Title	The voyage of TSUNEISHI for the next 100 years : Revitalization of the local community
Sub Title	地域社会の活性化、ツネイシ（広島県福山市）スマートコミュニティープロジェクト
Author	ツネイシホールディングス株式会社(Tsuneishi Holdings Corporation) 保井, 俊之(Yasui, Toshiyuki) 東瀬, 朗(Tose, Akira)
Publisher	慶應義塾大学大学院システムデザイン・マネジメント研究科
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Abstract	The team M worked on the revitalization project of Tsuneishi area propsed by Tsuneishi HD. As a result of this year's project, we proposed "Tsuneishi Smart Community" system. This systemutilized strong and active local community, which is valuable social capital in Tsuneishi area. Through our project, we clarified five core issues in Tsuneishi area. Communication, traffic, shopping, education and land are their core issues. We interviewed residents in Tsuneishi for 5 times. At first, we defined four problems from the VOC by using KJ diagram. i. Traffic problem caused by lack of public transport system and narrow road. ii. People can't drive a car have difficulty to go shopping iii. Children must go other area for higher education. iv. Narrow land restrict to build new buildings and houses In this project, we defined "revitalization" as improving these problems. We selected traffic problem as most important. The land problem is given environment, and has huge challenge to improve it. Causal loop diagram shows that the shopping and education problem will be solved by traffic system. While the interview, people mentioned about the traffic problem most frequently. According to the questionnaire responded by Tsuneishi residents, 60% people think that the traffic problem is the most important. Additional interview and observation conducted after we defined four problems showed us the other problem: communication gap in Tsuneishi area. There are 3 major gaps between sub-communities, such as different generation, different town association, or Tsuneishi Employee and other residents. On the other hand, we found out that there are active local community. They have many event and communication in the community center. It is the wonderful resource in Tsuneishi. CVCA included interview results shows us that these sub-communities have no relations each other. WCA result is similar. As a result of concept generation, we reached "On Demand Bus" system as initial idea. On Demand Bus System is the public transportation system with flexible bus operation is regarding user demand. QFD result shows time to destination and distance to bus stop are key quality metric in transportation system design. In this phase this system seems suitable solution. . In the next phase, we used Pugh selection to compare traffic systems. Both of On Demand Bus System and Car Sharing System show similar advantage, so we combined each advantage and propose new system. On Demand Bus System has challenge on sustainable profit. The system is introduced in the many community, butalmost all of these cases require the subsidy from local govenment Usually 70% of incomes are subsidies. The system is very useful for substitute of the local fixed route bus, but it is difficult to operate for private enterprises. From the study result we made, we recommend Hitch Life Community System. The system has a concept "we are all friends in Tsuneishi". The system is the membership carpool system in Tsuneishi utilize strong human network. A fundamental use-case is described below. Drivers and users made member registration first. A driver responds to a user's hitchhike usually. User interface is local SNS and Kairanban: a notice around from house to house in the neighborhood. A user can check operation status of a car and make reservation. A driver pick up users could earn local currency as incentive. Moreover, the system uses the bus already operated inside the Tsuneishi HD factory as a On Demand Bus in the high demands time as morning. Income source of the system is user's registration fee, advertise revenue on the car and sales of cooperation stores. We carried out field survey of the French Covoiturage system as the system's benchmark. Covoiturage is the carpool system using SNS started by a venture enterprise. The system is intended to transport from a local city to other local city in French. At first, users and drivers write

	their schedule and search for travel partner. Users have to negotiate with a driver from several days before. A user pays a part of highway cost and gasoline cost for a driver. Now, Covoiturage is a governmental promotion enterprise and has 1,000,000 users. In the early phase of this system, Tsuneishi HD will recommend their employee, which occupies the half of the daytime population in Tsuneishi area becoming a driver to provide drivers need in early phase. We assume that student who attends school not located in Tsuneishi area will be major user in early phase. Biggest risk of thinking has uneasiness to the responsibility and safety in case of a traffic accident. It seems that both user and driver feel anxious from result of questionnaire. As a countermeasure, evaluation system of the driver similar to covoirturage could be introduced.
Notes	Student final reports Group M
Genre	Research Paper
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=KO40002003-00002011-0813

Group M

Group M's Theme Proposed by Tsuneishi Holdings Corporation

ALPS "Symbiosis and Synergy" theme title: Revitalization of the Local Community

Proposer Organization's Name: TSUNEISHI HOLDINGS CORPORATION
Contact Person's Name and Contact Person's email: Kazuhiro Kanemasa / kazuhiro kanemasa@tsuneishi.com
Haruko Imoto / haruko imoto@tsuneishi.com

Abstract of your project theme :

【Background】

TSUNEISHI Group is located in Numakuma-cho, the coastal area of Fukuyama city, Hiroshima. Its main business is shipbuilding and has been developed with the support from local community for more than 100 years since 1903. But one of the main issues is how to survive in Japan and continue to support the local economy because Korea and China have been expanded their building shares in the new shipbuilding industries recently.

Tsuneishi area, Numakuma-cho, the local community also has an expecting big crisis that the town might become inactive in future by many various problems such as the population decline, the aging population, the weak infrastructures of communication and transportation, etc.

【Opportunity to Change】

TSUNEISHI has a plan to renovate its main office building and some company condominiums among the owned 50 of them. Moreover, it also has a plan to organize a smart grid infrastructure among the main office, the factories and company condominiums to reduce its energy consumption comprehensively.

We expect that if we can organize a smart community not only by ourselves but also together with the town and its residents, we might be able to revitalize the local community by its synergy effect.

【Target & Expected theme for ALPS】

To revitalize the local community by a symbiotic smart community between the company and the local people

1. How to inspire the local people to join the project.
2. How to produce synergy effects and activate the social life in the local area.

<Key Point>

1. What is the advantage for the local town and its people to join the project?

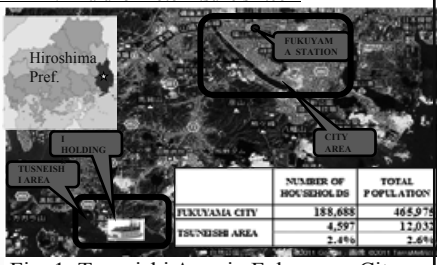

Fig. 1: Tsuneishi Area in Fukuyama City

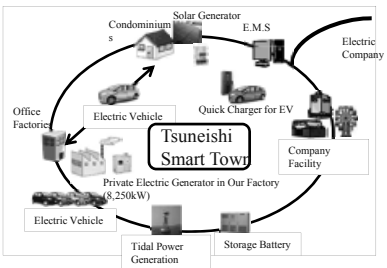

Fig. 2: Tsuneishi Smart Community

ALPS Final Report 2011

Group M

Project Title:
The Voyage of TSUNEISHI for the Next 100 Years

Theme:
Revitalization of the Local Community

Proposer Organization: Tsuneishi Holdings Corporation

Proposer Organization's Supporter: Shinji WATADANI, Kazuhiro KANEMASA,
Haruko IMOTO & Hiroko IKEDA

Keio Mentor: Toshiyuki YASUI & Akira TOSE

Members:
Erika IKEDA
Kohei TANAKA
Atsushi ATARASHI
Shigeo SUZUKI
Takafumi HARADA
Yuka YAMAMOTO

Graduate School of System Design and Management
Keio University

Final Report
The Voyage of TSUNEISHI for the Next 100 Years

ALPS Team M

TSUNEISHI HD

Erika Ikeda, Kohei Tanaka, Atsushi Atarashi, Shigeo Suzuki, Takafumi Harada, Yuka Yamamoto

Graduate School of System Design and Management,
Keio University, 4-1-1 Hiyoshi, Kouhoku, Yokohama Kanagawa, 223-8526, Japan

1. Executive Summary

The team M worked on the revitalization project of Tsuneishi area propsed by Tsuneishi HD. As a result of this year's project, we proposed "Tsuneishi Smart Community" system. This systemutilized strong and active local community, which is valuable social capital in Tsuneishi area . Through our project, we clarified five core issues in Tsuneishi area. Communication, traffic, shopping, education and land are their core issues.

We interviewed residents in Tsuneishi for 5 times. At first, we defined four problems from the VOC by using KJ diagram.

i. Traffic problem caused by lack of public transport system and narrow road.
ii. People can't drive a car have difficulty to go shopping
iii. Children must go other area for higher education.
iv. Narrow land restrict to build new buildings and houses

In this project, we defined "revitalization" as improving these problems.

We selected traffic problem as most important. The land problem is given environment, and has huge challenge to improve it. Causal loop diagram shows that the shopping and education problem will be solved by traffic system. While the interview, people mentioned about the traffic problem most frequently. According to the questionnaire responded by Tsuneishi residents, 60% people think that the traffic problem is the most important.

Additional interview and observation conducted after we defined four problems showed us the other problem: communication gap in Tsuneishi area. There are 3 major gaps between sub-communities, such as different generation, different town association, or Tsuneishi Employee and other residents. On the other hand, we found out that there are active local community. They have many event and communication in the community center. It is the wonderful resource in Tsuneishi.

CVCA included interview results shows us that these sub-communities have no relations each other. WCA result is similar.

As a result of concept generation, we reached "On Demand Bus" system as initial idea. On Demand Bus System is the public transportation system with flexible bus operation is regarding user demand. QFD result shows time to destination and distance to bus stop are key quality metric in transportation system design. In this phase this system seems suitable solution. . In the next phase, we used Pugh selection to compare traffic systems. Both of On Demand Bus System and Car Sharing System show similar advantage, so we combined each advantage and propose new system.

On Demand Bus System has challenge on sustainable profit. The system is introduced in

the many community, butalmost all of these cases require the subsidy from local govenment Usually 70% of incomes are subsidies. The system is very useful for substitute of the local fixed route bus, but it is difficult to operate for private enterprises.

From the study result we made, we recommend Hitch Life Community System. The system has a concept “we are all friends in Tsuneishi”. The system is the membership carpool system in Tsuneishi utilize strong human network. A fundamental use-case is described below. Drivers and users made member registration first. A driver responds to a user's hitchhike usually. User interface is local SNS and Kairanban: a notice around from house to house in the neighborhood. A user can check operation status of a car and make reservation. A driver pick up users could earn local currency as incentive. Moreover, the system uses the bus already operated inside the Tsuneishi HD factory as a On Demand Bus in the high demands time as morning. Income source of the system is user’s registration fee, advertise revenue on the car and sales of cooperation stores.

We carried out field survey of the French Covoiturage system as the system’s benchmark. Covoiturage is the carpool system using SNS started by a venture enterprise. The system is intended to transport from a local city to other local city in French. At first, users and drivers write their schedule and search for travel partner. Users have to negotiate with a driver from several days before. A user pays a part of highway cost and gasoline cost for a driver. Now, Covoiturage is a governmental promotion enterprise and has 1,000,000 users.

In the early phase of this system, Tsuneishi HD will recommend their employee, which occupies the half of the daytime population in Tsuneishi area　becoming a driver to provide drivers need in early phase.

We assume that student who attends school not located in Tsuneishi area will be major user in early phase.

Biggest risk of thinking has uneasiness to the responsibility and safety in case of a traffic accident. It seems that both user and driver feel anxious from result of questionnaire. As a countermeasure, evaluation system of the driver similar to covoirturage could be introduced.

2. Table of Contents

3. Problem Statement

Following requirements were given from Tsuneishi Holdings, our proposer company. This requirement reflects the their history which developed with the Tsuneishi area for 100 years.

Table 3-1 Initial requirements from TSUNEISHI HD

Kind of requirements	Content of requirements
Requirement of mission	Tsuneishi HD shall continues for 100 years with TSUNEISHI region and redident
Most important requirements	This system shall activate TSUNEISHI region

First, we made several visit to Tsuneishi area to gather residents' voice. Through the resident's voice we gathered, we defined "Regional revitalization" in Tsuneishi area. We gathered many resident's, employee's, government's and other stakeholder's voice. As a result, we defined that we should solve the following five issues to revitalize the Tsuneishi area. Also we found their problems have structure as shown in below. Transportation issues are root problem in this area.

Table 3-2 Requirements for revitalizing the Tsuneishi aera

Kind of requirements	Content of requirements
Function of requirements	This system shall make transportation comfortable for elderly and children
Function of requirements	This system shall make education comfortable for Tuneishi residents
Function of requirements	This system shall make shopping comfortable for elderly and children
Function of requirements	This system shall make land use comfortable for Tsuneishi residents
Function of requirements	This system shall make communication comfortable for Tsueneishi residents

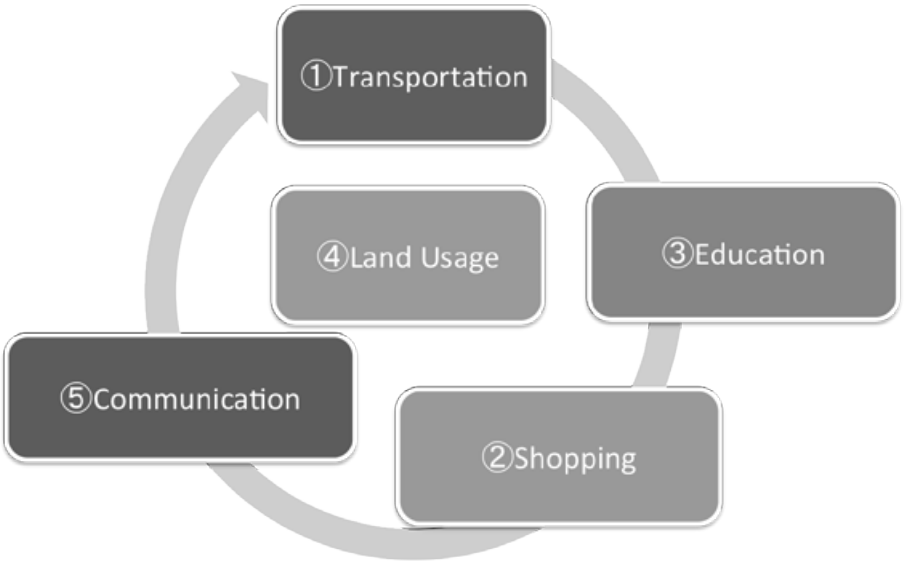

Fig. 3-1 Strucuture of Tsuneishi's problems

4. Analysis and Discussion of ALPS Methods

1.1. Mind Map – When did you use this and how was it useful?

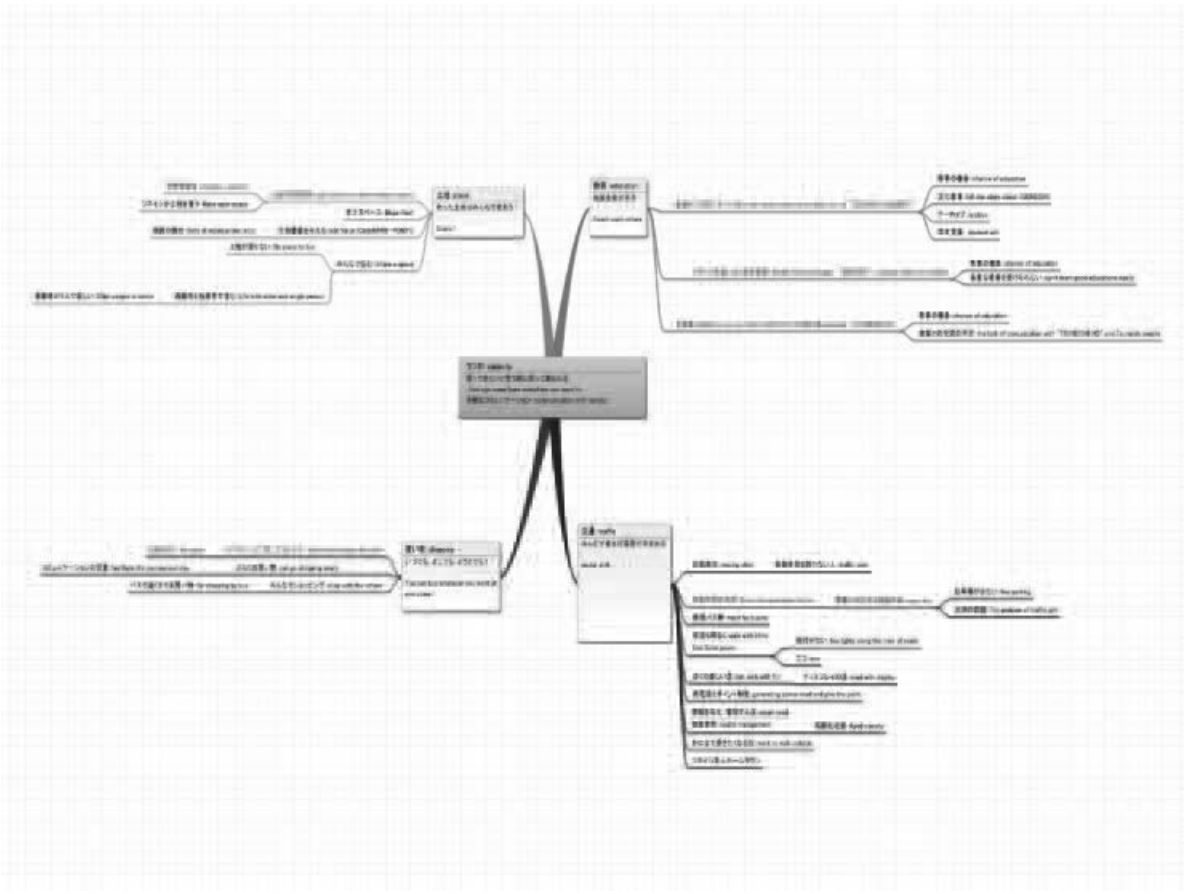

Fig. 4-1 Mind Map

We use “Mind Map” to find out how we can solve the problem of *Tsuneishi* community. To revitalize the *Tsuneishi* community, we divided the way to solve for 4 parts, ommunity, we di, Shopping ,Education, Land usage o.

1.2. Project Priority Matrix - How did you choose what is constrained, optimized, accept?

Table 4-1 Project Priority Matrix

	Constrain	Optimize	Accept
Feature		○	
Cost			○
Time	○		

Our proposer company, *Tsuneishi* HD, is located in Hiroshima Prefecture. We have to go far to *Tsuneishi*. So, time is most constrained. We had a huge budget (¥100 million!!), so cost is Accaptable.

1.3. Scenario Graph - Explain how you brainstormed and selected your scenario(s).

Table 4-2 Scenario Graph

1	Who	Who2	What1	What2	Where	When	How1	How2	Why
2	マツダ	県庁	自動車	ホテル	観光地	今	メディアに取り上げられる	山と海に囲まれていることを活かして	地域活性化
3	老人ホーム	県民	道路	ゴルフ場	店	100年後	映画の舞台になる	社会貢献することを通して	
4	サンフレッチェ	JFE	家	文化	レストラン	昼	EVが走る	船の免許取る施設	
5	宮崎駿	地元マスコミ	学校	お好み焼き	地域コミュニティ	夜	地元アイドルグループが誕生する	海上生活体験ツアー	
6	ヨットオーナー	市立大学	病院	福山田楽	海	朝	船の科学館ができる	ゴミ問題解決のためのボランティア	
7	歴史ファン	美術館	鞆の浦	携帯電話	山		海洋研究センターの設置	老人介護のボランティア	
8	広島大学	シネイン社員	造船所	鯛	集会		キャンプ	大学生との共同研究	
9	観光客	若者	パナマックス	山	森		温泉ツアー	ベンチャー企業支援	
10	映画制作者	高齢者	遊覧船	森	レジャー施設		鞆の浦観光ツアー	NPO支援	
11	船を買う人	中国電力	産業廃棄物	海	工場		若者を集める	花火大会	
12	鞆の浦観光協会	漁協	ソーラーパネル	川	社宅		老人に優しい町に	超先端教育を施す小中高一貫校	
13	福山市商店街	農家	EV	社員宿舎	大学		働きがいのある町に	買い物代行サービス	
14	海外からの社員	ヲタク	電気バス	ブドウ	温泉		ずっこけの映画化	パーソナルモビリティの普及	
15	元町長	地元出身アイドル	トローリーバス	農産物	遺跡		スマグリ実験モデル	サイクリングロードの整備	
16	市長	ずっこけ3人組	蓄電池	海産物	商店街		企業誘致	頻繁な町内会活動	
17	市議会	ＮＰＯ（環境）	レアメタル	遊園地	駅前広場		サマーキャンプ	マラソン大会の開催	
18	その他事業部		鉄鋼	温泉	ホテル		B級グルメ	リゾートで湯治と最先端医療	
19	下請け企業		商店街	レジャー施設	ゴルフ場		地元民の絆を深める	高校生向けインターンシップ	
20	地域企業		おみやげや	地元民の暗黙知	みろくの里		新しいサービスの提案	アニメの舞台	
21	誘致したい企業		尾道	伝統	遊園地		新しいビジネスの提案	海上に船を浮かべた海浜公園	
22	ベンチャー企業		遺跡	造船技術	浜辺		仕事が増える	北海道物産展	
23	病院		日ットハーバー	アイデンティティ	造船施設		大河ドラマの舞台		
24	子ども		駅前の商業施設	聖地	大学		研究会を開く		
25	学校		ジャスコ	工場見学	お寺		先端研究をする		
26	先生		「場」	文化祭	神社		もの作りの町にする		
27	市役所		保育園		老人ホーム		温暖な気候を活かして		
28	沼隈住民		大学		バス停		地震が少ない環境を活かして		
29	福山市民		みろくの里		釣り堀		海に近いことを活かして		

We brainstormed and detailed the events ["Who, What, Where, When, How, Why"]. And we used excel to make the scenario in random order.

We selected the scenario as the following order.

・Does it have a reality? [in a cost and resource]

・Is it interesting?

1.4. CVCA - While summarizing what you found by doing this tool - explain how you found those. Pay particular attention to any new stakeholder that you discovered.

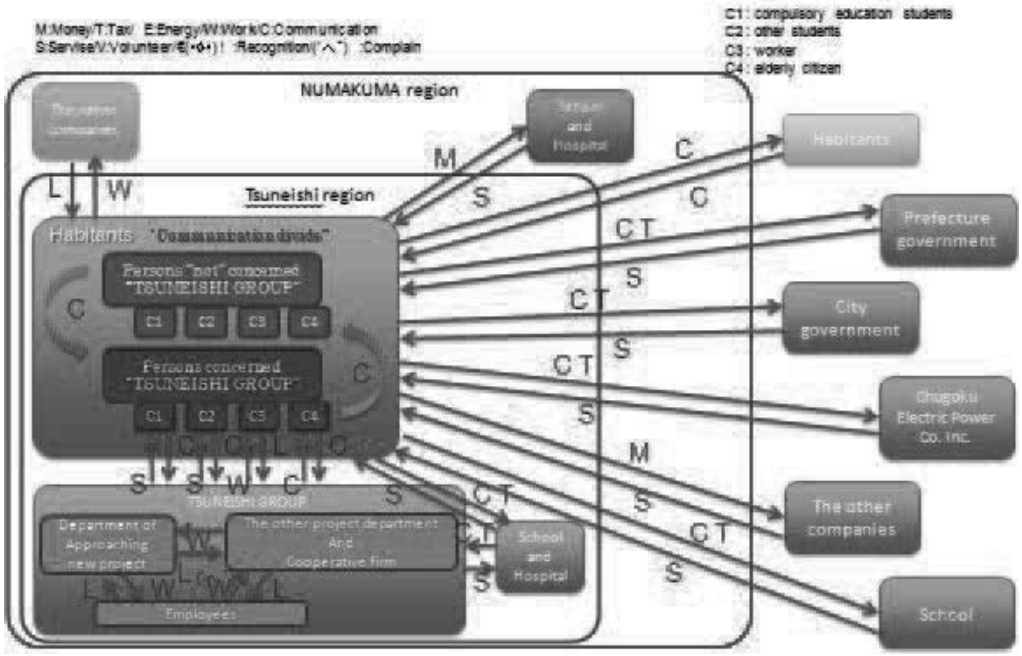

Fig. 4-2 CVCA ver.3

We changed our "CVCA" for 3 times.

First, we had wrong stakeholders.

Second, we misunderstood the relations between *Tsuneishi* HD and *Tsuneishi* people. We thought that there were no relations. (But there were relations.

Finally we found out the right relations from the Interviews. *Tsuneishi* people hoped *Tsuneishi* HD to solve the problem to revitalize *Tsuneishi* community.

1.5. Interview Observation – Where did you visit? What have you learned? How did it help or change your project?

<<About traffic>>

- Difficulty in going to school
  - Too expensive
  - Poor transportation
    - Don't come at short intervals
    - Finish early
- Need a car to go around
- Traffic jam
- Bad manner at driving

- Road isn't good at driving : narrow road
- Dark road

<<About shopping>>

- Can't do shopping with a light heart
  - Have to take a vehicle
- Main shopping center is located at center city
- Not easy at bringing the package for elder people
  - Elder people live in mountainous region
- Using COOP
  - Can't decide the menu from day to day
- Using shopping help bus
  - Weak sustainability

<<About education>>

- Poor level at learning
  - Few school left
    - Students decrease
  - Top level school is only located at *Fukuyama* city center
- Few space at playing outdoors

<<About land>>

- Hang on their premises
  - Newcomer can't live
- Few space left to park
- Poor sewage improvement
- Poor condition
- Good temperature to live

<<About communication>>

- Poor communication : generation gap
- Information about *Tsuneishi*
  - Want more information from *Tsuneishi*
- Young people don't join in the event at *Tsuneishi*…
- We use "Shopping-Support Bus (*Kaimono Shien Bus*)" to communicate with the others.
  - Want more opportunity to communicate.
- Should use community center.
  - Want young people and *Tsuneishi* member to come…

- Want a opportunity to exchange of opinions with *Tsuneishi* member.

We went *Tsuneishi* for 6 times and interviewed 90 people who lived in *Tsuneishi*. We did it to figure out the **NEEDs** to revitalize the *Tsuneishi* communities.

First, we thought that the problems we have to solves are “Transportation, Shopping ,Education, Land usage e,but after the Interviews, we found out the new problem, “Communications”.

1.6. Scenario Prototyping Rapidly – What did you try to test?

Fig. 4-3 Prototype

We used this Prototype [Fig. 4-3] when we had Interviews to stakeholders. We had a lot of opinions from them [1.5].

1.7. Value graph - What's surprising?

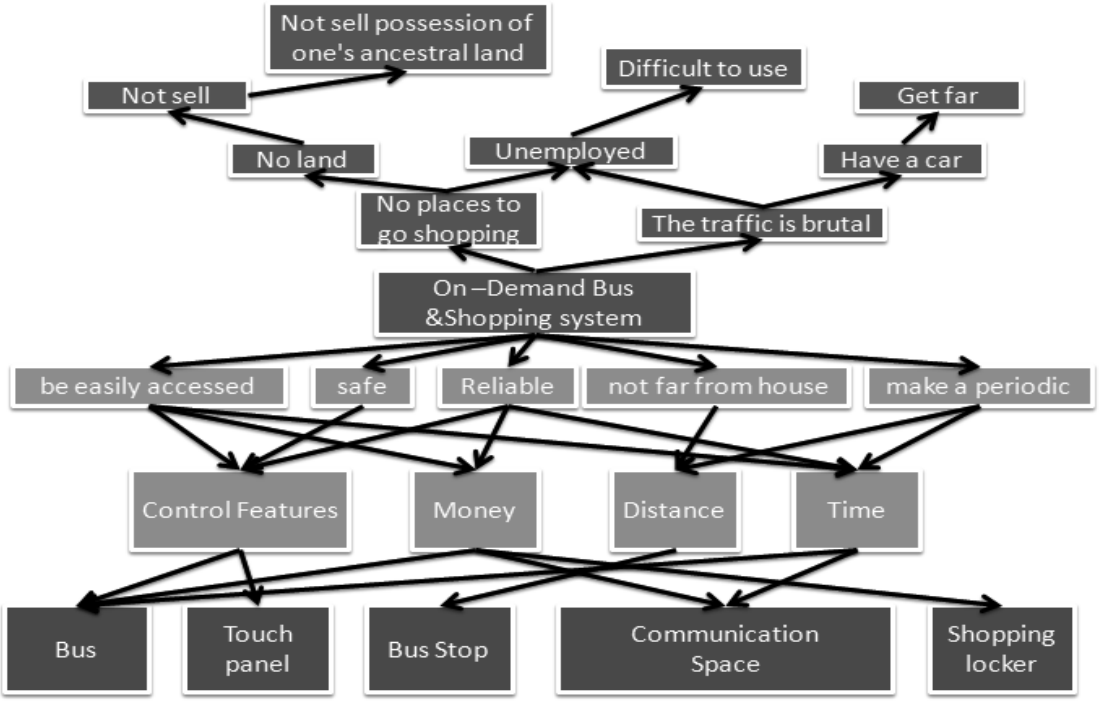

Fig. 4-4 Value graph

We could organize the value and found out that "On-Demand Bus & Shopping System" solves "Transportation, Shopping, and Land Usage" problems.

1.8. Function-Structure map - Explain the items that are connected more than others and whether that matches your expectations?

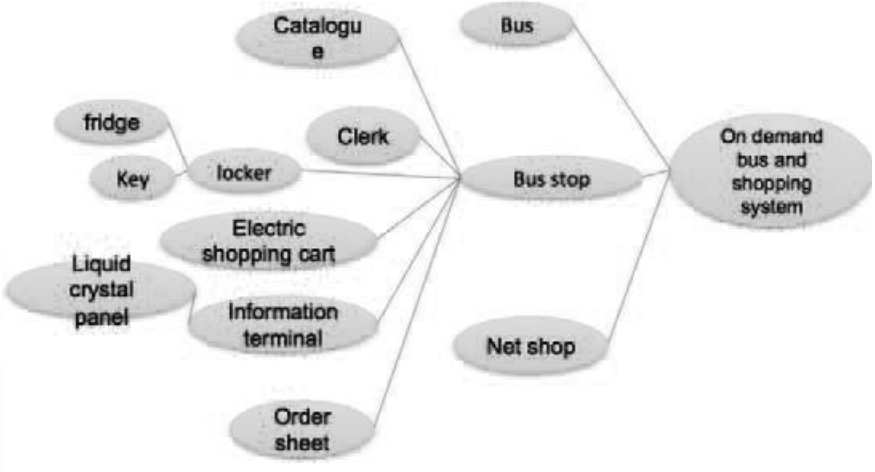

Fig. 4-5 Function-Structure map

We could use "Function-Structure map" when we focused on "On-demand Bus and Shopping System". We could organized the sub-systems to solve the *Tsuneishi* problems.

1.9. Design of Variety

Fig. 4-6. shows this system's components. This system is made of some existing and variety components. We appropriate components from function for realizing operation scenario. So this system is very feasible and has low development cost.

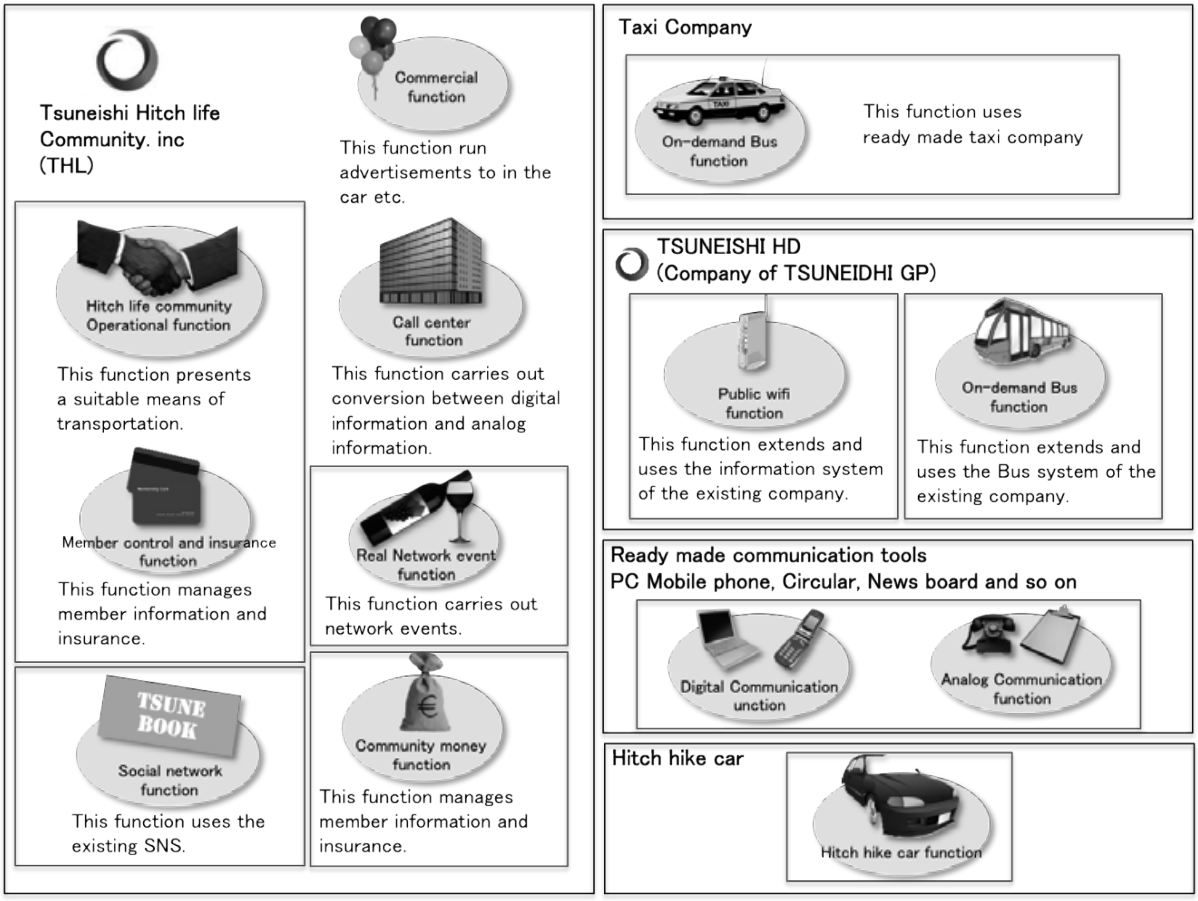

Fig. 4-7 System's compornents

1.10. Environmental Complexity/Recyclability

In this system, scope of application is local area that is TSUNEISHI region. So this system analysis is a little different from general CVCA, QFD, and CWA because we have to consider local individuality. Resident of TSUNEISHI area can be divided by generation. Many elderly people is feeling benevolently. But many young people is unconcerned. There is a wide divergence of opinion among each generation. By considering each generation, we got data correctly for CVCA, QFD and CWA.

1.11. Serviceability

We have main 5 modes are membership, activation of communication, transportation, shopping (incentive for user) and source of earnings in this system. Most important modes

are 2 modes are activation of communication and transportation. Their modes are solution of TSUNEISHI's problems. But their modes needs to be treated about matter of mode operation by other mode. Therefore we added other 3 modes because most important 2 mode are treated.

Table 4-3. Type of mode

Mode	Function of mode	role
Mode1	Transportation	Solution
Mode2	Activation of communication	Solution
Mode3	Membership	Treat mode1,2
Mode4	Shopping (Incentive for users)	Treat mode1,2
Mode5	Source of earning (Incentive for operator)	Treat mode1,2

1.12. Quality Scorecarding

We defined some parameter and transfer function as quality scorecarding.

Biggest Y : Population of Tsuneishi area

Big Y : Activation of Tsuneishi area : Convenience of Trasnportaion, Education, Shopping and Land usage.

Important X : Meaning of transportation, providing opportunity of communication, number of house, number of parking

Noise Z : Economic condition, Declining Birthrate and Aging Population, Disaster

Transfer function : Analysis of population

1.13. Design of experiment

Table 4-5 is Requirement and V&V Matrix shows relationship between requirement and V&V plan. Basically Verification plans are made of Observation. But we did not decide criteria for verification because this criterion depends on current condition. And Validation plans are made of Questionnaire.

1.14. Design Structure Matrix

Our system is social system using Technology. Although our system have Technical system, in this time mainly our proposal is Architecture of social system. Therefore we can not use this method for detail of our system. So we show Design Structure Matrix for general system design we can use.

Table 4-4. Design Structure Matrices

		Decision task for values and management criteria										
		Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11
Decision task for values and management criteria	Item 1	■										
	Item 2	○	■	○								
	Item 3	○	○	■								
	Item 4	○		○	■	○						
	Item 5	○			○	■						
	Item 6	○			○	○	■					
	Item 7	○			○		○	■				
	Item 8	○			○		○	○	■			
	Item 9	○			○		○	○	○	■		
	Item 10	○			○		○			○	■	
	Item 11	○			○							■

Item list	–
Item 1	VOX
Item 2	Analyzing ″As is″
Item 3	Clarification of problems
Item 4	Analyzing ″To be″
Item 5	Making operation senareo
Item 6	Designing architecture
Item 7	Designing subsystems
Item 8	Planing V and V process
Item 9	Integrate of subsystems
Item 10	V and V
Item 11	Planing of realization

Table 4-5. Requirements and V&V Matrix

ID			Kind of requirements	Object	Content of requirements	Validation	Verification	Note
1	–	–	Requirement of mission	All	Tsuneishi HD shall continues for 100 years with TSUNEISHI region and redident	Questionnaire	–	
	–	–	Most important requirements	All	This system shall activate TSUNEISHI region	Questionnaire	–	
					–			
	1	–	Function of requirements	resident	This system shall make transportation confortable for eldarly and children	Questionnaire	–	
			Function of requirements		About traffic volume	–	Observation	TBD (Deciding criteria)
			Function of requirements		About time to central Fukushima	–	Observation	TBD (Deciding criteria)
		1	Function of requirements	resident	This system shall make education confortable for eldarly and children	Questionnaire	–	
			Function of requirements		About level of education	–	Exam by MEXT	TBD (Deciding criteria)
			Function of requirements		About kind of school	–	–	TBD (Deciding criteria)
			Function of requirements		About number of school	–	–	TBD (Deciding criteria)
		2	Function of requirements	resident	This system shall make shopping confortable for eldarly and children	Questionnaire	–	
			Function of requirements		About time to store	–	Observation	TBD (Deciding criteria)
		3	Function of requirements	resident	This system shall make land use confortable for eldarly and children	Questionnaire	–	
			Function of requirements		About dimenton of non-use land in TSUNEISHI region	–	Observation	TBD (Deciding criteria)
		4	Function of requirements	resident	This system shall make communication confortable for eldarly and children	Questionnaire	–	

1.15. QFD

This is QFD for our system. QFD result shows time to destination and distance to bus stop are key quality metric in transportation system design.

Table 4-6 QFD phase I

Requirement	Weight for customers	Industrial Metrics: Control Features	Money	Distance	Time
be easily accessed	9		1	9	9
safe	9	3			
Reliable	3	3			
not far from house	3			9	3
make a periodic	1		9		3
Score		36	18	108	93
Relative Score		0.1	0.1	0.4	0.4

Table 4-7 QFD phase Ⅱ

Industrial Metrics	Weight by Ⅰ	Parts Features: Bus	Touch Panel	Bus Stop	Communication Space	Shopping locker
Control Features	0.1	3	3		9	9
Money	0.1	9	3	3	9	3
Distance	0.4			9		
Time	0.4	3		9	0	
Score		2.2	0.6	7.3	1.9	1.5
Relative Score		0.2	0	0.5	0.1	0.1

5. Design Recoomendation

After several visits to Tsuneishi Area, we have found out that there is a strong demand for convenient local transportation system. We have thus proposed "Tsuneishi Hichlife System," which resolves transportation issues of Tsuneishi area. In addition, we have carefully designed the system to enhance communication among Tsuneishi people, because we learned that there are potentially strong ties in Tsuneishi community but that communication among sub-community is not active; e.g. among different generations, among people from different small areas and among Tsuneishi people and Tsuneishi holdings. We believe that revitalizing local community requires active participation of local residents and that activation of communication among them is essential. We believe this system would help Tsuneishi people to understand their local area and local community well and hope that they will revitalize Tsuneishi area on their own. Fig. 5-1 shows "AS IS" of Tsuneishi area and Fig. 5-2 shows "TO BE" of Tsuneishi Area.

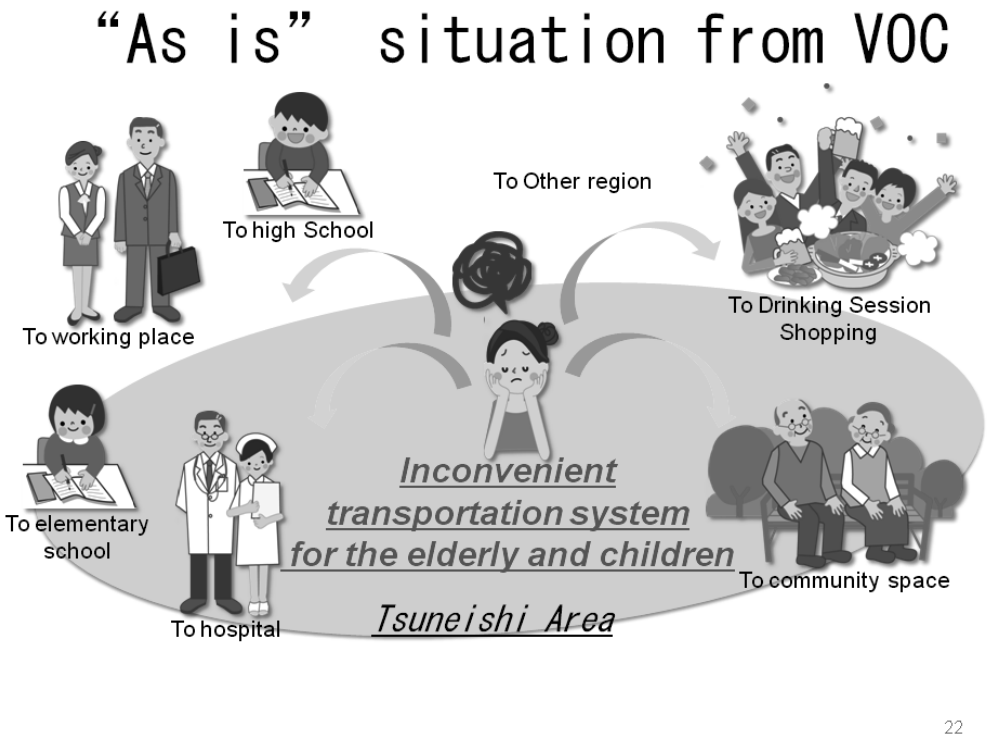

Fig. 5-3 Tsuneishi Area "As Is"

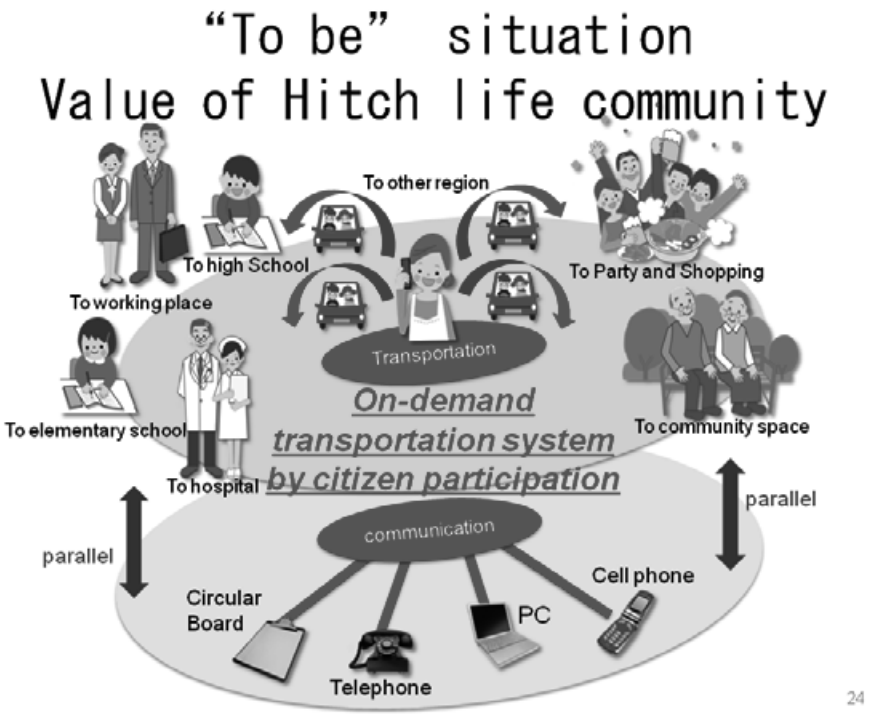

Fig. 5-2 Tsuneishi Area "TO BE"

Please note that we have designed the system to minimize the initial investment and to balance revenue and expenditure, because the current Tsuneishi population is not large enough to have effective investment.

We have also included several sub-systems which make the whole system more attractive and help increase revenue. We believe this proposal will be effective for establishing "Smarty Cities" suited for Japanese rural areas.

1.1. Overview of Tsuneishi Hitch Life System

Fig. 5-3 and Fig. 5-4 show the overview of "Tsuneishi Hitch Life System." As stated in the previous section, the system has been designed both to improve local transportation system and to enhance communication among Tsuneishi community. For the transportation part, we have proposed a system based on "Hitch Hiking." This is intended to complement existing transportations sytem such as taxies and on-demand bus system which Tsuneishi holdings is planning to introduce. For the communication part, the system provides social events where the users of the system can familiarize each other. The system also provides SNS system for local residents and conventional communication channels including F2F, telephone, message boards, etc can be utilized. And system use case is attached to Appendix.

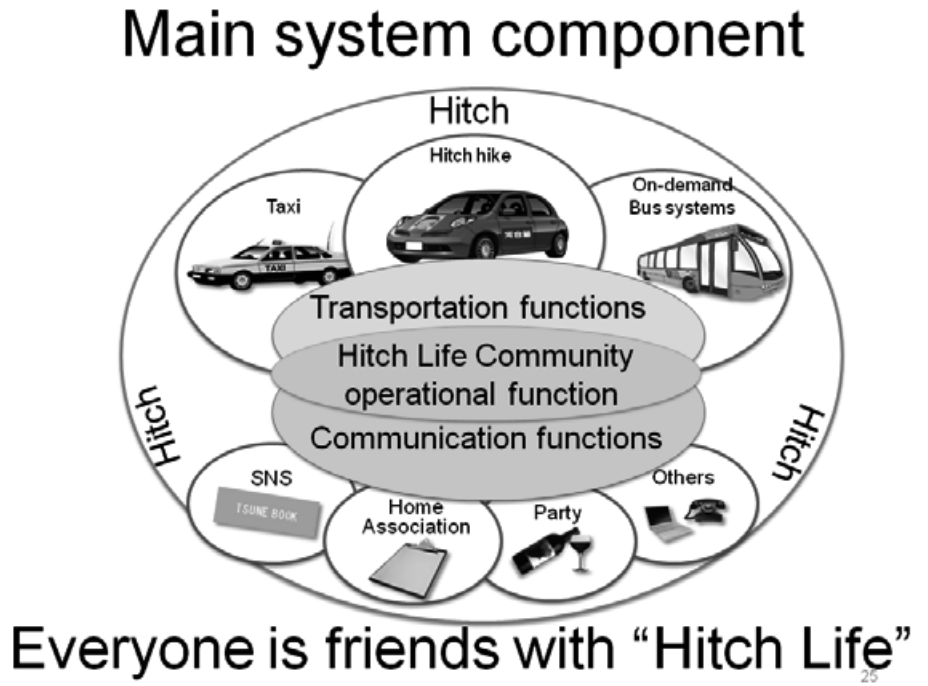

Fig. 5-4　Conceptual Overview of Tsuneishi Hitch Life System

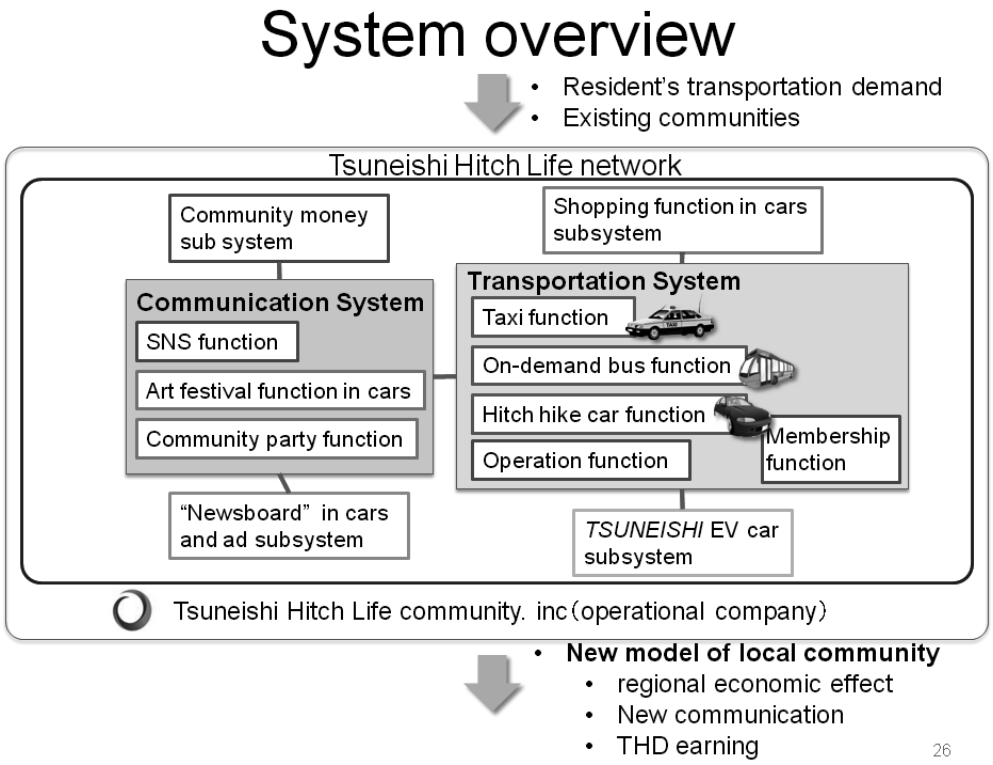

Fig. 5-4 System Overview of Tsuneishi Hitch Life System

The following is a short description of Hitch-Hiking usage, which is the core concept of the system.

- User (needs registration, needs fee)

  A user can subscribe the system to get a user card.　By presenting the card to a driver and

if negotiation can be made, the user can ride the car. The user can earn usage points, which can be later changed into regional currency.

- Driver (needs registration, no fee)

  A driver subscribes the system and gets a driver card. When a user presents a card to the driver, the user and the driver negotiate the destination. If the negotioation is made, the driver takes the user to the destination.

  A driver can get re-imbursement for car insurance, to promote the usage of the system and to increase safety. The user can earn usage points, which can be later changed into regional currency.

- Tsuneishi Hitch Life System Corporation (Tentative name)

  A company to manage the entire system, including membership management, regional currency management, etc.

- Affiliated Shops

  Tsuneishi area shops participating in this sytem. When a user and a driver shops at one of the shops, they can get discounts. The shops accept regional currency.

- Hitch Life Network

  A social network among participants of the system managed by Tsuneishi Hitch Life System Corporaion. The participants can know each other well. At social events, the participants can sell/buy local products.

1.2. Revenue Model

Qualitative analysis of the revenue model is shown in shown in Fig. 5-5. It should be noted that the system fully utilizes currently available resources (Fig. 5-6) and that the initial investment can be made minimum.

Qualitative Revenue/Expenditure Analysis

Income	Expenditure
Increase in sales of affiliated shops	Partial payment of drivers' car insurance
Increase in the sales of insurance	Membership Management
Increase in the sales of gas	Regional Currency Management
Membership Fee	Reward for Artists who prepare advertisement
Advertisement	Management fee for sales in the car
Commission for sales in the car/social events	Social Event management

1

Fig. 5-7　Revenue model of Hitch Life System

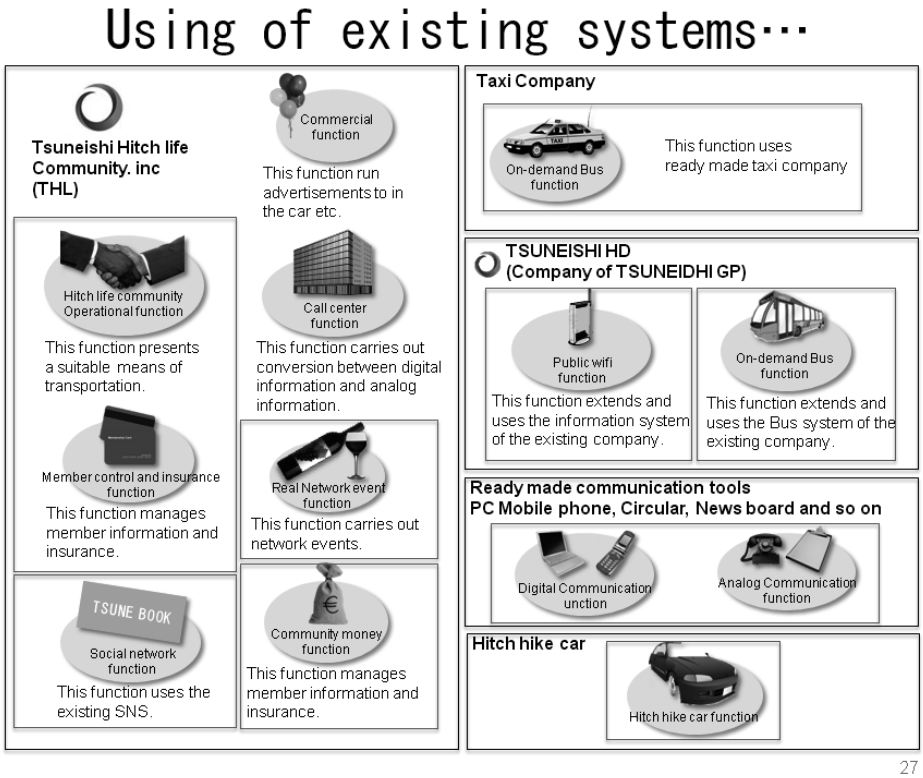

Fig. 5-8　Components available for Hich Life System

1.3. Description of subsystems

This section describes add-on sub systems which make the entire system more attractive and improve profitability.

1.3.1. Sales/Advertisement in the car

This subsystem is intended to promote business in the cars used for hith hiking. Local goods can be sold in the cars and this promotes local-production/local consumption in Tsuneishi area. Advertisement can be made inside the cars. The overview of the subsystem is shown in Fig. 5-7and an example of advertisement in the car is shown in Fig. 5-8.

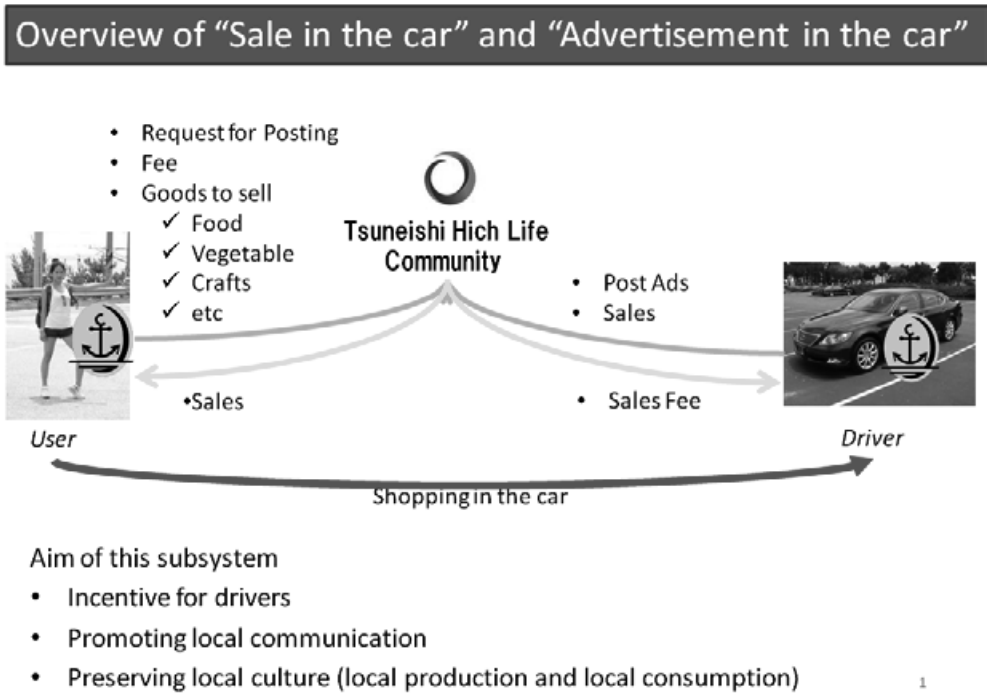

Fig. 5-7 Overview of Sales/Advertisement in the car

Fig. 5-8 Sample of Advertisement in the car

1.3.2. “Art on the car” subsystem

This subsystem is intended to increase revenue by placing artistic advertisement on the cars. This could be more effective if the advertisement is created by younger artist. Such cars with advertisement can be an appealing to wide variety of people and can be an important sightseeing resources. We should also note that this subsystem would supports younger artists’ activity. In addition, if we sell a car with advertisement at a lower price, drivers might be willing to driver such “eye-catching” paintings. The overview of the system is shown in Fig. 5-9.

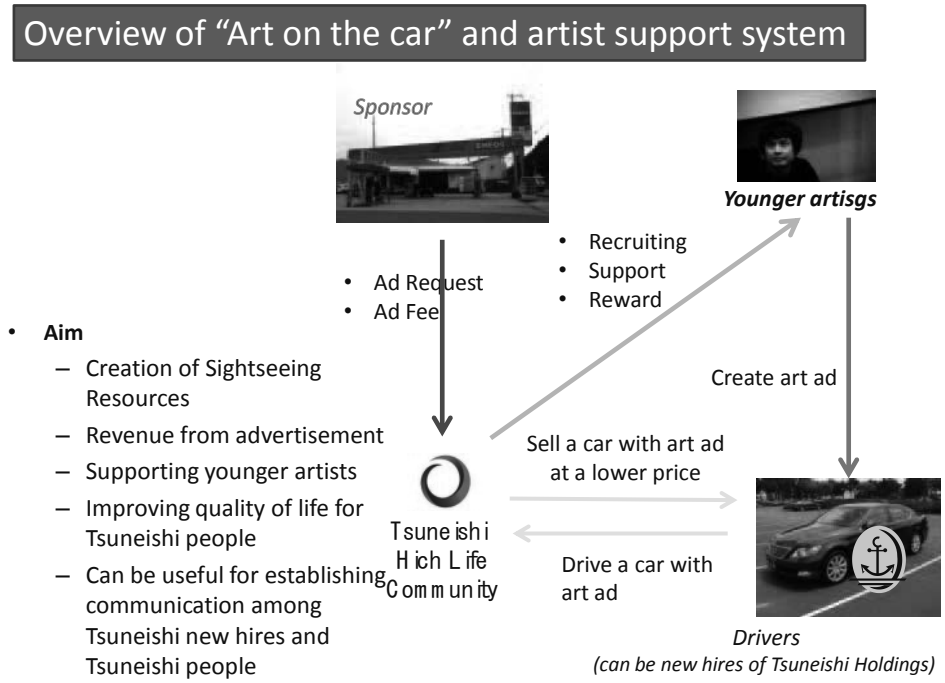

Fig. 5-9 Advertisement System

1.3.3. EV experiments

Tsuneishi holdings is making an intensive experiment on Electric Vehicles. Incorporating those vehicles in the Tsuheishi Hich Life system will be an effective experiment for the entire system. This could also be a good starting point to start exploring “Smart Tsuneishi” with renewable energy.

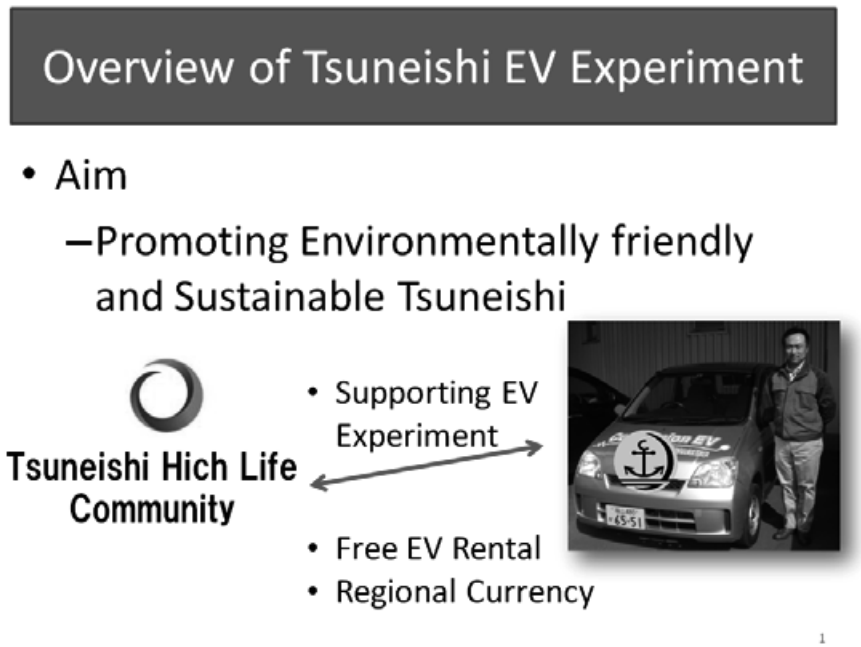

Fig. 5-10 EV experiment

1.4. Cover range of Transportation system

Recomendention System is one of transportation system. The cover range is diceided on User Density and Trip Distance[2], show below fig .

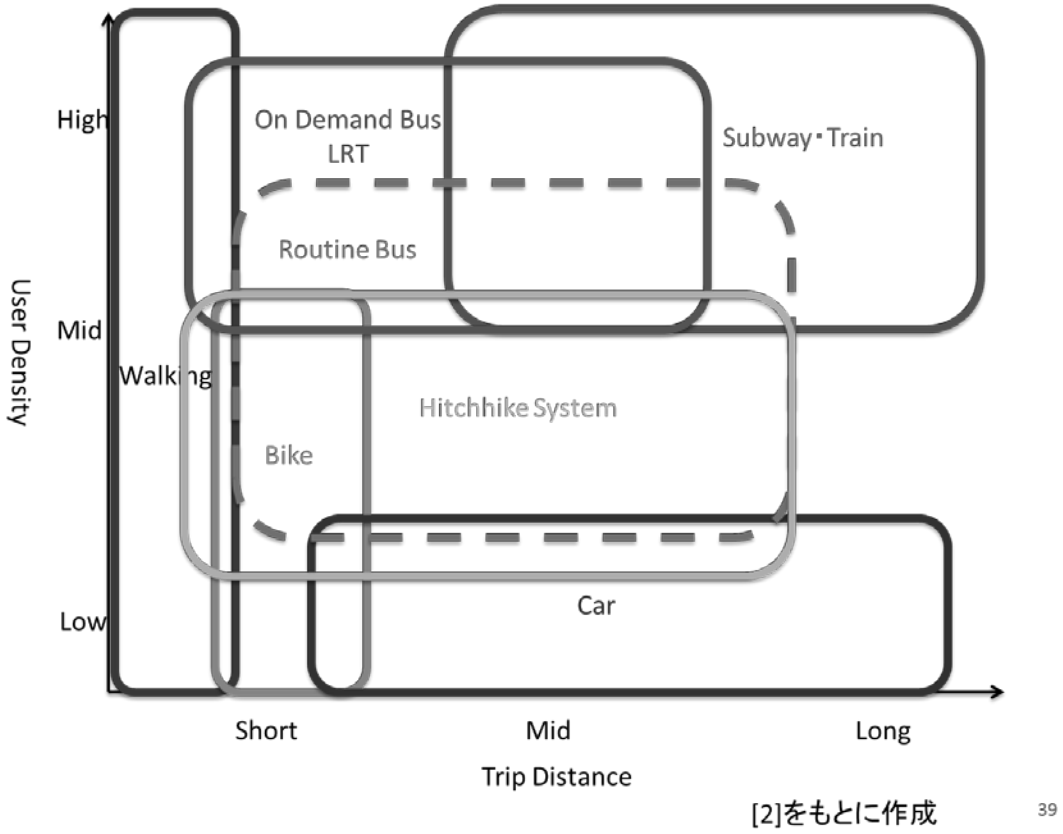

Fig. 5-11 Cover range of Transportation system

6. Competitive Analysis

Our business model is “Public Transportation operated by residents themselves”. Income resources are advertisement revenue and registration fee. The initial cost is very low because we use existing resources such as SNS and the bus already operated inside the Tsuneishi HD factories. Required investments are new local event and issue of local currency. NPV for 5 years is 144,691yen. Our systems main goal is Tsuneishi area revitalization and required cost structure is balance of income and expense. Result of NPV analysis shows that our proposed system satisfied our criteria.Table: NPV analysis

Table 6-1 NPV

Cash Flow						
year	1	2	3	4	5	
income						
Ad revenue	240000	500000	1000000	2000000	4000000	
Registration Fee	48000	100000	200000	400000	800000	
outcome						
SNS (e.g.Facebook) +Kairanba	0	0	0	0	0	
Local event	100000	100000	100000	100000	100000	
Changing Local Currency	259200	540000	1080000	2160000	4320000	
						NPV
	-59333.33333	-27777.8	11574.07	67515.43	152713.5	144691.9

Table 6-2 forecast assumption

Registrant	1000 members(30% of thepopulation) for 5 years
Ratio of car holders	80%
Use frequensy	120 freq/year･person
Amount of Local Currency	21600yen/year･person
Ratio of Localcurency used	25%
Ratio of cooprater Ad car	5%

7. ALPS Roadmap and Reflections

Our roadmap is following: Fig. 7-1.

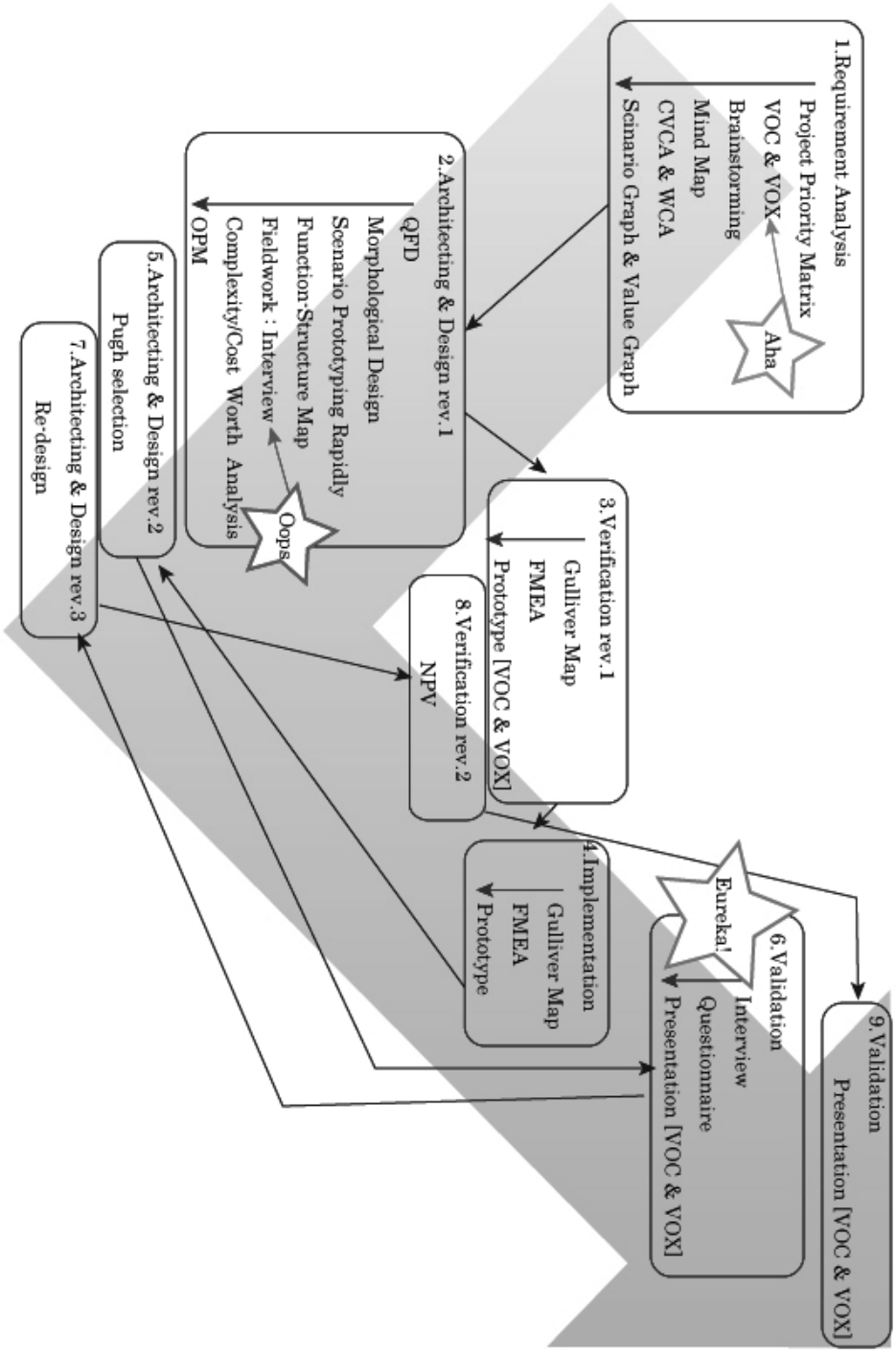

Fig. 7-1　Roadmap of ALPS tools

First, we got requirement analysis. Before VOC & VOX, we thought if we create communities with diversity, *Tsuneishi* community will revitalize. From VOC & VOX, we found out that there are 4 problems to revitalize the *Tsuneishi* communities. The

problems are lack of “Transportations, Shopping, Educations, and Land Usage”, not only about population decreases or less diversity. This is our “Aha” experience.

In the process of “2 Architecting & Design”, we felt Oops from fieldwork. There are lots of existing assets, so we tried to use these: the local communities, public hall and services. From this, we can reduce our initial costs. And the transportation problem is the biggest one; we designed our system focused on “Transportation”.

Finally, we found out! There is fifth problem, lack of “Communication”. This is our Eureka experience. So we re-designed the system focused on “Communications and Transportations”.

We re-designed our system for several times, so we re-acted process 6 to process 7 for several times.

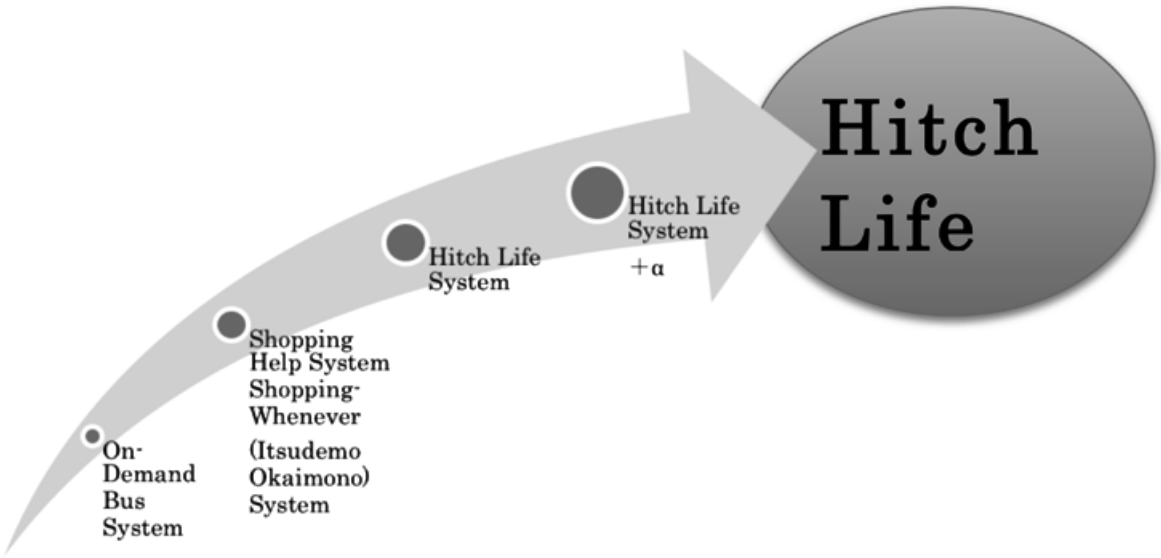

Fig. 7-2 the history of our system

Table 7-1 difference of each systems

	traffic	shopping	education	space	communication
On-Demand Bus	○			○	
Shopping-Whenever	◎	○		○	
Hitch Life	◎	○		○	○
Hitch Life Community	◎	○	○	○	◎

We changed our system about transportations for 4 times.

First, we designed “On-Demand Bus” system. Using this system, we don’t have to use a car, so we thought the space of car parks can reduce. But from the voice of *Tsuneishi* people, shopping problems are needed to solve.

We improved our system to “Shopping Help System- Shopping Whenever”. We could solve the shopping problem from this, but this system didn’t have enough sustainability. It is unprofitable.

We improved to “Hitch Life” system. This system solves “Communication” problems. But we thought the communications will not be active so decided to change again.

Finally we arrived to “Hitch Life Community” system. We took “Pugh concept selection” and joined our systems.

8. Conclusion

We proposed the new system make Tsuneishi HD sustainable for 100 years with TSUNEISHI region and residents, covers following two points.

- Our proposal is Regional revitalization of the TSUNEISHI area.
  - We proposed “Hitch-Life Community” systems
  - We strategically architected subsystems such as EV experiment, Regional Currency, in car “News board” community
- Our proposal which are NOT “policy without software (ハコモノ)” and “technical unbalance (技術偏重)”
  - We recovery and sustain “relationship” (=social capital)
  - Our proposal is Global innovation not from the Tokyo but from TSUNEISHI.
  - Our proposal is towards the global level trendsetting center of art or EV technology.
  - In our proposal Transportation and Communication together support to solve issue.

9. Future Work

We carry out questionnaires survey to have a response from *Tsuneishi* people.150 people answered. From this questionnaires, we understood Tsuneishi residents need to revitalize the Tsuneishi area and most important problem is transportation. So our system’s target is correct. But we also understood our system has some problems such as safety. In order to realize our system, strengthening an insurance system or strengthening the means for activation of communication are required.

Q. Do you think *Tsuneishi* have to revitalize the communities?

A. Over 80 % people thought they need to revitalize their community.

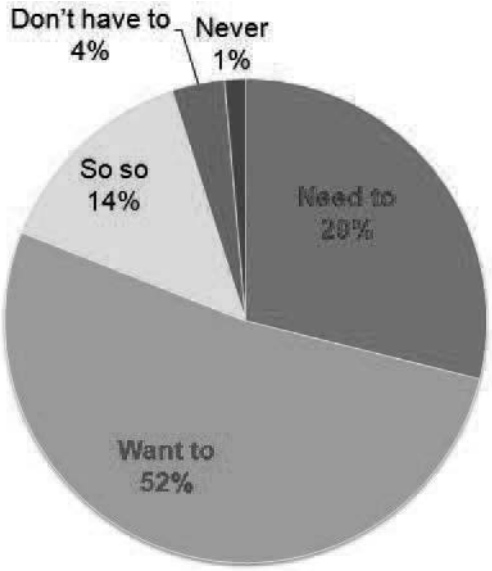

Fig. 9-1 Do you think …?

Q. What do you want? What facts is lack to revitalize *Tsuneishi* community?

A. Transportation is most needed. But from the Interview, we found out communication is most needed in deep layer. So we tried to build the system which focused on transportation and communication.

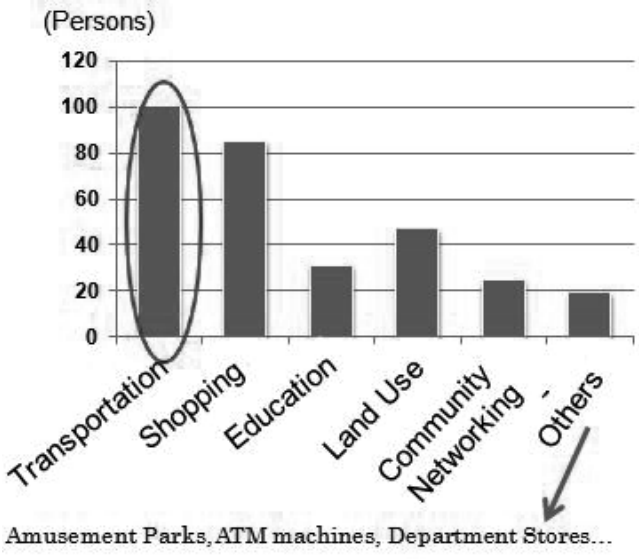

Fig. 9-2

Q. Why don't want to use?

A. The drivers are afraid of their safety. So we tried to develop the system which all people can feel safe.

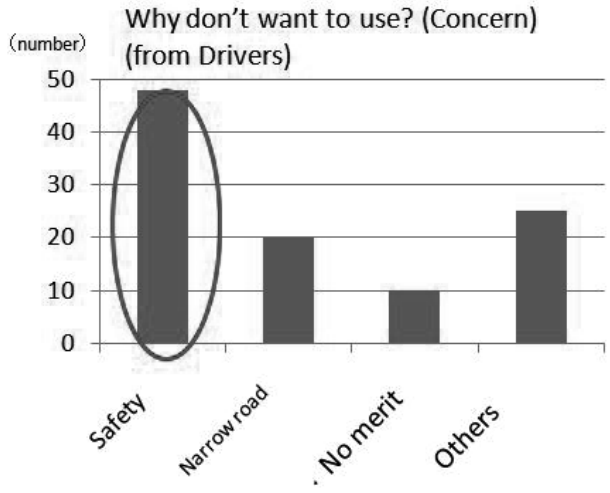

Fig. 9-3

Q. When do you want to use?

A. Almost people ansewed they want to use instead of public transportation service: when go to school, shopping or hospital. And they answered they want to use this system for 1 time per week.

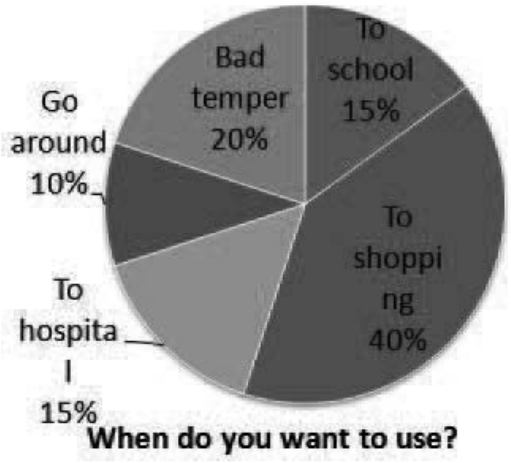

Fig. 9-4

Fig. 8-5 is 100 year grand design for TSUNEISHI Area. In terms of 5 problem, we propose ideal situation for TSUNEISHI area. We hope our proposal become trigger of TSUNEISHI development.

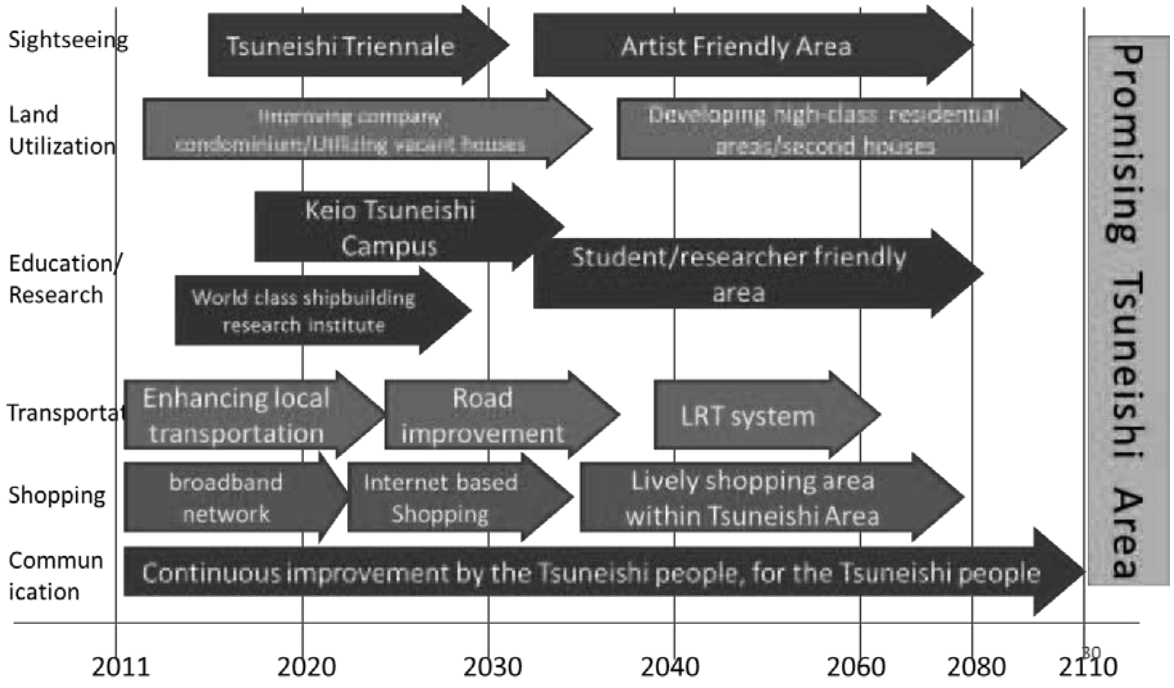

Fig. 9-5. 100 year grand design for TSUNEISHI Area

Summary of proposal so far

Acknowledgment

Tsuneishi Holdings has been always supporting us during the project. We would like to thank President Kambara for proposing the project topic. In particular, we would like to thank Mr. Kanemasa, Ms. Imoto, Ms. Ikeda, Mr. Yamamoto and Mr. Watatani, who have been always with us at ALPS workshops and while we visited Tsuneishi. Thanks are also to Tsuneishi people, including Tsuneishi community center, who helped us understand Tsuneishi well and spent lots of time discussing isses in Tsuneishi. SDM people, particularly Assitant Professor Tohse and Professor Yasui, gave us insightful comments and support. We would like to express our deep gratitude for all who helped us.

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７．　Ministry of Land, Infrastructure, Transport and Tourism：http://www.mlit.go.jp/

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Appendix

This is our system's usecase.

Use scenario

Passengers registration

1. Passengers apply for this system and be evaluated.
2. Passengers apply for insurance for some trouble.
3. If accepted, passengers receive Members card and start to use this system.

Driver registration

1. Drivers apply to this system and be evaluated.
2. Drivers apply for insurance for some trouble.
3. If accepted, drivers receive Members card and start to use this system.

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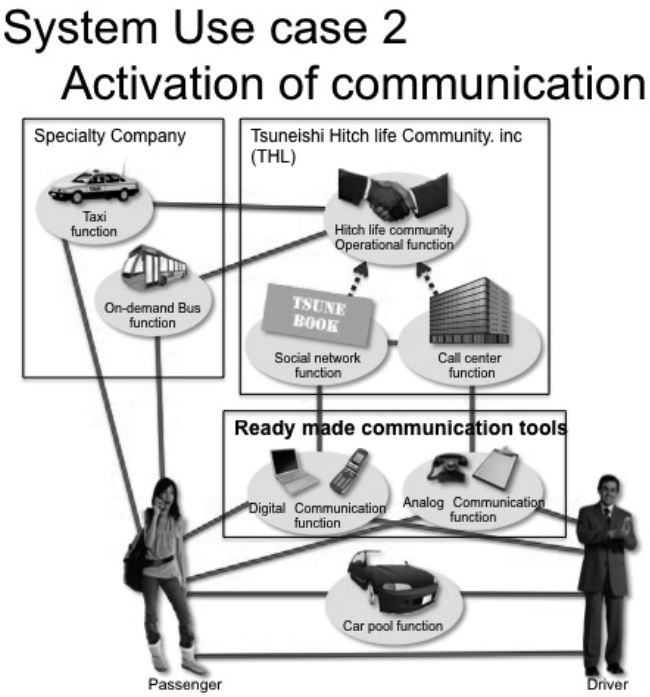

Use scenario

Passengers

1. Passengers offer to use transportation via PC or phone or circular and so on to THL.
2. THL look for appropriate transportation for passengers.
3. THL advance appropriate transportation and tell passengers meeting point.
4. Passengers use transportation advanced

Drivers

1. Drivers are offered to take on passengers by THL and THL tell drivers meeting point.
2. If drivers assented, drivers go to meeting point take on passengers.

(As is obviously, passengers can also use Hitch hike directly)

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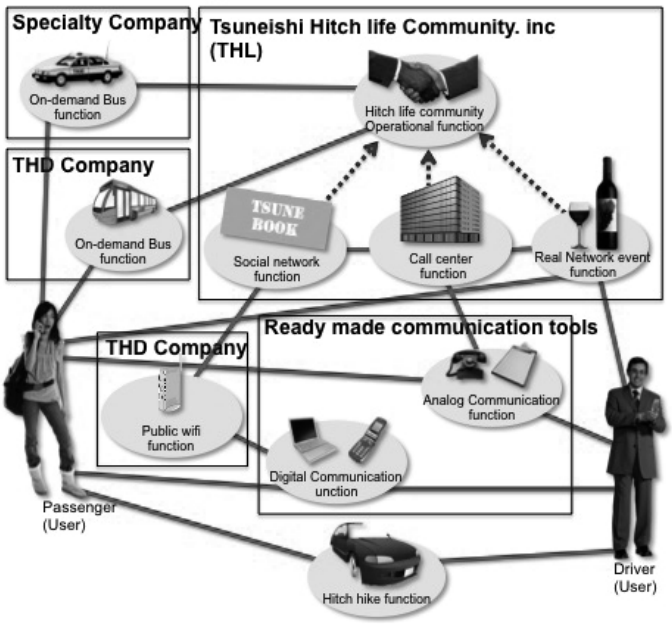
System Use case 3
Transportation



Use scenario

COM between SNS and Real

(For example other generation communication)

1. User write some message to other users on SNS(or other digital tool).
2. Call center translate to Analog com tool(phone, circular or notice board and so on)
3. User can communicate with Analog tool user
4. And If User want to directly meet to communicate with other user, User can use transportation of this system.
5. And THL also introduce appropriate person you want

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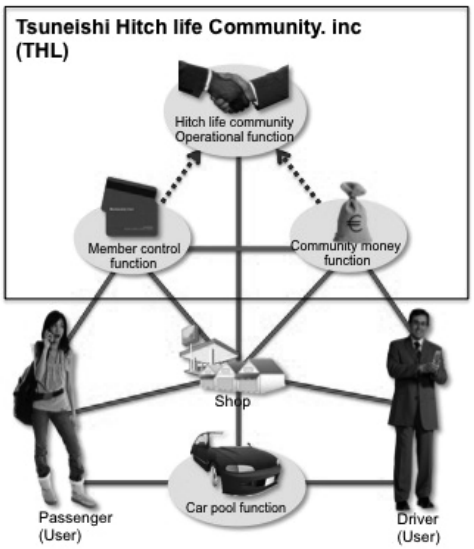
System Use case 4

Use as a mean of shopping use case
Incentive for User



Use scenario

Receive Community money

1. When driver took on passenger, deriver receive Community money from THL.
2. Community money is saved in user's account.
3. Driver can use Community money at shop in Tsuneishi region.

Sales aboard a car

1. Shops in Tsuneishi region offer to sell something to THL.
2. THL offers to sell something to drivers.
3. Drivers sell something to passengers.

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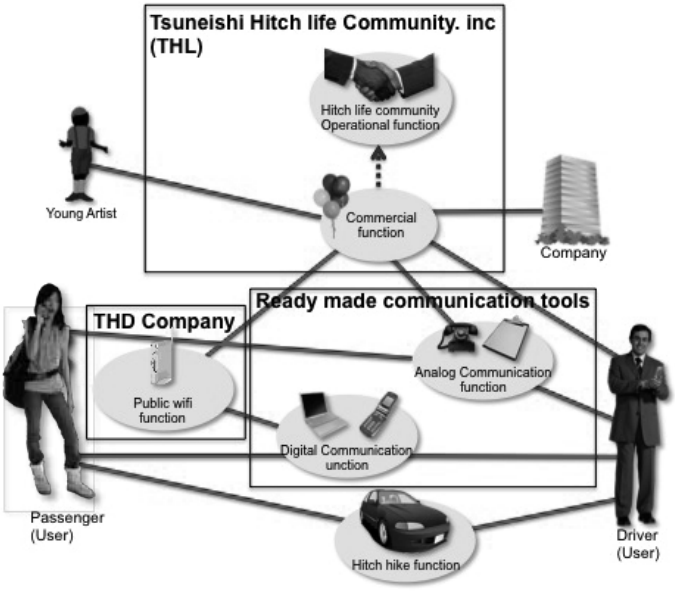
System Use case 5

Use as a source of earnings use case
Incentive for TSUNEISHI GP



Use scenario

Run the advertisement

1. THL is accepted an order about commercial from company wants to merchandise.
2. THL orders the advertisement to young artist and so on.
3. THL orders to run the advertisement to users(for runing the advertisement in the car or outside car), Analog communication tools(circular and so on), Digital communication tools(start page of wifi internet and so on)

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Group M’s Final Presentation Slides

The Voyage

for the Next 100 Years

～To revitalize the *Tsuneishi* community～

～**EN-gine** to Sail for the Coming Chartless Century～

"EN-couragement, EN-gagement, EN-powerment"

Endeavor for Empathy endues the Community-Enhancement.

E.IKEDA, K.TANAKA, S.SUZUKI,
T.HARADA, Y.YAMAMOTO, A.ATARASHI
Keio University / Graduate School of System Design and Management

Contents

- History of the our project
  - The requirements…
  - What we have done is…
  - What is the issues of *Tsuneishi*?
    - From the Interviews ~what do they want?~
    - From the questionnaires ~what do they want?~
  - The system to solve the problems
    - …
- To solve the issues
  - The details of new system
    - Overview/CONOPS
- For next 100 year
  - Conclusion

The requirements

・How to produce synergy effects and activate the social life in the local area?
（共力: Synergy）

・How to inspire the local people to join the project? （共生: Symbiosis）

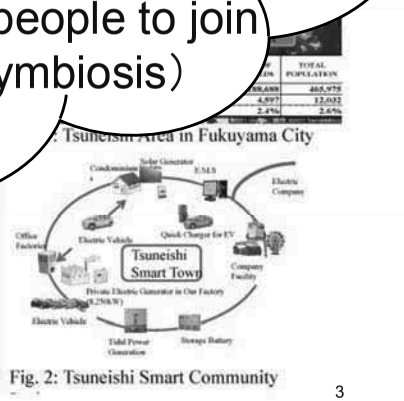


Fig. 2: Tsuneishi Smart Community

What we have done is...

6 visits to Tsuneishi !!

- **June**
  - Our project started
- **July**
  - 1st VOC
    - Found out the 4 issues (transportation, shopping ,education ,land use) to solve.
- **August**
  - Show our prototype 1st : Restructured new system.
  - 2nd VOC : Found out the fifth issues >> lack of communication.
- **September**
  - 3rd VOC
  - Show our prototype 2nd : Re-designed new system.
- **October**
  - Questionnaire to *Tsuneishi* citizen and *Tsuneishi* member.
  - Re-designed the new system.
- **November**
  - Had a presentation to the *Tsuneishi* HD and *Tsuneishi* citizen.
    - Re-designed the new system.

From the interviews…

We figured out the **NEEDs** to revitalize the *Tsuneishi* communities.

- Target
  - Citizen and *Tsuneishi* member
- Time
  - From July,2011 to October,2011

Interviewed stakeholders	number
Citizen (Adult) at *Tsuneishi*	30
Citizen (Child) at *Tsuneishi*	15
Tsuneishi HD Executives	30
Officer of the *Fukuyama* City Government	2
Officer of the *Hiroshima* Prefecture Government	1
Officer of the *Kashiwazaki* City Government	1
Others	10

Voice of Customer… part1

<<transportation>>

- Difficulty in going to school
  - Too expensive
  - Poor transportation
    - Don't come at short intervals
    - Finish early
- Need a car to go around
- Traffic jam
- Bad manner at driving
- Road isn't good at driving : narrow road
- Dark road

<<shopping>>

- Can't do shopping with a light heart
  - Have to take a vehicle
- Main shopping center is located at center city
- Not easy at bringing the package for elder people
  - Elder people live in mountainous region
- Using COOP
  - Can't decide the menu from day to day
- Using shopping help bus
  - Weak sustainability

<<education>>

- Poor level at learning
  - Few school left
    - Students decrease
  - Top level school is only located at *Fukuyama* city center
- Few space at playing outdoors

<<land usage>>

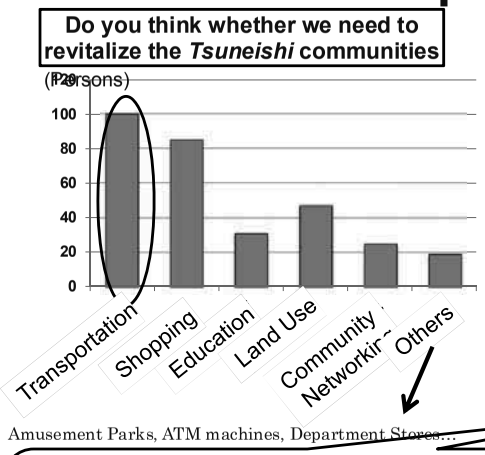
- Hang on their premises
  - Newcomer can't live
- Few space left to park
- Poor sewage improvement
- Poor condition
- Good temperature to live

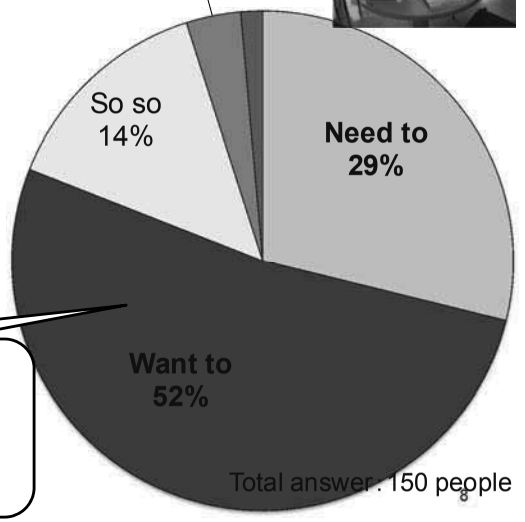
Voice of Customer… part2

<<communication>>

- Poor communication : generation gap
- Information about *Tsuneishi*
  - Want more information from *Tsuneishi*
- Young people don't join in the event at *Tsuneishi*…
- We use "Shopping-Support Bus (*Kaimono Shien Bus*)" to communicate with the others.
  - Want more opportunity to communicate.
- Should use community center.
  - Want young people and *Tsuneishi* member to come…
- Want a opportunity to exchange of opinions with *Tsuneishi* member.

From the questionnaires…





Over 80% people think they have to revitalize their communities.

What we found from there is...

- From the interview…
  - Their needs !! **traffic problems** and **communication**
- From the questionnaires…
  - The traffic problems are 1st needs.

What we found from there is...

- From the interview…
  - Their needs !! **traffic problems** and **communication**

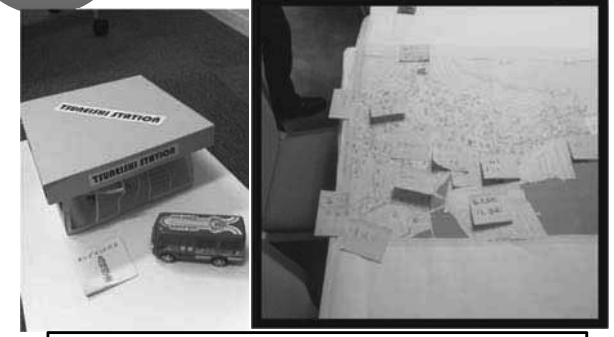
Transportation and Communication are core issue!!

The history of our system

August version 1

Discuss the bus stop location with *Tsuneishi* people

On-Demand Bus System



Prototype of On-Demand Bus System

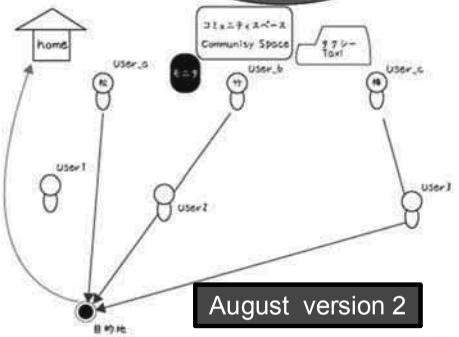
The history of our system

We solved shopping issues

Shopping Help System Shopping-Whenever (いつでもお買いもの) System

On-Demand Bus System

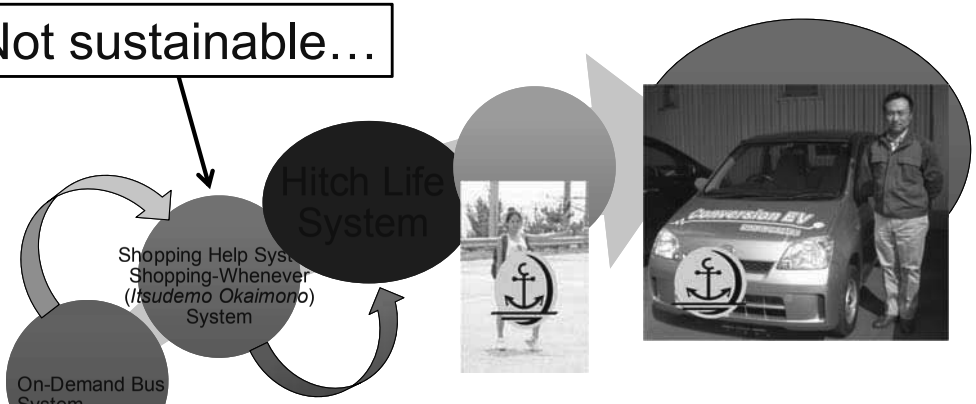
Not profitable…



August version 2

The history of our system

Not sustainable…

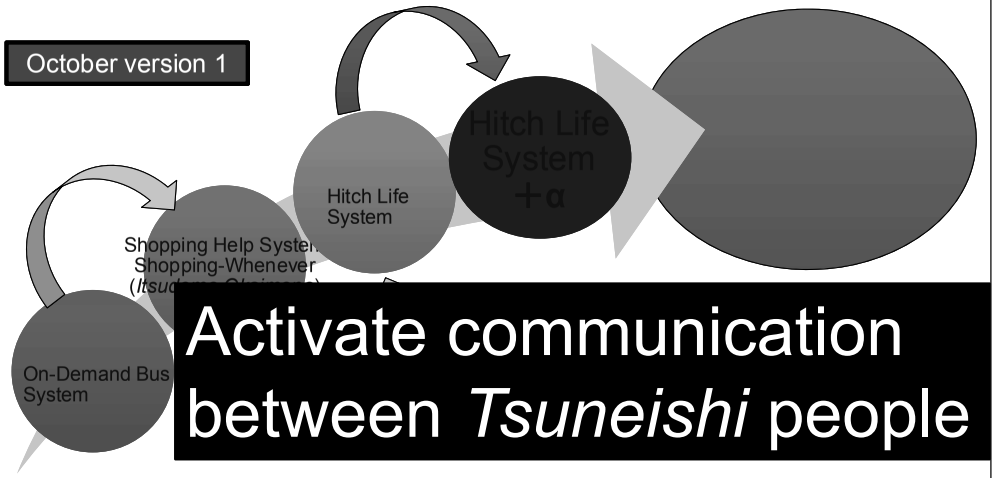


Profitability improved!!

September version 1

The history of our system

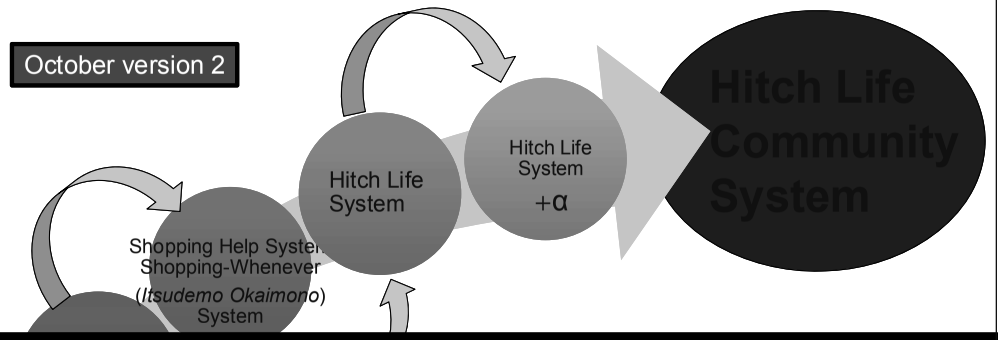
October version 1



Activate communication between *Tsuneishi* people

The history of our system

October version 2



Designed the system which :
1.promotes communication with each others
2.is sustainable

The history of our system

Design the system to solve all 5 issues

	traffic	shopping	education	space	communication
On-Demand Bus	○			○	
Shopping-Whenever	◎	○		○	
Hitch Life	◎	○	○	○	○
Hitch Life +α	◎	○	○	○	◎

Hitch Life Community System

[redacted]

Validation of Proposed System

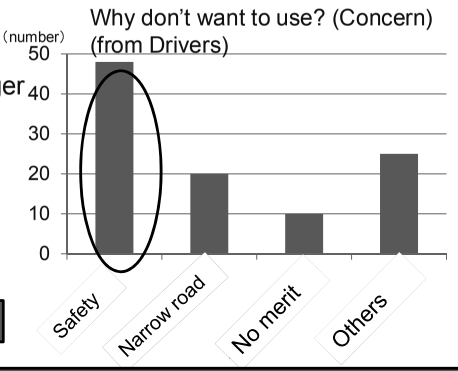
Results :

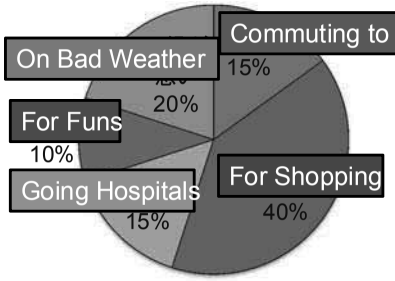
☆Driver's view

- **Safety** : Don't want to drive with stranger
- Heavy workload… (Mental and task)

☆Passenger's view

- Don't need; we have own car
- Too **far** to meeting place





When do you want to use?

Found: If it's **safe**, users want to use system

Issue: How to ease driver's workload

Feed back from *Tsuneishi*...

- Comments on **Hitch Life Community System**
  - Idea is good but…lack of details.
    - Sustainability…?
    - Who use this system…?and how many ?
      - Most of *Tsuneishi* people are senior (not enough drivers)
    - How to communicate with each others…?

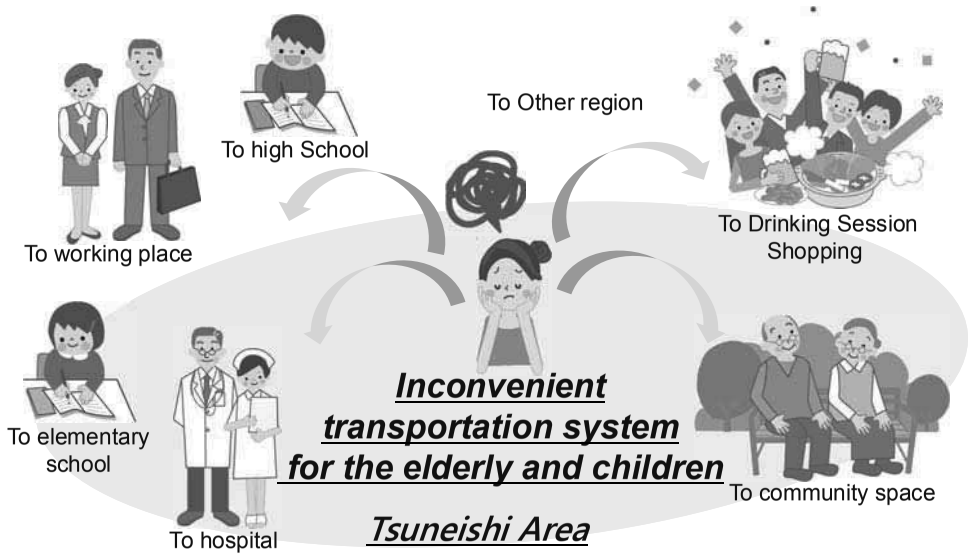
Feed back from *Tsuneishi*...

- Comments on **Hitch Life Community System**
  - Idea is good but…lack of details.
    - Sustainability…?

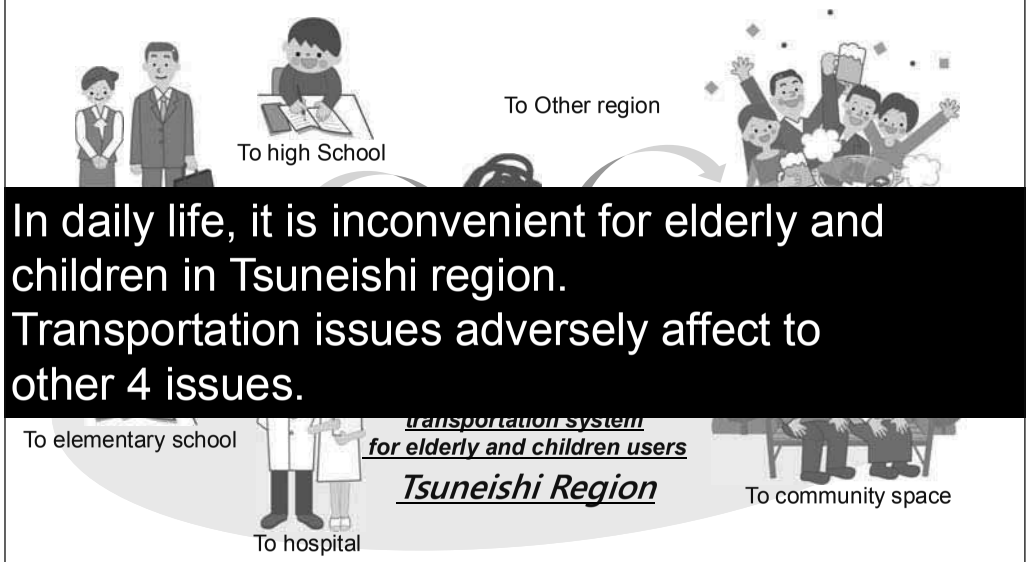
So we re-designed our system…

      - Most of *Tsuneishi* people are senior (not enough drivers)
    - How to communicate with each others…?

"As is" situation from VOC

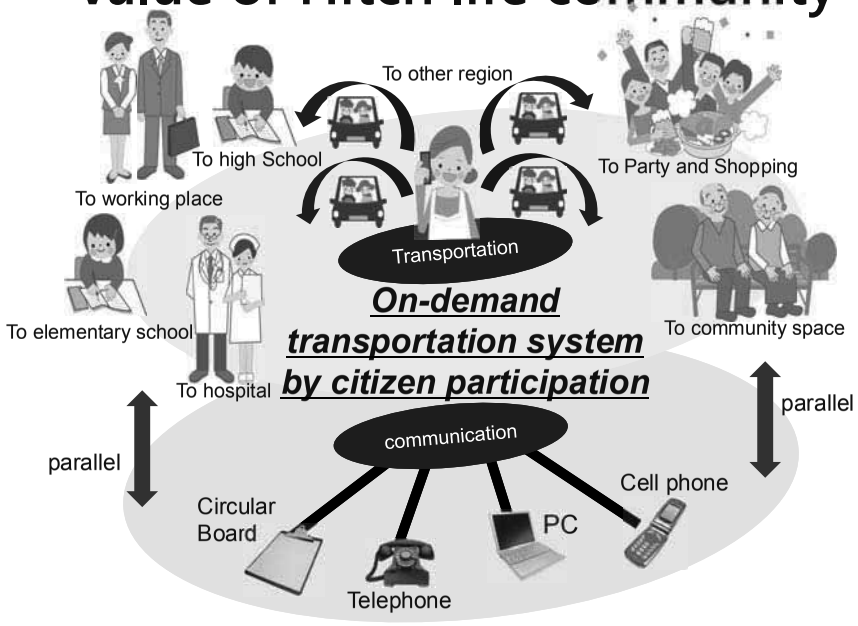


"As is" situation from VOC

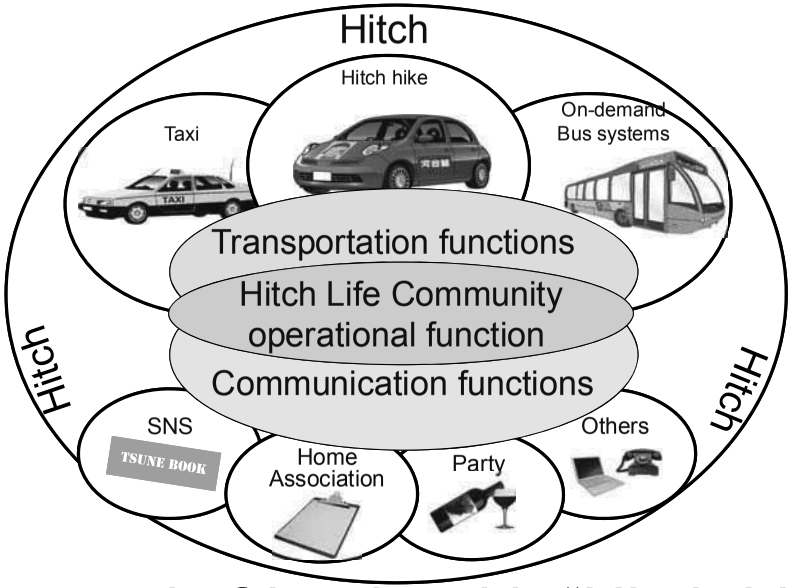


In daily life, it is inconvenient for elderly and children in Tsuneishi region.
Transportation issues adversely affect to other 4 issues.

"To be" situation
Value of Hitch life community



Main system component



Everyone is friends with "Hitch Life"

System overview

- Resident's transportation demand
- Existing communities

Tsuneishi Hitch Life network

Community money sub system

Shopping function in cars subsystem

Communication System

SNS function

Art festival function in cars

Community party function

Transportation System

Taxi function

On-demand bus function

Hitch hike car function

Operation function

Membership function

"Newsboard" in cars and ad subsystem

TSUNEISHI EV car subsystem

Tsuneishi Hitch Life community. inc（operational company）

- **New model of local community**
  - regional economic effect
  - New communication
  - THD earning

Using of existing systems...

Tsuneishi Hitch life Community. inc (THL)

Hitch life community Operational function

This function presents a suitable means of transportation.

Member control and insurance function

This function manages member information and insurance.

TSUNE BOOK Social network function

This function uses the existing SNS.

Commercial function

This function run advertisements to in the car etc.

Call center function

This function carries out conversion between digital information and analog information.

Real Network event function

This function carries out network events.

Community money function

This function manages member information and insurance.

Taxi Company

On-demand Bus function

This function uses ready made taxi company

TSUNEISHI HD (Company of TSUNEIDHI GP)

Public wifi function

This function extends and uses the information system of the existing company.

On-demand Bus function

This function extends and uses the Bus system of the existing company.

Ready made communication tools
PC Mobile phone, Circular, News board and so on

Digital Communication unction

Analog Communication function

Hitch hike car

Hitch hike car function

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Hitch hike car

Hitch hike car function

So, Feasible and Low Development Cost

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Taxi Company

For example

Covoiturage.fr N°1 du covoiturage

Yamamoto-san

Covoiturage

"Co(cooperation)+Voiture(car)+Voyage (trip)"

In this system, the user can find a hitchhike partner easily on the Internet.

Number of user
1 million domestic user
User 3 major purposes
cheap, ecology, chance to meet

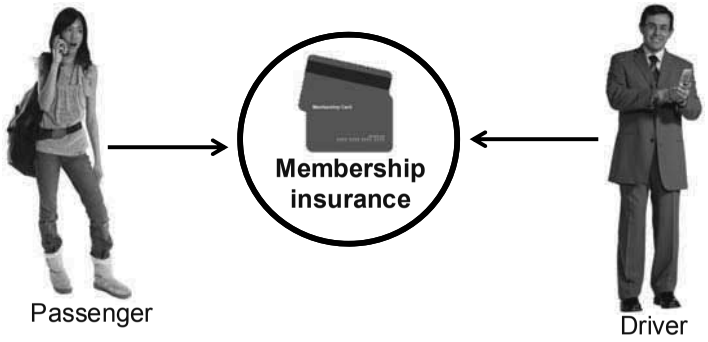
Hitch hike function

Main 4 use scenarios

1. Transportation
2. Member registration
3. Activation of communication
4. Incentives

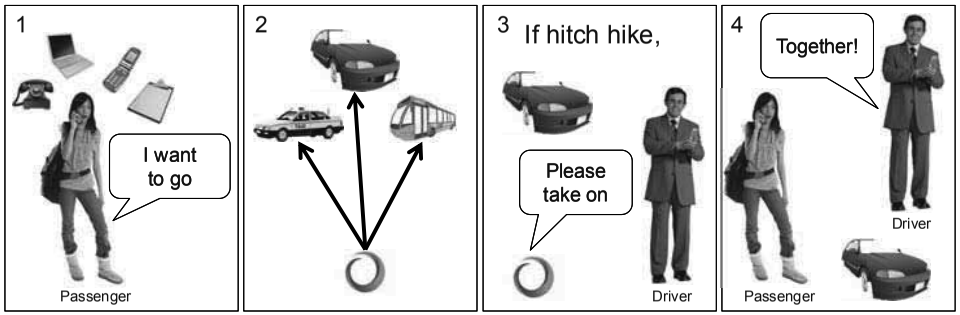
1. Member registration "Safe, Secure, and Reliable"

- **Membership** system build reliability.
- Copes trouble by insurance.



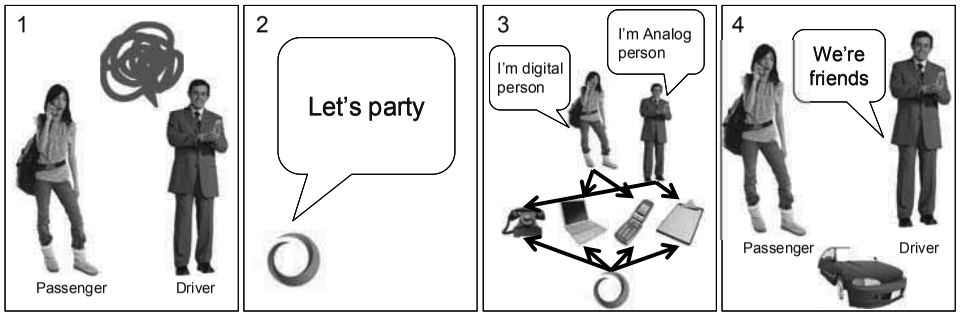
2. Transportation "Low cost and convenient"

- User friendly interface : Multiple choice of communication device.
- Meet their demand : Combination of Taxi, On-demand, and Hitch-hiking
- Cost reduction for *Tsuneishi* group by reducing *Tsuneishi* in-company traffic.



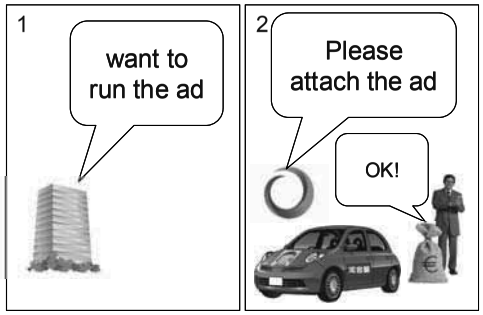
3. Activation of communication "Everyone is friends"

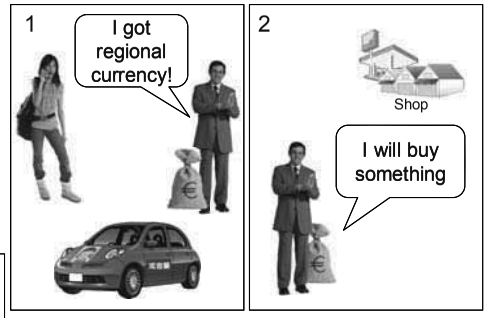
- Activating Communication builds strong ties
  - Activating communications with other generation
  - Networking events



4. Incentive
"This system has many incentives"

- Free of charge for hitchhike
- The driver can get regional currency
- Regional currency activate local economy



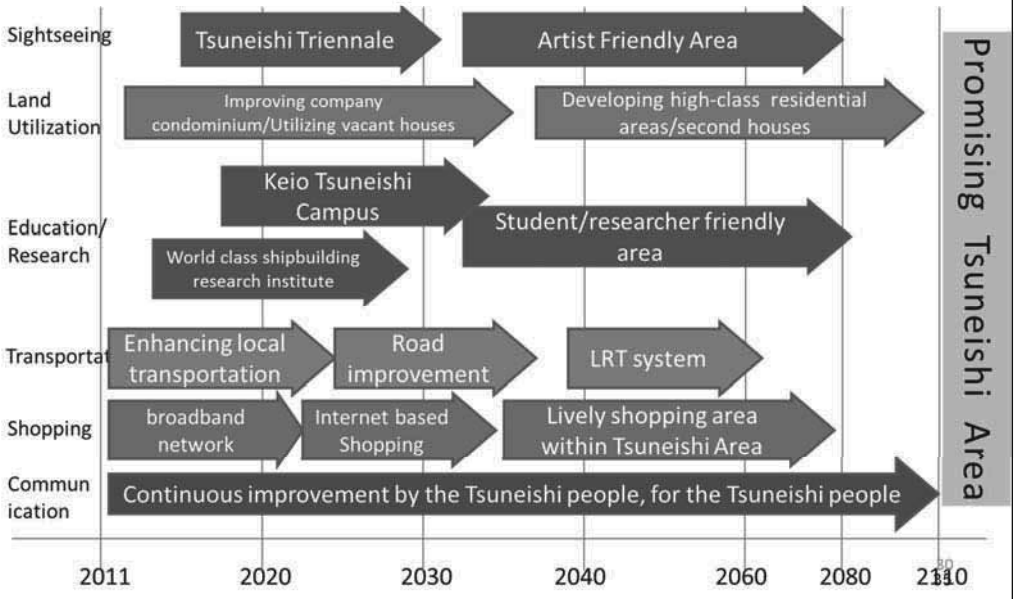


- Other option to enhance sustainability
  - Advertisement(ad)
  - Sightseeing

Summary

- Regional revitalization of the Tsuneishi area
  - Proposed "Hitch-Life Community" system
    - Strategically architected subsystems:
      - EV experiment
      - Regional Currency
      - In car "News board" community
  - Proposal which are NOT "policy without software(ハコモノ)" and "technical unbalance(技術偏重)"
    - Recovery and sustain "relationship" (= social capital)
  - Global innovation not from the *Tokyo* but from *Tsuneishi*.
    - Towards the global level trendsetting center of an art or EV technology
  - **Transportation and Communication together support to solve issues.**

100 years grand design for *Tsuneishi* Area
– Summary of proposals so far –



Acknowledgements

We gracefully acknowledge the valuable co-operations and supports by the *Tsuneishi* HD, the proposer of this project, and all related residents of the *Tsuneishi*

Thank you for your listening !

Special Thanks ?

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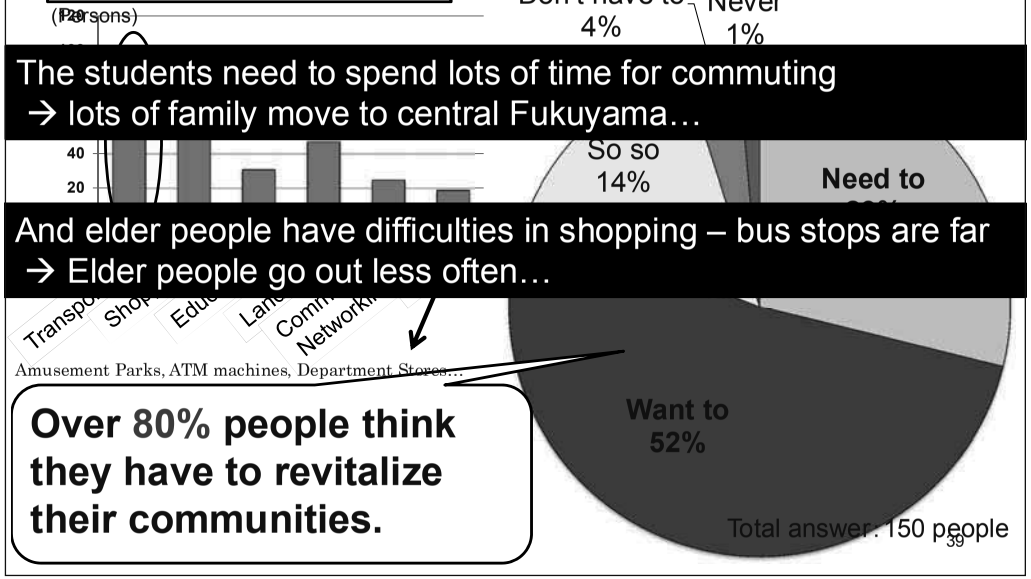
Appendix 1
Detail of Use case

From the questionnaires…

Do you think whether we need to revitalize the *Tsuneishi* communities

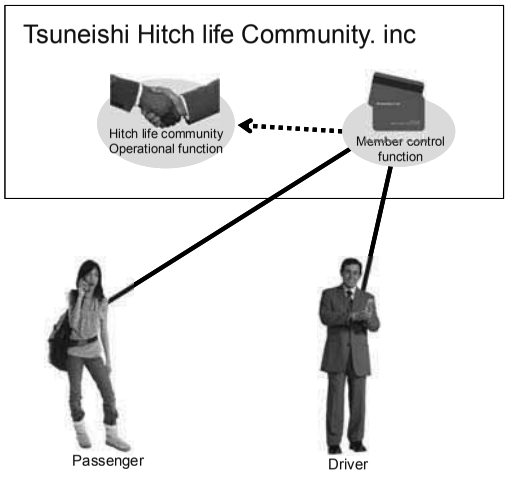


The students need to spend lots of time for commuting
→ lots of family move to central Fukuyama…

And elder people have difficulties in shopping – bus stops are far
→ Elder people go out less often…

Over 80% people think they have to revitalize their communities.

System Use case 1
Member registration



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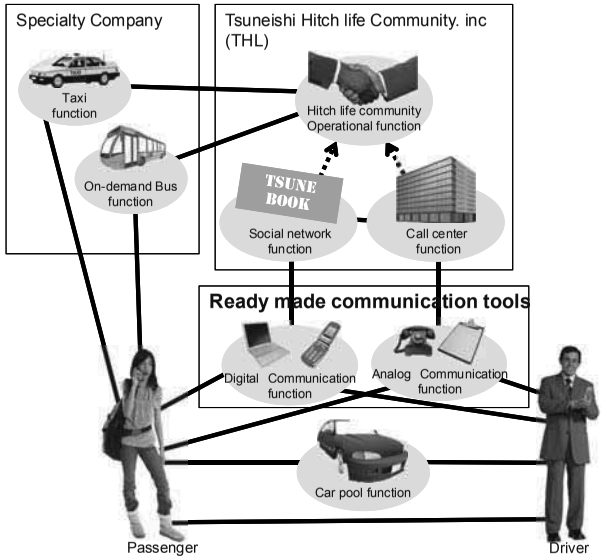
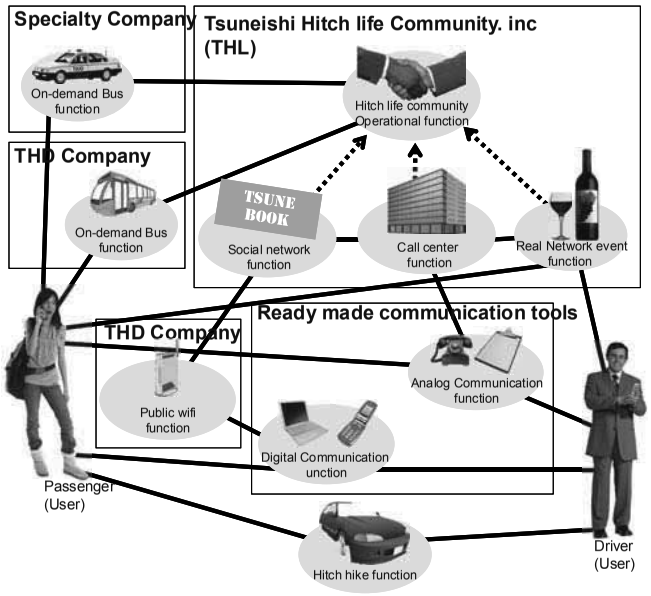
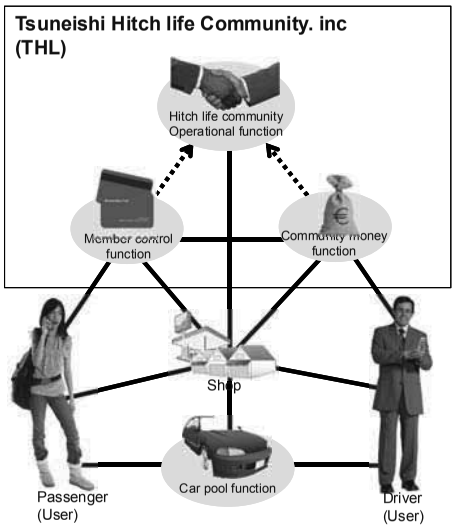
System Use case 2
Activation of communication



System Use case 3
Transportation



System Use case 4
Use as a mean of shopping use case
Incentive for User



System Use case 5
Use as a source of earnings use case
Incentive for TSUNEISHI GP