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# Non-economic benefits of

## standards:

### Case study of the

### Shenzhen Transport

### Commission



Shenzhen Institute of Standards and  
Technology (China)

- Background and objectives of the project
- Four steps to conduct the assessment
- Conclusions of the project

# Background

## Objective

- Assess the non-economic benefits of **Intelligent Public Transportation Dispatch System Standards** used by the Shenzhen Transport Commission

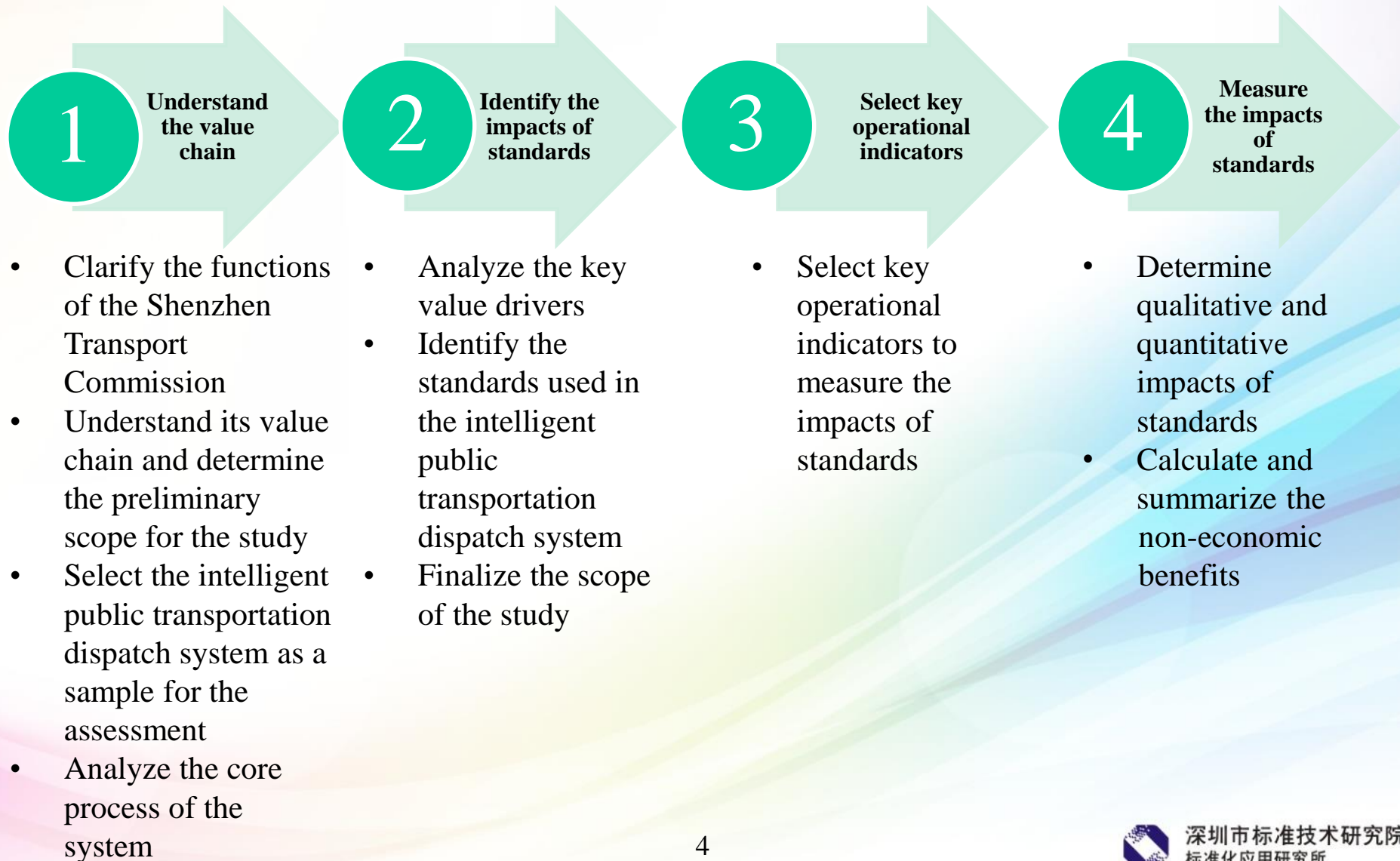
## Approach

- ISO methodology

## Duration

- June to October 2013

# Four steps in the assessment



# Step 1: Analyze the value chain (1)

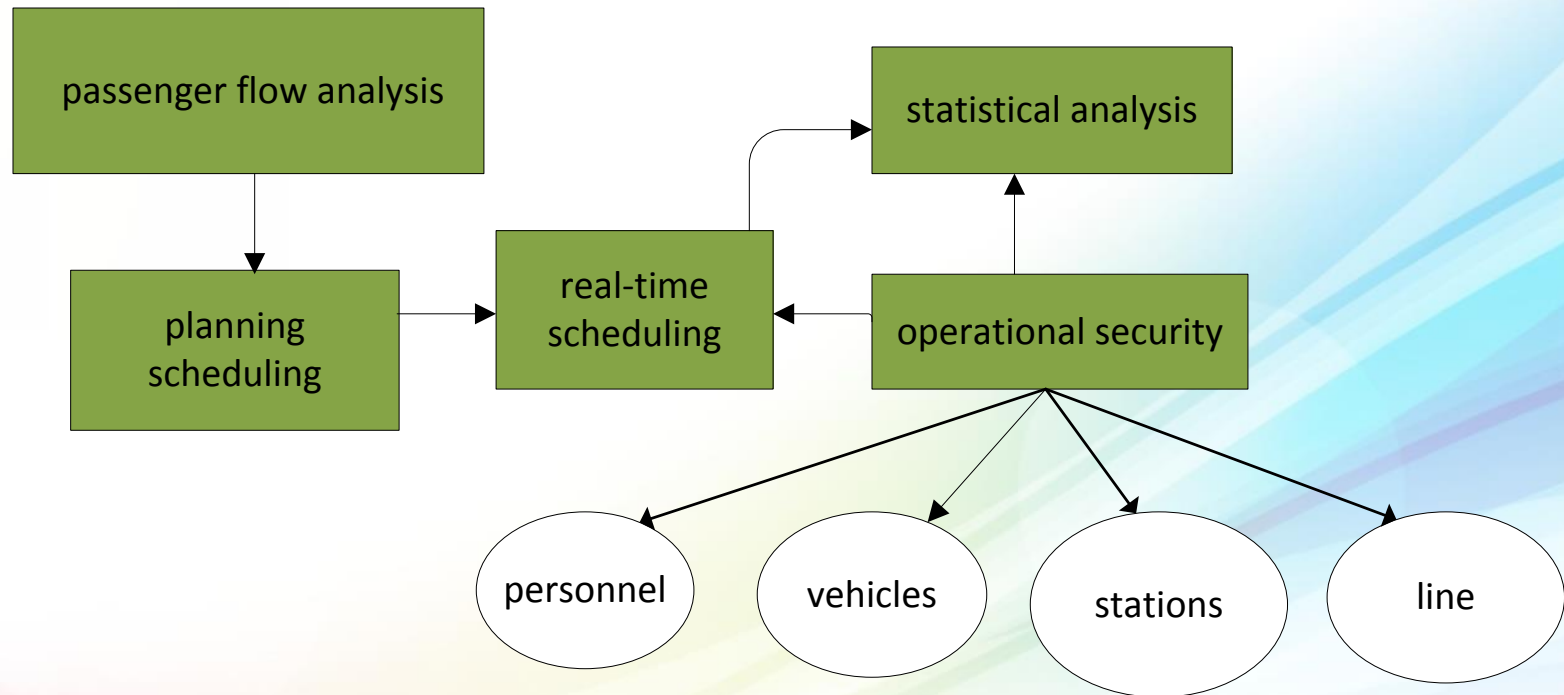
## ➤ Value chain of the Intelligent Public Transportation Dispatch industry

equipment research and development	production	procurement	construction	operation	monitoring	maintenance of equipment
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equipment providers						
system providers						
bus companies						
traffic management departments						

# Step 1: Analyze the value chain (2)

- Core process of the Intelligent Public Transportation Dispatch



## Step 2: Identify the impacts of standards (1)

- Key aspects of the operation and areas of impacts of the standards

Key operations	Description
Operations management	The includes real-time operation dispatching, monitoring management, safety management, station management and emergency control.
Consumer	One of the targets of Intelligent Public Transportation Dispatch system is to facilitate public travel and ensure citizens have a comfortable and satisfying traffic environment.

## Step 2: Identify impacts of standards (2)

### ➤ Main standards used

No.	Business functions	Activities	Standards No.	Titles of Standards
1	Intelligent Public Transportation Dispatch System	Traffic statistics analysis	SZDBZ 30-2010 SZDBZ 35-2011 SZDBZ 36-2011	"Intelligent Public Transportation Dispatch System-Vehicle Dispatch Terminal" "Intelligent Public Transportation Dispatch System-Platform Specification" "Intelligent Public Transportation Dispatch System-Communication Protocol"
2		Planning & scheduling		
3		Real-time scheduling		
4		Operational monitoring		
5		Emergency		
6		Query statistics		
7		Operational decision		
8		Ticket settlement		
9		Operational security		
10		User rights		



# Step 3: Selection of key operational indicators

No.	Operational indicators	Definition of the indicators (before & after the introduction of standards)
1	Dispatch mode	Degree of automation of the dispatching process
2	Operation Management	Degree of real-time monitoring of the operations management vs. ad hoc monitoring
3	Safety monitoring	Degree of safety monitoring of the bus operations remotely through the dispatch platform
4	Operational guarantee	Degree of reliability through operational personnel, vehicles, stations and lines established
5	Operation Condition	Degree of monitoring and control of the operational condition of the buses
6	Regulatory Indicators	Degree of harmonization of the indicators applied by the bus company in data collection assisting the management of the Transport Commission of Shenzhen Municipality
7	Emergency Coordination	Response time and effectiveness of taking emergency measures and coordination of such measures
8	Subsidy support	Provision of solid criteria and transparency in the payments for staff
9	Decision support	Precision of data to support decision-making through a database supporting the decision-making of the Transport Commission of Shenzhen Municipality
10	Quality of service	Service quality, measured as average waiting time of passengers, rate of complaints and overall convenience of passengers to use the bus services

# Step 4: Measure the impacts of standards

## ➤ Qualitative analysis of the impact of standards

No.	Operational indicators	Impacts of standards
1	Dispatch mode	Higher efficiency and degree of automation of the dispatch of the buses
2	Operation Management	Management staff can control operations in real-time
3	Safety monitoring	Management can monitor operations remotely
4	Operational guarantee	Management can guarantee reliable operations of personnel, vehicles, stations and lines
5	Visualization of the operations	Visualization of operations making it easier to understand the operations of the buses and transport conditions in real-time
6	Regulatory Indicators	Consolidation and harmonization of the timing and data collection of traffic conditions
7	Emergency Coordination	Consistency and response times of actions in emergency conditions
8	Subsidy support	Transparency in the payment of subsidies
9	Decision support	Degree of reliability of data for taking management decisions

## ➤ Quantitative analysis of the impact of standards

Assessment aspects	Operational indicators	Quantifying of non-economic benefits	Explanations
Operation	Average # of passengers per month	↑0.92%	Average monthly # of passengers increased by 0.92%.
	Average punctuality of bus departure	↑2%	Punctuality of bus departures increased 1.2%.
	Speed violations	↓9%	Speeding violations decreased by 9% .
	Time required for the preparation of statistics	↓10%	Time savings in preparing statistics by 10% .
	# of staff managing the platform	↓6%	# of dispatchers decreased by 6%
Service quality	Average waiting time	↓3.3%	Average waiting time of passengers decreased by 3.3%.
	Passenger complaints rate	↓2%	Complaint rate of passengers decreased by 2%
	Convenience of passengers	↑5%	Convenience of passengers increased by 5% .

## ➤ Qualitative impacts of standards

- Efficiency in the dispatch operations
- Real-time control operations
- Remote safety monitoring
- Operational guarantees
- Systematic monitoring of key performance indicators
- Evidence-based decision and planning support
- Increase in the determination of the exact amounts of subsidy payments
- Smart coordination of emergency situations

## ➤ Quantitative impacts of standards

- Average monthly number of passengers increased by 0.92 %
- Punctuality rate of bus departures improved by 2 %
- Speeding violations decreased by 9 %
- Time needed for preparing statistics decreased by 10 %
- Number of dispatching personnel was reduced by 6 %
- Waiting time for passengers was reduced by an average of 0.4 minutes
- Passenger complaints decreased by 2 %
- Passenger convenience, based on surveys, was enhanced by 5 %.

# Thank you!