> <li>Confirmation of list of tasks and role sharing in formulation of technical specifications</li> </ul>
61	20th Feb, 2019	<ul style="list-style-type: none"> <li>Revie of project with Mr.Hai (extension of project and other discussions)</li> </ul>



No	Date	Subject
62	20th Feb, 2019	<ul style="list-style-type: none"> <li>• Interview with NAPAS about how to apply IC card to other transport</li> <li>• Discussion with Ms. Huong on tasks and solutions in the process of project</li> </ul>
63	17th Apr, 2019	<ul style="list-style-type: none"> <li>• Site visit at Payoo Corporation to survey the situation of Fintech, which is used for ABT system</li> <li>• Site visit at pilot trial at Ho Chi Minh bus, in which ABT system is installed (create an account of ZaloPay, apply for UniPass, issue IC card, take a bus)</li> <li>• Sharing opinion with iTD Company, one of the most promising IT company in Vietnam, about ABT and CBT in the structure of AFC system</li> </ul>
64	19th Apr, 2019	<ul style="list-style-type: none"> <li>• Discussion with Vietnamese members about the main text of technical specifications <ul style="list-style-type: none"> <li>➢ Confirmation of progress in outline (to be tackled after conclusion of HPC meeting)</li> </ul> </li> </ul>
65	22nd Apr, 2019	<ul style="list-style-type: none"> <li>• Discussion with Vietnamese members about the main text of technical specifications <ul style="list-style-type: none"> <li>➢ Confirmation of items, schedule and role sharing</li> <li>➢ Vietnamese side raised a problem in lack of resources to be used for contents confirmation</li> </ul> </li> </ul>
66	24th Apr, 2019	<ul style="list-style-type: none"> <li>• Sharing opinion with R&amp;D sector, NAPAS</li> </ul>
67	28th May, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for common code</li> </ul>
68	30th May, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for common code</li> </ul>
69	4th June, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for common code and Encode Format</li> </ul>
70	6th June, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Encode Format</li> </ul>
71	11th June, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Encode Format</li> </ul>
72	13th June, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Ticket Media</li> </ul>
73	18th June, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for R/W and Ticket Validation</li> </ul>
74	20th June, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Ticket Validation</li> </ul>
75	2nd July, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Ticket Validation</li> </ul>
76	4th July, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Ticket Validation</li> </ul>
77	9th July, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Encode Data</li> </ul>
78	18th July, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Encode Data</li> </ul>
79	23rd July, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Encode Data</li> </ul>
80	25th July, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Encode Data</li> </ul>
81	30th July, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Encode Data</li> </ul>
82	6th Aug, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Transaction Data</li> </ul>
83	8th Aug, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Transaction Data</li> </ul>
84	20th Aug, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications (Station code) on request of Hanoi member</li> </ul>
85	22th Aug, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications (Station code) on request of Hanoi member</li> </ul>
86	27th Aug, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Transaction Data and Trip Pattern</li> </ul>
87	10th Sep, 2019	<ul style="list-style-type: none"> <li>• Discussion on project planning</li> </ul>
88	10th Sep, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Host System and Trip Pattern</li> </ul>
89	12th Sep, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Trip Pattern</li> </ul>
90	17th Sep, 2019	<ul style="list-style-type: none"> <li>• Detailed review of specifications for Trip Pattern</li> </ul>
91	19th Sep, 2019	<ul style="list-style-type: none"> <li>• Explanation contents and structure of Main report</li> </ul>
92	24th Sep, 2019	<ul style="list-style-type: none"> <li>• Review report of Host System</li> </ul>
93	1st Oct, 2019	<ul style="list-style-type: none"> <li>• Discussion on bus stop code</li> </ul>

No	Date	Subject
94	3rd Oct, 2019	• Review main report of WG3
95	15th Oct, 2019	• Pre-discussion on bus stop code (JICA Expert Meeting only)
96	17th Oct, 2019	• Discussion on bus stop code
97	5th Nov, 2019	• Discussion on contents of the seminar in WG3
98	12th Nov, 2019	• Preparation and review on seminar material
99	26th Nov, 2019	• Rehearsal of the seminar and check of the contents
100	26th Dec, 2019	• Bus stop code structure and confirmation on reflection of the comments at the seminar

### Working Group 4 Meeting

No.	Date	Subject
1	21st Aug, 2018	• Confirmation of contents of outline report
2	5th Nov, 2018	• Discussion on organizational structure and staffing requirements under FMC
3	6th Dec, 2018	• Discussion on organizational structure and staffing requirements under FMC
4	19th Dec, 2018	• Discussion on organizational structure and staffing requirements under FMC
5	21st Dec, 2018	• Discussion on contents of outline report
6	23rd Jan, 2019	• Discussion on organizational structure and staffing requirements under FMC
7	27th Mar, 2019	• Discussion on organizational structure and staffing requirements under FMC
8	30th May, 2019	• Discussion on organizational structure and staffing requirements under FMC
9	27th Jun, 2019	• Discussion on terms of reference detailing the specific tasks and responsibilities of each unit under FMC
10	25th Jul, 2019	• Discussion on terms of reference detailing the specific tasks and responsibilities of each unit under FMC
11	28th Aug, 2019	• Discussion on staffing requirement of FMC
12	26th Sep, 2019	• Discussion on staffing requirement of FMC
13	19th Dec, 2019	• Confirmation on Organizational TOR of FMC

### 1.2.2 Output 1: 'Design Guideline and Specifications' for interoperable smart card system are developed.

The progress of Output 1 activities is shown in the table below.

**Table 7: Progress of Output 1 Activities**

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system including MRT, BRT and Bus in Hanoi	Collect the legal documents related to the transportation smart card system as follows;; ✓ Legal systems and standards on smart card system/ transportation smart card system ✓ Design documents of smart card system	- Done	- No activity (N/A)

PM Form 3-1 Monitoring Sheet Summary

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
	<ul style="list-style-type: none"> <li>✓ International standards for interoperable AFC system</li> <li>✓ MRT 2A, 3: AFC technical design</li> <li>✓ MRT 2: AFC technical specifications</li> <li>✓ BRT1, Route Bus: Specifications and planning documents to introduce</li> <li>✓ Hanoi City and MOT: Legal system and decision about technical standardization of AFC</li> <li>✓ Central Bank: Decision, regulations, standard regarding smart card and electric money</li> </ul>		
1-2 Prepare an outline of 'Design Guideline and Specifications' and the fare policy	<ol style="list-style-type: none"> <li>1) Examination of ticket specifications for interoperable use</li> <li>2) Examination of fare system rules for interoperable use</li> <li>3) Examination of the operational specifications</li> <li>4) Examination of the technical specifications</li> </ol>	- Done	- No activity (N/A)
1-3 Consult with the relevant authorities and finalize the concepts of the 'Design Guideline and Specifications' and the fare policy.	-	- Done	- No activity (N/A)
1-4 Preparation of the drafts of the 'Design Guideline and Specifications' and the fare policy	-	- On going	- Continue discussion for revision of DG/TS
1-5 Consult with the relevant authorities and finalize the 'Design Guideline and Specifications' and the fare policy	-	- On going	- Continue discussion for revision of DG/TS
1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.	<ul style="list-style-type: none"> <li>- The 1<sup>st</sup> Seminar was held on 5 December 2018.</li> <li>- The 2<sup>nd</sup> Seminar was held on 27 November 2019.</li> </ul>	- Done	- No activity (N/A)

**1.2.3 Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.**

The progress of Output 2 activities is shown in the table below.

**Table 8: Progress of Output 2 Activities**

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	1) Conduct a survey of relevant laws and regulations 2) Define the scope of work of the Fare Management Center (division)	- Done	- No activity (N/A)
2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).	Define the basic six items of operational terms of reference of FMC	- Done	- No activity (N/A)
2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division).	-	- Done	- No activity (N/A)
2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.	1) Prepare a TOR 2) Organizational structure and staff requirements	- On going	- Continue discussion for final version

**1.3 Achievement of Output**

**1.3.1 Output 1**

Achievement status of Output 1 is as follows.

**Table 9: Verifiable Indicators and Current Status**

Objectively Verifiable Indicator	Baseline	Current Status
The Design Guideline and Specification is prepared.	None	On going

Source: PDM 1.1

**1.3.2 Output 2**

Achievement status of Output 2 is as follows.

**Table 10: Verifiable Indicators and Current Status**

Objectively Verifiable Indicator	Baseline	Current Status
----------------------------------	----------	----------------

Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval	None	On going
--	------	----------

Source: PDM 1.1

#### 1.4 Achievement of the Project Purpose

Also stated in PDM, the achievement of the project purpose shall be evaluated using verifiable indicators.

**Table 11: Verifiable Indicators and Current Status**

Objectively verifiable indicators	Baseline	Current Status
- 'Design Guideline and Technical Specifications' are approved by HPC	None	On going
- The public transport fare policy is established	None	On going

Source: PDM 1.1

To achieve the project purpose, the JICA Project Team (JPT) identify the required knowledge and skills by each output shown in the following table. Result of the baseline survey were evaluated on a five-level scale as indicated below and illustrated in following figures.

- (1) Newbie: I don't know the process/ concept;
- (2) Novice: I know the process/ concept, but I have never done it;
- (3) Young Expert: I have done it once, but I have not reported or presented the results;
- (4) Expert: I have done it twice or more/ I have done it once and reported or presented the results;  
and
- (5) Senior Expert: I have done it twice or more, and reported or presented the results.

**Table 12 Required Knowledge and Skills per Project Output and Activity**

Expected Output	Activities	Required Knowledge & Skills
(1) The 'Design Guideline and Specification' is prepared.	1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system including MRT, BRT and Bus in Hanoi	Information collection capability, Issue solving capability
	1-2 Prepare of outline of 'Design Guideline and Specifications' and the fare policy	(1) Basic knowledge of a) Ticket specifications, b) Fare system c) Operation system d) Technical specification e) Host system
	1-3 Consult with the relevant authorities and finalize the concepts of the 'Design Guideline and Specifications' and the fare policy.	
	1-4 Preparation of the drafts of the 'Design Guideline and Specifications' and the fare policy	
	1-5 Consult with the relevant authorities and finalize the 'Design Guideline and Specifications' and the fare policy	
		(2) Capability for development of a) Rules for common ticket

Expected Output	Activities	Required Knowledge & Skills
	1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.	b) Rules for fare c) Rules for operation specification d) Rules for technology implementing specification e) Host system specification
(2) Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval	2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	(1) Information collection capability (2) Issue solving capability
	2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).	(1) Basic knowledge of the scope of works (functions) (2) Capability for development of the scope of work(function)
	2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division).	(1) Basic knowledge of work description (2) Capability for development of work description
	2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.	(1) Basic knowledge of a) Operational terms of reference b) Terms of reference for staffing (2) Capability for development of rules for operation and management of Fare Management Center

The first baseline survey was conducted in April 2018 to measure the current knowledge and skills level. The average scores are shown in the following table.

**Table 13 Average Score for each Output**

Time	Output 1: development of DG/TS for interoperable smart card system	Output 2: development of Organizational TOR of each unit of the FMC
When the Project launched (April 2018)	2.49	3.33
When basic policy was formulated (December 2018)	3.03	3.67
When draft DG/TS and draft TOR of FMC (October 2019)	3.56	4.00

### 1.5 Changes of Risks and Actions for Mitigation

N/A

### 1.6 Progress of Actions undertaken by JICA

N/A

### 1.7 Progress of Actions undertaken by The People's Committee of Hanoi

N/A

**1.8 Progress of Environmental and Social Considerations (if applicable)**

N/A

**1.9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)**

N/A

**1.10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)**

Project is implemented in the context of many movements/fluctuations. Such as Line 2A, Line 3 in the completion process, pilot smart card on BRT Line... Especially, Hanoi started to develop a smart city... They create new several requirements for Project.

**1.11 Tasks to be implemented by JICA Project Team and Counterparts**

Work	Tasks	Implementing agencies
Output 1: 'Design Guideline and Specifications' for interoperable smart card system are developed		
N/A	N/A	N/A
Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.		
N/A	N/A	N/A

**2 Delay of Work Schedule and/or Problems (if any)**

**2.1 Cause**

**(1) Delay in assignment of counterparts**

In the 1st Joint Coordination Committee (JCC) meeting, it was agreed that WG members would be assigned in February 2018. However, the members were actually determined in 29 March 2018 (Decision No. 341/QD-SGTVT).

**(2) Delay caused by comparative study between CBT and ABT**

In compliance with Decision 3978/QD-UBND, the Project Team submitted to HDOT the outline of DG/TS based on the card-based ticketing (CBT) system. This outline of DG/TS underwent the approval process. Although this Project is based on the assumption of adopting the CBT system, Hanoi City proposed to Japan International Cooperation Agency (JICA) to consider account-based ticketing (ABT) system with a perspective of the smart city concept. This led to comparative study between the CBT and ABT systems, which concluded application of the CBT system. The outline of DG/TS was finally approved in 26 April 2019, three months after the submission.

**(3) COVID-19**

Global pandemic of the COVID-19 caused a serious impact on the project implementation, especially preventing Japanese experts from working in Hanoi.

## **2.2 Action to be taken**

### **(1) Assignment of counterparts**

In spite of the delay in assignment of WG members at the start of this Project, they actively involved themselves in the Project, including approximately 190 WG meetings. Moreover, participation of IT companies in Hanoi was approved at 4<sup>th</sup> JCC held in 29 August 2019, which allowed members familiar with IT in Hanoi to join the WGs, contributing to formulating the DG/TS based on the actual situation of the city. Director and Vice Director of HDOT, and director of Hanoi Urban Transport Management and Operation Center (TRAMOC) also take active part in the project, closely communicating with the Project Team.

### **(2) Comparative study between CBT and ABT**

A study meeting was held in 19 April 2019 chaired by Chairman of HPC. As a result, it was decided to continue the Project based on the submitted outline of DG/TS. This outline was approved in 26 April 2019 (HPC letter No. 1648/UBND-DT).

### **(3) COVID-19**

As Japanese experts were not able to visit Hanoi since February 2020, online meetings were held to ensure quality of the Project.

## **2.3 Roles of Responsible Persons/Organization (JICA, The People's Committee of Hanoi, etc.)**

N/A

## **3 Modification of the Project Implementation Plan**

### **3.1 PO**

### **3.2 Other modifications on detailed implementation plan**

## **II. Project Monitoring Sheet I & II** *as Attached*



**Project Monitoring Sheet I (Project Design Matrix)**

**Version 6**

**Project title:** Project for Supporting Development of Interoperable Smart Card System for Public Transportation in Hanoi

**Dated. 5 June 2020**

**Project Area:** Hanoi

**Target Group:** Hanoi People's Committee (HPC) and organizations related to public transportation in Hanoi

**Counterpart:** HPC (Hanoi Department of Transport (DOT), Hanoi Department of Science and Technology (DOST), Hanoi Department of Information and Communication (DOIC), Hanoi Metro Company (HMC), Hanoi Transport Corporation (TRANSERCO))

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption	Achievement	Remarks
<b>Overall Goal</b>					
Interoperable smart card systems are developed for the public transportation in Hanoi	<ul style="list-style-type: none"> <li>Number of public transport operators applying the 'Design Guideline and Specifications' developed under the Project to realize interoperable smart card system.</li> <li>Ratio of satisfaction on interoperable smart card is more than XX%.</li> </ul>	Survey report(s)			
<b>Project Purpose</b>					
Technical and management capacities of counterpart agencies under HPC are improved for the development of interoperable smart card system for public transportation in Hanoi	<ul style="list-style-type: none"> <li>'Design Guideline and Specifications' are approved by HPC.</li> <li>The public transport fare policy is established.</li> </ul>	<ul style="list-style-type: none"> <li>Approved 'Design Guideline and Specifications'</li> <li>Project progress report</li> </ul>	Decision no. 3978/QD-UBND dated 13 August 2015 on use of interoperable smart card in public transportation in Hanoi continues to be effective.		
<b>Outputs</b>					
1. 'Design Guideline and Specifications' for interoperable smart card system are developed.	'Design Guideline and Specifications' are finalized.	'Design Guideline and Specifications' (final version)	HPC reviews policy/documents developed under the Project in a timely manner.		
2. Organization terms of reference of each unit of the Fare Management Center (Division) are developed.	Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval.	Organizational terms of reference for the Fare Management Center (Division) (draft for approval)			

Activities	Input		Pre-conditions
	Japanese Side	Vietnamese Side	
1-1. Collect and analyze information on the existing and approved smart card systems for the public transportation system in Hanoi	1. Japanese Experts - Leader - Public Transport Fare Policy and System - Interoperable Smart Card System - Communication System - Fare Management System	1. Project Counterparts (1) HPC (2) HDOT - Road Transportation Management Division - Planning and Investment Division - Economics planning Division - TRAMOC (3) DOST (4) DOIC (5) HMC (6) TRANSERCO 2. Provision of Office Space and equipment 3. Cost for - counterpart members - office operation and maintenance - others (local travel expenses excluding airfare for Vietnamese side, etc.)	Official request to apply for Japan's ODA Loan Project.
1-2. Prepare an outline of 'Design Guideline and Specifications' and fare policy  1) Examination of fare ticket specifications for interoperable use 2) Examination of fare system rules for interoperable use 3) Examination of the operation rules 4) Examination of the technical specifications	2. Counterpart Training in Japan 3. Seminar and workshop 4. Other cost - Local experts and consultants - Local staff - Others (survey, card rental, etc.)		
1-3. Consult with the relevant authorities and finalize the outline of the 'Design Guideline and Specifications' and fare policy			
1-4. Draft a 'Design Guideline and Specifications' with fare policy			
1-5. Consult with the relevant authorities and finalize the 'Design Guideline and Specifications'			
1-6. Conduct seminar(s) to introduce the draft 'Design Guideline Specifications' and fare policy			
2-1. Define the scope of work to be performed by the proposed Fare Management Center (Division)  1) Conduct a survey of relevant laws and regulations 2) Define the scope of work of the fare management center (division)			
2-2. Define the tasks and responsibilities of departments/division under the Fare Management Center (Division)			
2-3. Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division)			
2-4. Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.  1) Prepare a TOR 2) Organizational structure and staff requirements			



## PROJECT MONITORING SHEET

**Project Title:** The Project for Supporting Development of Interoperable Smart Card System for Public Transport in Hanoi

**Version of the Sheet:** Ver. 7 (Term: 2017 - 2020)

**Name:** Mr. Michimasa TAKAGI

**Title:** Team Leader/ Urban Public Transport

**Submission Date:** December 2020

### I. Summary

#### 1 Progress

This monitoring sheet covers the period from project commencement in **December 2017** up to **the end of November 2020**.

#### 1.1 Progress of Inputs

##### 1.1.1 Experts

**Table 1: Input of Experts as of End-July**

Designation	Name	No. of PMs
Team Leader/ Urban Public Transport	M. TAKAGI	7.83
Deputy Team Leader/ AFC Technical Management	T. OTSUKI	9.93
Public Transport Fare Policy [Railway]	S. HORIUCHI	2.92
Public Transport Fare Policy [Railway]	R. SAITO	2.25
Public Transport Fare Policy [Bus]	T. KUMAI	2.83
Interoperable Smart Card Plan	T. UMEKAWA	0.97
Smart Card Data Management and Utilization	N. MIZOGUCHI	0.00
Interoperable Smart Card System [Railway]	T. FUKATSU	4.62
Interoperable Smart Card System [Bus]1	A. TANAKA	3.22
Interoperable Smart Card System [Bus]2	H. MIYAHARA	2.85
Communication System	K. HONDA	3.40
Fare Management System [AFC Technical Specification]	H. KUWANO	0.57

Fare Management System [AFC Technical Specification]1	Y. WATABE	9.47
Fare Management System [AFC Technical Specification]2	K. HIRAMATSU	0.00
Fare Management system [AFC Host System]	Y. SAKAMOTO	1.50
Organization Institution	A. SAKUMA	1.50
Monitoring/ Training in Japan/ Coordination	M. OHNO	7.68
TOTAL PMs		61.54 (92.8%)
Planned PMs		66.30

## 1.2 Progress of Activities

### 1.2.1 Joint Coordinating Committee and Working Group Meetings

Four Joint Coordinating Committee (JCC) meetings and several working group (WG) meetings were held during the period.

**Table 2: Joint Coordinating Committee and Working Group Meetings**

#### Joint Coordination Committee Meeting

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
1	First JCC meeting	2 February 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Outline of Work Plan (Draft) 2) Confirmation of the Undertakings by Vietnamese Side
2	Second JCC Meeting	22 August 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Progress of the project 2) Proposal from WG 3) Items to be confirmed by Hanoi-city 4) Activity plans
3	Third JCC Meeting	7 November 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Achievements in the 1st Year 2) Explanation for Outline of 'Design Guideline and Specifications 'and Fare Policy 3) Activities in Next Period
4	Fourth JCC Meeting	29 August 2019	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Report about Project Implementation 2) Remaining Items 3) Plan/Procedure to obtain appraisal, approval on Design Guidelines and Technical Specifications 4) Proposal on AFC system implementation under the city bus network (applying Project outputs) 5) Proposal about Project extension

#### Meeting among WGs/Meeting with Originations

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
1	1st WG Leader Meeting	23 August 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Ideal AFC Model in Hanoi 2) Confirmation of 2nd JCC

PM Form 3-1 Monitoring Sheet Summary

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
2	2nd WG Leader Meeting	4 December 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Progress of the project since last JCC meeting 2) Response to the notice by HPC 3) Confirmation of the materials and preparations for the seminar
3	3rd WG Leader Meeting	6 December 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Reflection of the seminar for the formulation of Outline Report 2) Site Visit at TRAMOC (Bus Operator) Demo for Bus unit
4	JICA-JET meeting for the fourth JCC meeting	23 August 2019	JICA Headquarters, JICA Viet Nam Office, JICA Expert Team	1) Topics and materials in JCC meeting
5	Inter-Working Group Meeting	29 August 2019	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Transfer discount 2) Valid period of season passes
6	Inter-Working Group Meeting (JET only)	3 October 2019	JICA Expert Team	1) Confirmation of draft DG/TS
7	Inter-Working Group Meeting	3 October 2019	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Confirmation of remaining items
8	Orientation Meeting	4 October 2019	JICA Headquarters, JICA Viet Nam Office, JICA Expert Team	1) Confirmation on how to develop outputs and schedule
9	General Meeting with JICA	7th October 2019	JICA Headquarters, JICA Expert Team	1) Contents of outputs and the seminar
10	Inter-Working Group Meeting (JET only)	27th November 2019	JICA Expert Team	1) Review of the seminar and orientation
11	Meeting with HDOT	29th November 2019	HDOT, JICA Expert Team	1) Schedule of the project
12	Meeting with HDOT and TRAMOC	25th December 2019	HDOT, TRAMOC, JICA Expert Team	1) Schedule of the project 2) Confirmation on remaining items 3) Training in Japan
13	Meeting at Ho Chi Minh City	16th January 2020	HCMC-DOT, MAUR, HCMC-Metro, JICA, WB, NJPT, JICA Expert Team	1) Opinion exchange about interoperable use of IC card
14	JET Meeting	13th February 2020	JICA Expert Team	1) Confirmation of revision policy of the DG/TS
15	Meeting with HDOT	12th August 2020	HDOT, JICA Expert Team	1) Revision of RD, project schedule, etc. caused by change in project period
16	Inter-Working Group Meeting (JET only)	1st September 2020	JICA Expert Team	1) Confirmation of revision of the DG/TS by each Working Group 2) Confirmation on topics to be discussed among WGs 3) Confirmation on schedule

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
17	WG1-WG3 meeting (JET only)	3rd September 2020	WG1 and WG3 members of JICA Expert Team	1) Confirmation on how to deal with the case where passengers alight buses without tapping their IC cards
18	WG1-WG3 meeting (JET only)	15th September 2020	WG1 and WG3 members of JICA Expert Team	1) Final confirmation on revised parts of the DG/TS

## Seminar

No.	Meetings Conducted	Date	Participated Agency	Key Agenda
1	1st Seminar	5 December 2018	HDOT, HDOST, HDOIC, HAPI, TRANSERCO, TRAMOC, JICA Expert Team	1) Project Overview and Introduction of Basic Approach on Interoperable Smart Card System for Public Transportation in Hanoi
2	2nd Seminar	27th November 2019	HDOT, HDOF, HDOST, HDOIC, SBV, HMC, TRANSERCO, MOT, TRAMOC. Construction Association, BIDV, IT Agribank, Vietcombank, Viettel, MK Group, ITD, VNPT, NAPAS, ADB, WB, ABeam Consulting (Vietnam), Viet Nam Tokyo Metro, TOPPAN FORMS, Sony Imaging Products & Solutions, Sony Electronics Vietnam, JCB International	1) Overview of the draft DG/TS

## Working Group 1 Meeting

No.	Date	Subject
1	16th Apr, 2018	<ul style="list-style-type: none"> <li>Outline of the expected output of WG1</li> <li>Confirmation of the activity schedule</li> </ul>
2	29rd May, 2018	<ul style="list-style-type: none"> <li>Explanation of the Fare Management System in Japan</li> </ul>
3	30th May, 2018	<ul style="list-style-type: none"> <li>Discussion on the feasibility to install each system into Hanoi</li> </ul>
4	5th Jun, 2018	<ul style="list-style-type: none"> <li>Explanation of the Fare Management System in other countries</li> </ul>
5	25th Jul, 2018	<ul style="list-style-type: none"> <li>Clarification of the items to be discussed</li> <li>Discussion on the reporting to the 2nd JCC</li> </ul>
6	19th Sep, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents of outline report</li> </ul>
7	20th Sep, 2018	<ul style="list-style-type: none"> <li>Explanation of transfer discount in other countries</li> </ul>
8	28th Nov, 2018	<ul style="list-style-type: none"> <li>Confirmation of the contents of seminar</li> <li>Confirmation of items to be discussed in the upcoming WG1</li> </ul>
9	7th Dec, 2018	<ul style="list-style-type: none"> <li>Confirmation of distance-based fare</li> <li>Discussion on ticket type</li> </ul>

10	14th Jan, 2019	• Discussion on the way of transfer discount
11	17th Jan, 2019	• Discussion on ticket types and information on card surface
12	22nd Jan, 2019	• Confirmation of the result of discussion and table of contents of the output
13	26th Feb, 2019	• Confirmation of contents of fare system guideline (proposed)
14	14th Mar, 2019	• Confirmation of the comment from Vietnamese side against fare system guideline (proposed)
15	20th Mar, 2019	• Reconfirmation of the whole structure of outputs in line with the work plan • Confirmation of the tasks from April
16	25th Mar, 2019	• Confirmation of the response toward the comments from Vietnamese side against fare system guideline (proposed)
17	13rd Jun, 2019	• Discussion on how to deal with fare system guideline
18	18th Jun, 2019	• Leader meeting with Mr. Binh (vice director of TRAMOC)
19	16th Jul, 2019	• Discussion on how to deal with fare system guideline
20	23rd Aug, 2019	• Discussion on how to deal with fare system guideline
21	4th Oct, 2019	• Discussion and Confirmation on draft technical cooperation outputs
22	24th Oct, 2019	• Confirmation on outputs with WG3 (JICA Expert Team only)
23	31st Oct, 2019	• Arrangement and material of the seminar (JICA Expert Team only)
24	25th Nov, 2019	• Discussion on contents of the seminar
25	20th Aug, 2020	• Confirmation on revision policy of the DG/TS and schedule
26	26th Aug, 2020	• Confirmation on draft revision of the DG/TS and schedule

### Working Group 2 Meeting

No.	Date	Subject
1	12th Apr, 2018	• Procedure on WG2 activities "Development of Operational Specification" • Explanation of the draft proposal of the list of Operational Specification • Outline of the expected final output of WG2 • Confirmation of the activity schedule
2	13rd Apr, 2018	• Outline of the expected final output of the Operational Specification • Confirmation of the activity schedule
3	30th May, 2018	• Explanation of the draft proposal of the list of Operational Specification • Re-issue and re-issue registration (Assignment) • Card life cycle
4	31st May, 2018	• Boarding and Alighting from railway, BRT and bus
5	21st June, 2018	• Discussion on the Operational Specification
6	5th July, 2018	• Interview about operation of railway, BRT and bus
7	21st Aug, 2018	• Confirmation of the contents of outline report
8	6th Nov, 2018	• Discussion on the operational flow in the use of interoperable IC card
9	8th Nov, 2018	• Discussion on the operational flow in the use of interoperable IC card
10	4th Dec, 2018	• Discussion on the operational flow in the use of interoperable IC card
11	18th Dec, 2018	• Discussion on the operational flow in the use of interoperable IC card
12	22nd Jan, 2019	• Discussion on the operational flow in the use of interoperable IC card
13	24th Jan, 2019	• Discussion on the operational flow in the use of interoperable IC card
14	26th Mar, 2019	• Discussion on the operational flow in the use of interoperable IC card
15	29th May, 2019	• Discussion on the operational flow in the use of interoperable IC card
16	26th Jun, 2019	• Discussion on the operational flow in the use of interoperable IC card

No.	Date	Subject
17	24th Jul, 2019	• Discussion on the operational flow in the use of interoperable IC card
18	28th Aug, 2019	• Discussion on the operational flow in the use of interoperable IC card
19	30th Oct, 2019	• Discussion on the DG/TS regarding the use of interoperable IC card
20	31st Oct, 2019	• Discussion on the DG/TS regarding the use of interoperable IC card
21	26th Nov, 2019	• Discussion on contents of the seminar
22	19th Dec, 2019	• Discussion on the fare deduction method
23	14th Jan, 2020	• Discussion on the fare deduction method
24	27th Aug, 2020	• Discussion on revision policy of the DG/TS and schedule
25	22th Sep, 2020	• Confirmation on revision of the WG2 documents via email

### Working Group 3 Meeting

No	Date	Subject
1	12th Apr, 2018	• Discussion on WG3 activity planning <ul style="list-style-type: none"> <li>➢ Confirmation on WBS, operation plan</li> <li>➢ Sharing the target deliverables of WG3 (AFC technical specification)</li> <li>➢ Review on AFC system interoperable use</li> </ul>
2	13th Apr, 2018	• Lecture for understanding of AFC system, basic terms and structure • Review and discussion on Hanoi AFC technical framework (3978) from interoperable perspective.
3	21st May, 2018	• Explanation of AFC survey report on public transportation interoperability in Hanoi City. (BRT, Line2A, Line3, laws and regulations) • Review on overview on AFC technical specification and IC card issuance process • Procedure on WG3 activities and planning for upcoming 3 months
4	22nd May, 2018	• Understanding of AFC technical specification <ul style="list-style-type: none"> <li>➢ Explanation and discussion on each AFC technical specification item. (ticket media, R/W, Smartcard IC format, encoding process/format, common code, ticket validation, transaction data and set value, black list, trip pattern, host system)</li> </ul>
5	23rd May, 2018	
6	24th May, 2018	
7	25th May, 2018	
8	28th May, 2018	
9	29th May, 2018	
10	30th May, 2018	
11	4th June, 2018	• Review of proposal of FMC by TRAMOC (2015):
12	8th June, 2018	• Framework of Technical Specification for Host System
13	11th June, 2018	• Clarification key points of AFC interoperable technical specification for Hanoi <ul style="list-style-type: none"> <li>➢ Acquire the important key point for AFC technical specification to be introduced in Hanoi city</li> <li>➢ Listing up the discussion items with other WGs.</li> </ul>
14	13th June, 2018	
15	15th June, 2018	
16	19th June, 2018	
17	26th June, 2018	
18	27th June, 2018	
19	29th June, 2018	
20	4th July, 2018	



No	Date	Subject
21	27th June, 2018	<ul style="list-style-type: none"> <li>• MK smart factory visit for IC card manufacturing tour and study on interoperable bus R/W.</li> </ul>
22	19th July, 2018	<ul style="list-style-type: none"> <li>• Review of Drafted outline of AFC technical specification.</li> </ul>
23	23rd July, 2018	<ul style="list-style-type: none"> <li>➢ Create and review draft version of outline of AFC technical specification.</li> </ul>
24	23rd July, 2018	<ul style="list-style-type: none"> <li>• Visit to HMC <ul style="list-style-type: none"> <li>➢ Technical Information of Line 2A</li> <li>➢ Communication with HMC</li> </ul> </li> </ul>
25	24th July, 2018	<ul style="list-style-type: none"> <li>• Review of Drafted outline of AFC technical specification.</li> </ul>
26	31st July, 2018	<ul style="list-style-type: none"> <li>• Review of BRT document from Viettel (rev3.2)</li> </ul>
27	31st July, 2018	<ul style="list-style-type: none"> <li>• Review Host system of Drafted outlines of Technical Specification (ver. 0.12)</li> </ul>
28	24th July, 2018	<ul style="list-style-type: none"> <li>• Review BRT AFC document from Viettel</li> </ul>
29	27th July, 2018	<ul style="list-style-type: none"> <li>• On site review of demonstration of AFC system for pilot test and confirmation of technical details with Transerco-Viettel BRT project members</li> </ul>
30	8th Aug, 2018	<ul style="list-style-type: none"> <li>• Review on summary of main point discussed and Study of coping plan</li> </ul>
31	10th Aug, 2018	<ul style="list-style-type: none"> <li>• Joint meeting with WG1, WG2 and WG4 to shaping consensus on main point discussed proposed by WG3</li> </ul>
32	14th Aug, 2018	
33	16th Aug, 2018	
34	21st Aug, 2018	<ul style="list-style-type: none"> <li>• Confirmation of the contents to be reported in JCC (Discussion on role sharing in formulation of the technical specifications)</li> </ul>
35	24th Aug, 2018	<ul style="list-style-type: none"> <li>• Discussion on host system specifications</li> </ul>
36	7th Sep, 2018	<ul style="list-style-type: none"> <li>• Discussion on contents and sharing of work between Japanese and Vietnamese sides in formulation of the technical specifications (common code)</li> </ul>
37	3rd Oct, 2018	<ul style="list-style-type: none"> <li>• Discussion on common code</li> </ul>
38	5th Oct, 2018	<ul style="list-style-type: none"> <li>• Discussion on common code and Blacklist</li> </ul>
39	5th Nov, 2018	<ul style="list-style-type: none"> <li>• Site visit at depots of three local bus company(1). Investigation was conducted in terms of infrastructure related to system and network and amount of data to be dealt with at each depot, for the purpose of establishment of AFC system suitable for the actual bus operation. : Nam Ha Noi Bus company,</li> </ul>
40	5th Nov, 2018	<ul style="list-style-type: none"> <li>• Site visit at depots of three local bus companies(2): Cau Buou bus company (142 bus, 11 line)</li> </ul>
41	5th Nov, 2018	<ul style="list-style-type: none"> <li>• Site visit at depots of three local bus company (3): Tan Dat bus company (68 bus, 5 line))</li> </ul>
42	6th Nov, 2018	<ul style="list-style-type: none"> <li>• Confirmation of contents of JCC meeting</li> <li>• Discussion on technical specifications (Ticket media)</li> </ul>
43	8th Nov, 2018	<ul style="list-style-type: none"> <li>• Discussion on proposed AFC system structure suitable for bus services</li> </ul>
44	9th Nov, 2018	<ul style="list-style-type: none"> <li>• Site visit at Line 2A. Inspection of installed AFC facility, IC card and operation, and investigation for tasks to be tackled for formulation of common specifications are conducted.</li> <li>• Survey of actual AFC trial operation in BRT</li> </ul>
45	9th Nov, 2018	<ul style="list-style-type: none"> <li>• Discussion on JCC 3rd result in WG3</li> </ul>
46	20th Nov, 2018	<ul style="list-style-type: none"> <li>• Discussion on common code and gate access log</li> </ul>

PM Form 3-1 Monitoring Sheet Summary

No	Date	Subject
47	28th Nov, 2018	<ul style="list-style-type: none"> <li>Discussion on specifications for common code, which is used to process data in interoperable use</li> </ul>
48	7th Dec, 2018	<ul style="list-style-type: none"> <li>Technical Specifications (discussion on encode format)</li> </ul>
49	17th Dec, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
50	19th Dec, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
51	21st Dec, 2018	<ul style="list-style-type: none"> <li>Technical Specifications (discussion on encode format)</li> </ul>
52	25th Dec, 2018	<ul style="list-style-type: none"> <li>Discussion on the contents of outline report</li> </ul>
53	11th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (common code, format)</li> </ul>
54	16th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (reader/writer)</li> </ul>
55	17th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (encode process)</li> </ul>
56	22nd Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (trip pattern)</li> </ul>
57	24th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion through Skype on technical Specifications (host system)</li> </ul>
58	28th Jan, 2019	<ul style="list-style-type: none"> <li>Discussion on schedule of further WG3 activities</li> </ul>
59	19th Feb, 2019	<ul style="list-style-type: none"> <li>Discussion on installation of IC card in buses with TRANSERCO</li> </ul>
60	20th Feb, 2019	<ul style="list-style-type: none"> <li>Discussion on work plan and role sharing in 2019</li> <li>Confirmation of list of tasks and role sharing in formulation of technical specifications</li> </ul>
61	20th Feb, 2019	<ul style="list-style-type: none"> <li>Review of project with Mr.Hai (extension of project and other discussions)</li> </ul>
62	20th Feb, 2019	<ul style="list-style-type: none"> <li>Interview with NAPAS about how to apply IC card to other transport</li> <li>Discussion with Ms. Huong on tasks and solutions in the process of project</li> </ul>
63	17th Apr, 2019	<ul style="list-style-type: none"> <li>Site visit at Payoo Corporation to survey the situation of Fintech, which is used for ABT system</li> <li>Site visit at pilot trial at Ho Chi Minh bus, in which ABT system is installed (create an account of ZaloPay, apply for UniPass, issue IC card, take a bus)</li> <li>Sharing opinion with iTD Company, one of the most promising IT company in Vietnam, about ABT and CBT in the structure of AFC system</li> </ul>
64	19th Apr, 2019	<ul style="list-style-type: none"> <li>Discussion with Vietnamese members about the main text of technical specifications                             <ul style="list-style-type: none"> <li>➢ Confirmation of progress in outline (to be tackled after conclusion of HPC meeting)</li> </ul> </li> </ul>
65	22nd Apr, 2019	<ul style="list-style-type: none"> <li>Discussion with Vietnamese members about the main text of technical specifications                             <ul style="list-style-type: none"> <li>➢ Confirmation of items, schedule and role sharing</li> <li>➢ Vietnamese side raised a problem in lack of resources to be used for contents confirmation</li> </ul> </li> </ul>
66	24th Apr, 2019	<ul style="list-style-type: none"> <li>Sharing opinion with R&amp;D sector, NAPAS</li> </ul>
67	28th May, 2019	<ul style="list-style-type: none"> <li>Detailed review of specifications for common code</li> </ul>
68	30th May, 2019	<ul style="list-style-type: none"> <li>Detailed review of specifications for common code</li> </ul>
69	4th June, 2019	<ul style="list-style-type: none"> <li>Detailed review of specifications for common code and Encode Format</li> </ul>
70	6th June, 2019	<ul style="list-style-type: none"> <li>Detailed review of specifications for Encode Format</li> </ul>
71	11th June, 2019	<ul style="list-style-type: none"> <li>Detailed review of specifications for Encode Format</li> </ul>
72	13th June, 2019	<ul style="list-style-type: none"> <li>Detailed review of specifications for Ticket Media</li> </ul>
73	18th June, 2019	<ul style="list-style-type: none"> <li>Detailed review of specifications for R/W and Ticket Validation</li> </ul>
74	20th June, 2019	<ul style="list-style-type: none"> <li>Detailed review of specifications for Ticket Validation</li> </ul>
75	2nd July, 2019	<ul style="list-style-type: none"> <li>Detailed review of specifications for Ticket Validation</li> </ul>

No	Date	Subject
76	4th July, 2019	• Detailed review of specifications for Ticket Validation
77	9th July, 2019	• Detailed review of specifications for Encode Data
78	18th July, 2019	• Detailed review of specifications for Encode Data
79	23rd July, 2019	• Detailed review of specifications for Encode Data
80	25th July, 2019	• Detailed review of specifications for Encode Data
81	30th July, 2019	• Detailed review of specifications for Encode Data
82	6th Aug, 2019	• Detailed review of specifications for Transaction Data
83	8th Aug, 2019	• Detailed review of specifications for Transaction Data
84	20th Aug, 2019	• Detailed review of specifications (Station code) on request of Hanoi member
85	22th Aug, 2019	• Detailed review of specifications (Station code) on request of Hanoi member
86	27th Aug, 2019	• Detailed review of specifications for Transaction Data and Trip Pattern
87	10th Sep, 2019	• Discussion on project planning
88	10th Sep, 2019	• Detailed review of specifications for Host System and Trip Pattern
89	12th Sep, 2019	• Detailed review of specifications for Trip Pattern
90	17th Sep, 2019	• Detailed review of specifications for Trip Pattern
91	19th Sep, 2019	• Explanation contents and structure of Main report
92	24th Sep, 2019	• Review report of Host System
93	1st Oct, 2019	• Discussion on bus stop code
94	3rd Oct, 2019	• Review main report of WG3
95	15th Oct, 2019	• Pre-discussion on bus stop code (JICA Expert Meeting only)
96	17th Oct, 2019	• Discussion on bus stop code
97	5th Nov, 2019	• Discussion on contents of the seminar in WG3
98	12th Nov, 2019	• Preparation and review on seminar material
99	26th Nov, 2019	• Rehearsal of the seminar and check of the contents
100	26th Dec, 2019	• Bus stop code structure and confirmation on reflection of the comments at the seminar
101	18th Aug, 2020	• Confirmation on revision of the DG/TS (revised parts, basic concept)
102	20th Aug, 2020	• Confirmation on revised contents of the DG/TS (confirmation on involved member in the revision and schedule with Ms. Huong (HDOT))
103	27th Aug, 2020	• Confirmation on revised contents of the DG/TS (encode format and ticket validation)
104	3rd Sep, 2020	• Confirmation on revised contents of the DG/TS (encode data)
105	10th Sep, 2020	• Confirmation on revised contents of the DG/TS (transaction data format and transaction data encode)
106	17th Sep, 2020	• Confirmation on revised contents of the DG/TS (trip pattern)
107	24th Sep, 2020	• Confirmation on revised contents of the DG/TS (main body of the DG/TS) • Q&A about the DG/TS

### Working Group 4 Meeting

No.	Date	Subject
1	21st Aug, 2018	• Confirmation of contents of outline report
2	5th Nov, 2018	• Discussion on organizational structure and staffing requirements under FMC
3	6th Dec, 2018	• Discussion on organizational structure and staffing requirements under FMC

4	19th Dec, 2018	• Discussion on organizational structure and staffing requirements under FMC
5	21st Dec, 2018	• Discussion on contents of outline report
6	23rd Jan, 2019	• Discussion on organizational structure and staffing requirements under FMC
7	27th Mar, 2019	• Discussion on organizational structure and staffing requirements under FMC
8	30th May, 2019	• Discussion on organizational structure and staffing requirements under FMC
9	27th Jun, 2019	• Discussion on terms of reference detailing the specific tasks and responsibilities of each unit under FMC
10	25th Jul, 2019	• Discussion on terms of reference detailing the specific tasks and responsibilities of each unit under FMC
11	28th Aug, 2019	• Discussion on staffing requirement of FMC
12	26th Sep, 2019	• Discussion on staffing requirement of FMC
13	19th Dec, 2019	• Confirmation on Organizational TOR of FMC

### 1.2.2 Output 1: 'Design Guideline and Specifications' for interoperable smart card system are developed.

The progress of Output 1 activities is shown in the table below.

**Table 7: Progress of Output 1 Activities**

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system including MRT, BRT and Bus in Hanoi	Collect the legal documents related to the transportation smart card system as follows;; ✓ Legal systems and standards on smart card system/ transportation smart card system ✓ Design documents of smart card system ✓ International standards for interoperable AFC system ✓ MRT 2A, 3: AFC technical design ✓ MRT 2: AFC technical specifications ✓ BRT1, Route Bus: Specifications and planning documents to introduce ✓ Hanoi City and MOT: Legal system and decision about technical standardization of AFC ✓ Central Bank: Decision, regulations, standard regarding smart card and electric money	- Done	- No activity (N/A)

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
1-2 Prepare an outline of 'Design Guideline and Specifications' and the fare policy	1) Examination of ticket specifications for interoperable use 2) Examination of fare system rules for interoperable use 3) Examination of the operational specifications 4) Examination of the technical specifications	- Done	- No activity (N/A)
1-3 Consult with the relevant authorities and finalize the concepts of the 'Design Guideline and Specifications' and the fare policy.	-	- Done	- No activity (N/A)
1-4 Preparation of the drafts of the 'Design Guideline and Specifications' and the fare policy	-	- The Project Team revised DG/TS to alter the timing of fare deduction at "boarding" instead of "alighting", and submitted the draft of DG/TS (Version 3) on 14 <sup>th</sup> October 2020.	- HDOT shall collect comments until December 2020. Reflect reasonable comments in DG/TS and submit DG/TS-Final Draft in late January.
1-5 Consult with the relevant authorities and finalize the 'Design Guideline and Specifications' and the fare policy	-	- On going	- To be completed in late January.
1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.	- The 1 <sup>st</sup> Seminar was held on 5 December 2018. - The 2 <sup>nd</sup> Seminar was held on 27 November 2019.	- Done	- No activity (N/A)

**1.2.3 Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.**

The progress of Output 2 activities is shown in the table below.

**Table 8: Progress of Output 2 Activities**

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	1) Conduct a survey of relevant laws and regulations 2) Define the scope of work of the Fare Management Center (division)	- Done	- No activity (N/A)

Activity and Work Item	Activities	Progress	Activity for the Next 6 Months
2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).	Define the basic six items of operational terms of reference of FMC	- Completed the Draft.	- Continue discussion for final version
2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division).	-	- To be done soon.	- Continue discussion for final version
2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.	1) Prepare a TOR 2) Organizational structure and staff requirements	- On going	- To be completed in late January.

### 1.3 Achievement of Output

#### 1.3.1 Output 1

Achievement status of Output 1 is as follows.

**Table 9: Verifiable Indicators and Current Status**

Objectively Verifiable Indicator	Baseline	Current Status
The Design Guideline and Specification is prepared.	None	On going

Source: PDM 1.1

#### 1.3.2 Output 2

Achievement status of Output 2 is as follows.

**Table 10: Verifiable Indicators and Current Status**

Objectively Verifiable Indicator	Baseline	Current Status
Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval	None	On going

Source: PDM 1.1

#### 1.4 Achievement of the Project Purpose

Also stated in PDM, the achievement of the project purpose shall be evaluated using verifiable indicators.

**Table 11: Verifiable Indicators and Current Status**

Objectively verifiable indicators	Baseline	Current Status
- 'Design Guideline and Technical Specifications' are approved by HPC	None	On going
- The public transport fare policy is established	None	On going

Source: PDM 1.1

To achieve the project purpose, the JICA Project Team (JPT) identify the required knowledge and skills by each output shown in the following table. Result of the baseline survey were evaluated on a five-level scale as indicated below and illustrated in following figures.

- (1) Newbie: I don't know the process/ concept;
- (2) Novice: I know the process/ concept, but I have never done it;
- (3) Young Expert: I have done it once, but I have not reported or presented the results;
- (4) Expert: I have done it twice or more/ I have done it once and reported or presented the results;  
and
- (5) Senior Expert: I have done it twice or more, and reported or presented the results.

**Table 12 Required Knowledge and Skills per Project Output and Activity**

Expected Output	Activities	Required Knowledge & Skills
(1) The 'Design Guideline and Specification' is prepared.	1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system including MRT, BRT and Bus in Hanoi	Information collection capability, Issue solving capability
	1-2 Prepare of outline of 'Design Guideline and Specifications' and the fare policy	(1) Basic knowledge of a) Ticket specifications, b) Fare system c) Operation system d) Technical specification e) Host system  (2) Capability for development of a) Rules for common ticket b) Rules for fare c) Rules for operation specification d) Rules for technology implementing specification e) Host system specification
	1-3 Consult with the relevant authorities and finalize the concepts of the 'Design Guideline and Specifications' and the fare policy.	
	1-4 Preparation of the drafts of the 'Design Guideline and Specifications' and the fare policy	
	1-5 Consult with the relevant authorities and finalize the 'Design Guideline and Specifications' and the fare policy	
	1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.	
(2) Organizational terms of reference for the proposed	2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	

Expected Output	Activities	Required Knowledge & Skills
Fare Management Center (Division) is drafted and submitted for approval	2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).	(1) Basic knowledge of the scope of works (functions) (2) Capability for development of the scope of work(function)
	2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division).	(1) Basic knowledge of work description (2) Capability for development of work description
	2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.	(1) Basic knowledge of a) Operational terms of reference b) Terms of reference for staffing (2) Capability for development of rules for operation and management of Fare Management Center

The first baseline survey was conducted in April 2018 to measure the current knowledge and skills level. The average scores are shown in the following table.

**Table 13 Average Score for each Output**

Time	Output 1: development of DG/TS for interoperable smart card system	Output 2: development of Organizational TOR of each unit of the FMC
When the Project launched (April 2018)	2.49	3.33
When basic policy was formulated (December 2018)	3.03	3.67
When draft DG/TS and draft TOR of FMC (October 2019)	3.56	4.00
When the Project completed (November 2020)	4.01	4.67



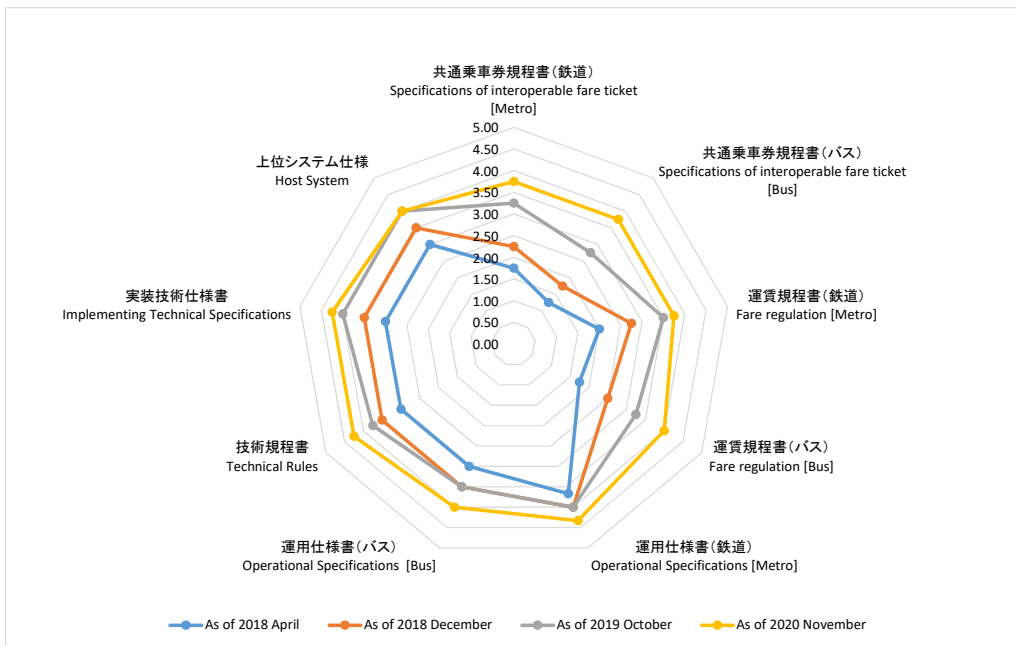


Figure 1 Necessary Knowledge and Skills for Output 1

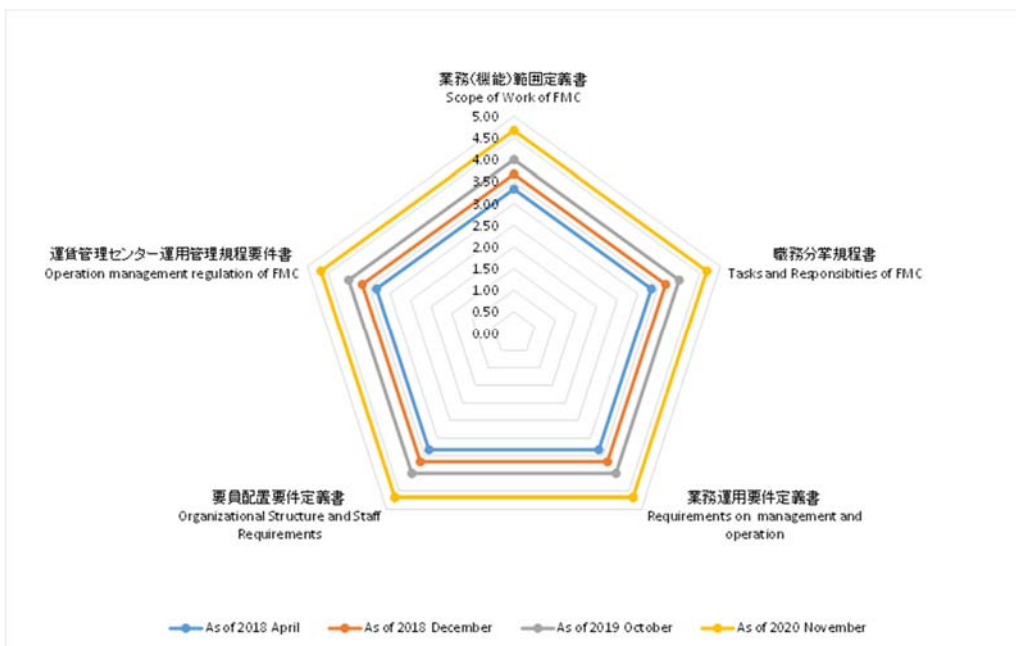


Figure 2 Necessary Knowledge and Skills for Output 2

1.5 Changes of Risks and Actions for Mitigation

N/A

1.6 Progress of Actions undertaken by JICA

N/A

**1.7 Progress of Actions undertaken by The People’s Committee of Hanoi**

N/A

**1.8 Progress of Environmental and Social Considerations (if applicable)**

N/A

**1.9 Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)**

N/A

**1.10 Other remarkable/considerable issues related/affect to the project (such as other JICA's projects, activities of counterparts, other donors, private sectors, NGOs etc.)**

Project is implemented in the context of many movements/fluctuations. Such as Line 2A, Line 3 in the completion process, pilot smart card on BRT Line... Especially, Hanoi started to develop a smart city... They create new several requirements for Project.

**1.11 Tasks to be implemented by JICA Project Team and Counterparts**

Work	Tasks	Implementing agencies
Output 1: 'Design Guideline and Specifications' for interoperable smart card system are developed		
N/A	N/A	N/A
Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.		
N/A	N/A	N/A

**2 Delay of Work Schedule and/or Problems (if any)**

**2.1 Cause**

**(1) Delay in assignment of counterparts**

In the 1st Joint Coordination Committee (JCC) meeting, it was agreed that WG members would be assigned in February 2018. However, the members were actually determined in 29 March 2018 (Decision No. 341/QD-SGTVT).

**(2) Delay caused by comparative study between CBT and ABT**

In compliance with Decision 3978/QD-UBND, the Project Team submitted to HDOT the outline of DG/TS based on the card-based ticketing (CBT) system. This outline of DG/TS underwent the approval process. Although this Project is based on the assumption of adopting the CBT system, Hanoi City proposed to Japan International Cooperation Agency (JICA) to consider account-based ticketing (ABT) system with a perspective of the smart city concept. This led to comparative study between the CBT and ABT systems, which concluded application of the CBT system. The outline of DG/TS was finally approved in 26 April 2019, three months after the submission.

**(3) COVID-19**

Global pandemic of the COVID-19 caused a serious impact on the project implementation, especially preventing Japanese experts from working in Hanoi.

**2.2 Action to be taken****(1) Assignment of counterparts**

In spite of the delay in assignment of WG members at the start of this Project, they actively involved themselves in the Project, including approximately 190 WG meetings. Moreover, participation of IT companies in Hanoi was approved at 4<sup>th</sup> JCC held in 29 August 2019, which allowed members familiar with IT in Hanoi to join the WGs, contributing to formulating the DG/TS based on the actual situation of the city. Director and Vice Director of HDOT, and director of Hanoi Urban Transport Management and Operation Center (TRAMOC) also take active part in the project, closely communicating with the Project Team.

**(2) Comparative study between CBT and ABT**

A study meeting was held in 19 April 2019 chaired by Chairman of HPC. As a result, it was decided to continue the Project based on the submitted outline of DG/TS. This outline was approved in 26 April 2019 (HPC letter No. 1648/UBND-DT).

**(3) COVID-19**

As Japanese experts were not able to visit Hanoi since February 2020, online meetings were held to ensure quality of the Project. Several meetings among executives of HDOT and TRAMOC, JICA Headquarters and JICA Vietnam Office were also held through the Internet.

**2.3 Roles of Responsible Persons/Organization (JICA, The People's Committee of Hanoi, etc.)**

N/A

**3 Modification of the Project Implementation Plan****3.1 PO****3.2 Other modifications on detailed implementation plan****II. Project Monitoring Sheet I & II** *as Attached*

**Project Monitoring Sheet I (Project Design Matrix)**

**Version 7**

**Project title:** Project for Supporting Development of Interoperable Smart Card System for Public Transportation in Hanoi

**Dated. 3 December 2020**

**Project Area:** Hanoi

**Target Group:** Hanoi People's Committee (HPC) and organizations related to public transportation in Hanoi

**Counterpart:** HPC (Hanoi Department of Transport (DOT), Hanoi Department of Science and Technology (DOST), Hanoi Department of Information and Communication (DOIC), Hanoi Metro Company (HMC), Hanoi Transport Corporation (TRANSERCO))

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption	Achievement	Remarks
<b>Overall Goal</b>					
Interoperable smart card systems are developed for the public transportation in Hanoi	<ul style="list-style-type: none"> <li>Number of public transport operators applying the 'Design Guideline and Specifications' developed under the Project to realize interoperable smart card system.</li> <li>Ratio of satisfaction on interoperable smart card is more than XX%.</li> </ul>	Survey report(s)			
<b>Project Purpose</b>					
Technical and management capacities of counterpart agencies under HPC are improved for the development of interoperable smart card system for public transportation in Hanoi	<ul style="list-style-type: none"> <li>'Design Guideline and Specifications' are approved by HPC.</li> <li>The public transport fare policy is established.</li> </ul>	<ul style="list-style-type: none"> <li>Approved 'Design Guideline and Specifications'</li> <li>Project progress report</li> </ul>	Decision no. 3978/QD-UBND dated 13 August 2015 on use of interoperable smart card in public transportation in Hanoi continues to be effective.		
<b>Outputs</b>					
1. 'Design Guideline and Specifications' for interoperable smart card system are developed.	'Design Guideline and Specifications' are finalized.	'Design Guideline and Specifications' (final version)	HPC reviews policy/documents developed under the Project in a timely manner.		
2. Organization terms of reference of each unit of the Fare Management Center (Division) are developed.	Organizational terms of reference for the proposed Fare Management Center (Division) is drafted and submitted for approval.	Organizational terms of reference for the Fare Management Center (Division) (draft for approval)			

Activities	Input		Pre-conditions
	Japanese Side	Vietnamese Side	
1-1. Collect and analyze information on the existing and approved smart card systems for the public transportation system in Hanoi	1. Japanese Experts - Leader - Public Transport Fare Policy and System - Interoperable Smart Card System - Communication System - Fare Management System	1. Project Counterparts (1) HPC (2) HDOT - Road Transportation Management Division - Planning and Investment Division - Economics planning Division - TRAMOC (3) DOST (4) DOIC (5) HMC (6) TRANSERCO 2. Provision of Office Space and equipment 3. Cost for - counterpart members - office operation and maintenance - others (local travel expenses excluding airfare for Vietnamese side, etc.)	Official request to apply for Japan's ODA Loan Project.
1-2. Prepare an outline of 'Design Guideline and Specifications' and fare policy  1) Examination of fare ticket specifications for interoperable use 2) Examination of fare system rules for interoperable use 3) Examination of the operation rules 4) Examination of the technical specifications	2. Counterpart Training in Japan 3. Seminar and workshop 4. Other cost - Local experts and consultants - Local staff - Others (survey, card rental, etc.)		
1-3. Consult with the relevant authorities and finalize the outline of the 'Design Guideline and Specifications' and fare policy			
1-4. Draft a 'Design Guideline and Specifications' with fare policy			
1-5. Consult with the relevant authorities and finalize the 'Design Guideline and Specifications'			
1-6. Conduct seminar(s) to introduce the draft 'Design Guideline Specifications' and fare policy			
2-1. Define the scope of work to be performed by the proposed Fare Management Center (Division)  1) Conduct a survey of relevant laws and regulations 2) Define the scope of work of the fare management center (division)			
2-2. Define the tasks and responsibilities of departments/division under the Fare Management Center (Division)			
2-3. Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division)			
2-4. Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.  1) Prepare a TOR 2) Organizational structure and staff requirements			

Inputs	Plan	2018												2019												2020												2021			Remarks	Issue	Solution
		Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb			
<b>Expert</b>																																											
Team Leader/ Urban Public Transport	Plan																																										
Deputy Team Leader/ AFC Technical Management	Plan																																										
Public Transport Fare Policy [Railway]	Plan																																										
Public Transport Fare Policy [Bus]	Plan																																										
Interoperable Smart Card Plan	Plan																																										
Smart Card Data Management and Utilization	Plan																																										
Interoperable Smart Card System [Railway]	Plan																																										
Interoperable Smart Card System [Bus] 1	Plan																																										
Interoperable Smart Card System [Bus] 2	Plan																																										
Communication System	Plan																																										
Fare Management System [AFC Technical Specification] 1	Plan																																										
Fare Management System [AFC Technical Specification] 2	Plan																																										
Fare Management System [AFC Host System]	Plan																																										
Organization Institution	Plan																																										
Monitoring/ Training in Japan/ Coordination	Plan																																										
<b>Training in Japan</b>																																											
	Plan																																										
	Actual																																										
<b>Activities</b>																																											
Sub-Activities	Plan	2018												2019												2020												2021			Responsible Organization	Achievements	Issue & Countermeasures
	Actual	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar		
<b>Output 1: 'Design Guideline and Specifications' for interoperable smart card system are developed.</b>																																											
1-1 Collect and analyze information on the existing and approved smart card systems for the public transportation system in Hanoi.	Plan																																										
	Actual																																										
1-2 Prepare an outline of 'Design Guideline and Specifications' and fare policy.	Plan																																										
	Actual																																										
1) Examination of ticket specifications for interoperable use	Plan																																										
	Actual																																										
2) Examination of fare system rules for interoperable use	Plan																																										
	Actual																																										
3) Examination of the operational specifications	Plan																																										
	Actual																																										
4) Examination of the technical specifications	Plan																																										
	Actual																																										
1-3 Consult with the relevant authorities and finalize the outline of the 'Design Guideline and Specifications' and fare policy.	Plan																																										
	Actual																																										
1-4 Draft the 'Design Guideline and Specifications' with fare policy.	Plan																																										
	Actual																																										
1-5 Consult with the relevant authorities and finalize the 'Design Guideline and Specifications' and fare policy	Plan																																										
	Actual																																										
1-6 Conduct seminar(s) to introduce the Draft 'Design Guideline and Specifications' and fare policy.	Plan																																										
	Actual																																										
<b>Output 2: Organizational terms of reference of each unit of the Fare Management Center (Division) are developed.</b>																																											
2-1 Define the scope of work to be performed by the proposed Fare Management Center (Division).	Plan																																										
	Actual																																										
1) Conduct a survey of relevant laws and regulations	Plan																																										
	Actual																																										
2) Define the scope of work of the Fare Management Center (division)	Plan																																										
	Actual																																										
2-2 Define tasks and responsibilities of each unit under the Fare Management Center (Division).	Plan																																										
	Actual																																										
2-3 Consult with relevant authorities with regard to the defined tasks and responsibilities of each unit under the Fare Management Center (Division).	Plan																																										
	Actual																																										
2-4 Prepare and submit organizational terms of reference detailing the specific tasks and responsibilities of each unit under the Fare Management Center (Division), including organizational structure and staffing requirements.	Plan																																										
	Actual																																										
1) Prepare a TOR	Plan																																										
	Actual																																										
2) Organizational structure and staff requirements	Plan																																										
	Actual																																										
<b>Monitoring Plan</b>																																											
Monitoring	Plan	2018												2019												2020												2021			Remarks	Issue	Solution
	Actual	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb			
Joint Coordinating Committee	Plan																																										
	Actual																																										
Set-up the Detailed Plan of Operation	Plan																																										
	Actual																																										
Submission of Monitoring Sheet	Plan																																										
	Actual																																										
Monitoring Mission from Japan	Plan																																										
	Actual																																										
Joint Monitoring	Plan																																										
	Actual																																										
Post Monitoring	Plan																																										
	Actual																																										
Reports/Documents	Plan																																										
	Actual																																										
Project Completion Report	Plan																																										