

## Supplementary File

**Manuscript Title:** Shared Mobility Problems: A Systematic Review on Types, Variants, Characteristics, and Solution Approaches

**Table S1.** Summary of Papers based on the Types of SMP

Paper	Ridesharing	Carpooling	Taxisharing	Buspooling	Vanpooling	Multi-Modal
<a href="#">Agatz et al. (2011)</a>	✓					
<a href="#">Aissat and Oulamara (2014a)</a>	✓					
<a href="#">Aissat and Oulamara (2014b)</a>	✓					
<a href="#">Aissat and Oulamara (2015a)</a>	✓					
<a href="#">Aissat and Oulamara (2015b)</a>	✓					
<a href="#">Aissat and Oulamara (2015c)</a>	✓					
<a href="#">Alonso-Mora et al. (2017)</a>	✓					
<a href="#">Armant and Brown (2014)</a>	✓					
<a href="#">Armant and Brown (2020)</a>	✓					
<a href="#">Auad and Van Hentenryck (2021)</a>						✓
<a href="#">Aydin et al. (2020)</a>	✓					
<a href="#">Ben Cheikh et al. (2017)</a>	✓					
<a href="#">Bian and Liu (2017)</a>	✓					
<a href="#">Bian and Liu (2019a)</a>	✓					
<a href="#">Bian and Liu (2019b)</a>	✓					
<a href="#">Bit-Monnot et al. (2013)</a>		✓				
<a href="#">Bruck et al. (2017)</a>		✓				
<a href="#">Cangialosi et al. (2016)</a>						✓
<a href="#">Cao et al. (2021)</a>	✓					
<a href="#">Cheikh &amp; Hammadi (2016)</a>	✓					
<a href="#">Cheikh-Graiet et al. (2020)</a>	✓					
<a href="#">Chen et al. (2019a)</a>	✓					
<a href="#">Chen et al. (2019b)</a>			✓			
<a href="#">Chen et al. (2019c)</a>	✓					
<a href="#">Chou et al. (2016)</a>		✓				
<a href="#">Di Febbraro et al. (2013)</a>	✓					
<a href="#">Du et al. (2016)</a>			✓			
<a href="#">Duan et al. (2018)</a>		✓				
<a href="#">Enzi et al. (2020)</a>						✓
<a href="#">Guan et al. (2020)</a>	✓					

<a href="#">Guo et al. (2013)</a>		✓				
<a href="#">Herbawi and Weber (2011a)</a>	✓					
<a href="#">Herbawi and Weber (2011b)</a>	✓					
<a href="#">Herbawi and Weber (2011c)</a>	✓					
<a href="#">Herbawi and Weber (2012a)</a>	✓					
<a href="#">Herbawi and Weber (2012b)</a>	✓					
<a href="#">Herbawi and Weber (2012c)</a>	✓					
<a href="#">Herbawi and Weber (2012d)</a>	✓					
<a href="#">Hosni et al. (2014)</a>			✓			
<a href="#">Hou et al. (2018)</a>	✓					
<a href="#">Hsieh and Zhan (2018)</a>		✓				
<a href="#">Hsieh et al. (2019)</a>		✓				
<a href="#">Huang et al. (2014a)</a>		✓				
<a href="#">Huang et al. (2014b)</a>		✓				
<a href="#">Huang et al. (2016)</a>		✓				
<a href="#">Huang et al. (2017)</a>		✓				
<a href="#">Huang et al. (2018a)</a>		✓				
<a href="#">Huang et al. (2018b)</a>						✓
<a href="#">Jung et al. (2016)</a>			✓			
<a href="#">Kaan and Olinick (2013)</a>					✓	
<a href="#">Lee and Savelsbergh (2015)</a>	✓					
<a href="#">Li and Chung (2020)</a>	✓					
<a href="#">Li et al. (2018)</a>	✓					
<a href="#">Lin et al. (2012)</a>			✓			
<a href="#">Liu and Liu (2020)</a>				✓		
<a href="#">Liu et al. (2019)</a>				✓		
<a href="#">Lloret-Batlle et al. (2017)</a>	✓					
<a href="#">Long et al. (2018)</a>	✓					
<a href="#">Lotfi et al. (2019)</a>	✓					
<a href="#">Lu et al. (2020)</a>	✓					
<a href="#">Ma (2017)</a>						✓
<a href="#">Ma et al. (2018a)</a>	✓					
<a href="#">Ma et al. (2018b)</a>			✓			
<a href="#">Masoud and Jayakrishnan (2017a)</a>	✓					
<a href="#">Masoud and Jayakrishnan (2017b)</a>	✓					
<a href="#">Masoud et al. (2017a)</a>						✓
<a href="#">Masoud et al. (2017b)</a>	✓					

<a href="#">Massobrio et al. (2016)</a>			✓			
<a href="#">Najmi et al. (2017)</a>	✓					
<a href="#">Nam et al. (2018)</a>						✓
<a href="#">Naoum-Sawaya et al. (2015)</a>	✓					
<a href="#">Pelzer et al. (2015)</a>	✓					
<a href="#">Qian et al. (2017)</a>			✓			
<a href="#">Regue et al. (2016)</a>						✓
<a href="#">Ren et al. (2020)</a>	✓					
<a href="#">Santos and Xavier (2013)</a>			✓			
<a href="#">Santos and Xavier (2015)</a>			✓			
<a href="#">Simonetto et al. (2019)</a>	✓					
<a href="#">Smet (2019)</a>	✓					
<a href="#">Stiglic et al. (2015)</a>	✓					
<a href="#">Stiglic et al. (2016)</a>	✓					
<a href="#">Stiglic et al. (2018)</a>						✓
<a href="#">Su et al. (2019)</a>		✓				
<a href="#">Sun and Zhang (2018)</a>			✓			
<a href="#">Tafreshian and Masoud (2020a)</a>	✓					
<a href="#">Tafreshian and Masoud (2020b)</a>	✓					
<a href="#">Tamannaei &amp; Irandoost (2019)</a>		✓				
<a href="#">Wang et al. (2018)</a>	✓					
<a href="#">Wang et al. (2016)</a>	✓					
<a href="#">Wu et al. (2016)</a>		✓				
<a href="#">Xia et al. (2015)</a>		✓				
<a href="#">Yan and Chen (2011a)</a>		✓				
<a href="#">Yan and Chen (2011b)</a>		✓				
<a href="#">Yan et al. (2011)</a>		✓				
<a href="#">Yan et al. (2012)</a>		✓				
<a href="#">Yan et al. (2014)</a>		✓				
<a href="#">Ye et al. (2015)</a>			✓			
<a href="#">Yu et al. (2019)</a>	✓					
<a href="#">Yu et al. (2020)</a>						✓
<a href="#">Zhang and Zhang (2020)</a>	✓					
<a href="#">Zhang et al. (2019)</a>	✓					
<a href="#">Zhang et al. (2020)</a>			✓			
<a href="#">Zhao et al. (2018)</a>	✓					

**Table S2.** Summary of Papers based on the Problem Variants of SMP

Paper	Riders and Drivers				Origins and Destinations			
	1-1	1-M	M-1	M-M	MO1D	1OMD	MOMD	1O1D
<a href="#">Agatz et al. (2011)</a>	✓							
<a href="#">Aissat and Oulamara (2014b)</a>	✓							
<a href="#">Aissat and Oulamara (2014a)</a>	✓							
<a href="#">Aissat and Oulamara (2015a)</a>	✓							
<a href="#">Aissat and Oulamara (2015b)</a>	✓							
<a href="#">Aissat and Oulamara (2015c)</a>	✓							
<a href="#">Alonso-Mora et al. (2017)</a>		✓						
<a href="#">Armant and Brown (2014)</a>		✓						
<a href="#">Armant and Brown (2020)</a>		✓						
<a href="#">Aydin et al. (2020)</a>	✓							
<a href="#">Ben Cheikh et al. (2017)</a>				✓				
<a href="#">Bian and Liu (2017)</a>		✓						
<a href="#">Bian and Liu (2019a)</a>		✓						
<a href="#">Bian and Liu (2019b)</a>		✓						
<a href="#">Bit-Monnot et al. (2013)</a>		✓						
<a href="#">Bruck et al. (2017)</a>	✓							
<a href="#">Cao et al. (2021)</a>		✓						
<a href="#">Cheikh-Graiet et al. (2020)</a>				✓				
<a href="#">Cheikh &amp; Hammadi (2016)</a>			✓					
<a href="#">Chen et al. (2019a)</a>				✓				

<a href="#">Chen et al. (2019b)</a>							✓	
<a href="#">Chen et al. (2019c)</a>		✓						
<a href="#">Chou et al. (2016)</a>			✓					
<a href="#">Di Febbraro et al. (2013)</a>		✓						
<a href="#">Du et al. (2016)</a>	✓							
<a href="#">Duan et al. (2018)</a>	✓							
<a href="#">Guan et al. (2020)</a>	✓							
<a href="#">Guo et al. (2013)</a>						✓		
<a href="#">Herbawi and Weber (2011c)</a>			✓					
<a href="#">Herbawi and Weber (2011b)</a>		✓						
<a href="#">Herbawi and Weber (2011a)</a>		✓						
<a href="#">Herbawi and Weber (2012d)</a>		✓						
<a href="#">Herbawi and Weber (2012b)</a>			✓					
<a href="#">Herbawi and Weber (2012a)</a>		✓						
<a href="#">Herbawi and Weber (2012c)</a>				✓				
<a href="#">Hosni et al. (2014)</a>		✓						
<a href="#">Hou et al. (2018)</a>		✓						
<a href="#">Hsieh and Zhan (2018)</a>	✓							
<a href="#">Hsieh et al. (2019)</a>		✓						
<a href="#">Huang et al. (2014a)</a>		✓						
<a href="#">Huang et al. (2014b)</a>		✓						
<a href="#">Huang et al. (2016)</a>					✓			
<a href="#">Huang et al. (2017)</a>		✓						
<a href="#">Huang et al. (2018a)</a>		✓						
<a href="#">Jung et al. (2016)</a>		✓						
<a href="#">Kaan and Olinick (2013)</a>		✓						
<a href="#">Lee and Savelsbergh (2015)</a>	✓							
<a href="#">Li and Chung (2020)</a>				✓				
<a href="#">Li et al. (2018)</a>		✓						
<a href="#">Lin et al. (2012)</a>		✓						

<a href="#">Liu and Liu (2020)</a>	✓							
<a href="#">Liu et al. (2019)</a>		✓						
<a href="#">Lloret-Batlle et al. (2017)</a>	✓							
<a href="#">Long et al. (2018)</a>	✓							
<a href="#">Lotfi et al. (2019)</a>				✓				
<a href="#">Lu et al. (2020)</a>				✓				
<a href="#">Ma et al. (2018a)</a>		✓						
<a href="#">Ma et al. (2018b)</a>		✓						
<a href="#">Masoud and Jayakrishnan (2017a)</a>				✓				
<a href="#">Masoud and Jayakrishnan (2017b)</a>			✓	✓				
<a href="#">Masoud et al. (2017b)</a>	✓	✓		✓				
<a href="#">Massobrio et al. (2016)</a>						✓		
<a href="#">Najmi et al. (2017)</a>	✓							
<a href="#">Naoum-Sawaya et al. (2015)</a>	✓							
<a href="#">Pelzer et al. (2015)</a>	✓							
<a href="#">Qian et al. (2017)</a>	✓							
<a href="#">Ren et al. (2020)</a>		✓						
<a href="#">Santos and Xavier (2013)</a>				✓				
<a href="#">Santos and Xavier (2015)</a>				✓				
<a href="#">Simonetto et al. (2019)</a>	✓	✓						
<a href="#">Stiglic et al. (2015)</a>		✓						
<a href="#">Stiglic et al. (2016)</a>	✓							
<a href="#">Smet (2019)</a>							✓	
<a href="#">Su et al. (2019)</a>					✓			
<a href="#">Sun and Zhang (2018)</a>		✓						
<a href="#">Tafreshian and Masoud (2020a)</a>	✓	✓						
<a href="#">Tafreshian and Masoud (2020b)</a>	✓							
<a href="#">Tamannaie &amp; Irandoost (2019)</a>		✓						
<a href="#">Wang et al. (2018)</a>	✓							
<a href="#">Wang et al. (2016)</a>		✓						

<a href="#">Wu et al. (2016)</a>	✓							
<a href="#">Xia et al. (2015)</a>		✓						
<a href="#">Yan et al. (2012)</a>							✓	
<a href="#">Yan et al. (2011)</a>							✓	
<a href="#">Yan et al. (2014)</a>							✓	
<a href="#">Yan and Chen (2011b)</a>							✓	
<a href="#">Yan and Chen (2011a)</a>							✓	
<a href="#">Ye et al. (2015)</a>		✓						
<a href="#">Yu et al. (2019)</a>		✓						
<a href="#">Zhang and Zhang (2020)</a>	✓							
<a href="#">Zhang et al. (2019)</a>		✓						
<a href="#">Zhang et al. (2020)</a>		✓						
<a href="#">Zhao et al. (2018)</a>		✓						

**Table S3.** Summary of Papers based on the Characteristics of SMP

[illegible]



<a href="#">Bit-Monnot et al. (2013)</a>																	✓
<a href="#">Bruck et al. (2017)</a>															✓		
<a href="#">Cangialosi et al. (2016)</a>		✓							✓								✓
<a href="#">Cao et al. (2021)</a>						✓											✓
<a href="#">Cheikh-Graiet et al. (2020)</a>		✓	✓		✓	✓	✓										✓
<a href="#">Cheikh &amp; Hammadi (2016)</a>	✓	✓	✓		✓												✓
<a href="#">Chen et al. (2019a)</a>		✓	✓	✓	✓		✓	✓									✓
<a href="#">Chen et al. (2019b)</a>					✓	✓									✓		
<a href="#">Chen et al. (2019c)</a>	✓	✓		✓													✓
<a href="#">Chou et al. (2016)</a>		✓													✓		
<a href="#">Di Febbraro et al. (2013)</a>									✓								✓
<a href="#">Du et al. (2016)</a>		✓														✓	
<a href="#">Duan et al. (2018)</a>																	✓
<a href="#">Enzi et al. (2020)</a>																	✓
<a href="#">Guan et al. (2020)</a>		✓				✓											✓
<a href="#">Guo et al. (2013b)</a>		✓			✓										✓		
<a href="#">Herbawi and Weber (2011c)</a>		✓	✓														✓
<a href="#">Herbawi and Weber (2011b)</a>		✓	✓														✓
<a href="#">Herbawi and Weber (2011a)</a>		✓	✓														✓
<a href="#">Herbawi and Weber (2012d)</a>		✓				✓						✓					✓



[illegible]



<a href="#">Xia et al. (2015)</a>																✓		
<a href="#">Yan et al. (2011)</a>						✓										✓		
<a href="#">Yan et al. (2012)</a>						✓										✓		
<a href="#">Yan et al. (2014)</a>						✓		✓								✓		
<a href="#">Yan and Chen (2011b)</a>						✓										✓		
<a href="#">Yan and Chen (2011a)</a>						✓										✓		
<a href="#">Ye et al. (2015)</a>		✓														✓		
<a href="#">Yu et al. (2019)</a>		✓														✓		
<a href="#">Yu et al. (2020)</a>	✓	✓			✓											✓		
<a href="#">Zhang and Zhang (2020)</a>		✓														✓		
<a href="#">Zhang et al. (2019)</a>	✓					✓												✓
<a href="#">Zhang et al. (2020)</a>		✓														✓		
<a href="#">Zhao et al. (2018)</a>		✓				✓	✓						✓			✓		

**Table S4.** Summary of Papers based on the Optimisation Objectives of SMP

Paper	Objectives	
	Minimise	Maximise





<a href="#">Herbawi and Weber (2011b)</a>	✓	✓	✓															
<a href="#">Herbawi and Weber (2011a)</a>	✓	✓	✓															
<a href="#">Herbawi and Weber (2012d)</a>	✓			✓									✓					
<a href="#">Herbawi and Weber (2012b)</a>	✓	✓	✓															
<a href="#">Herbawi and Weber (2012a)</a>	✓			✓									✓					
<a href="#">Herbawi and Weber (2012c)</a>	✓			✓									✓					
<a href="#">Hosni et al. (2014)</a>														✓				
<a href="#">Hou et al. (2018)</a>																✓		
<a href="#">Hsieh and Zhan (2018)</a>			✓															
<a href="#">Hsieh et al. (2019)</a>			✓															
<a href="#">Huang et al. (2014a)</a>			✓	✓	✓								✓		✓			
<a href="#">Huang et al. (2014b)</a>			✓							✓								
<a href="#">Huang et al. (2016)</a>			✓															
<a href="#">Huang et al. (2017)</a>			✓	✓									✓			✓		



<a href="#">Huang et al. (2018a)</a>				✓										✓			✓		
<a href="#">Huang et al. (2018b)</a>			✓																
<a href="#">Jung et al. (2016)</a>			✓												✓				
<a href="#">Kaan and Olinick (2013)</a>			✓																
<a href="#">Lee and Savelsbergh (2015)</a>			.											✓					
<a href="#">Li and Chung (2020)</a>			✓																
<a href="#">Li et al. (2018)</a>			✓																
<a href="#">Lin et al. (2012)</a>	✓		✓																
<a href="#">Liu and Liu (2020)</a>				✓										✓					
<a href="#">Liu et al. (2019)</a>				✓															
<a href="#">Lloret-Batlle et al. (2017)</a>			✓																
<a href="#">Long et al. (2018)</a>	✓		✓						✓					✓					
<a href="#">Lotfi et al. (2019)</a>															✓				
<a href="#">Lu et al. (2020)</a>			✓																
<a href="#">Ma (2017)</a>	✓																		
<a href="#">Ma et al. (2018a)</a>			✓																
<a href="#">Ma et al. (2018b)</a>	✓			✓															
<a href="#">Masoud and Jayakrishnan (2017a)</a>														✓					

<a href="#">Masoud and Jayakrishnan (2017b)</a>			✓															
<a href="#">Masoud et al. (2017a)</a>			✓															
<a href="#">Masoud et al. (2017b)</a>													✓					
<a href="#">Massobrio et al. (2016)</a>			✓			✓												
<a href="#">Najmi et al. (2017)</a>				✓									✓					
<a href="#">Nam et al. (2018)</a>	✓		✓		✓			✓					✓					
<a href="#">Naoum-Sawaya et al. (2015)</a>	✓																	
<a href="#">Pelzer et al. (2015)</a>								✓					✓					
<a href="#">Qian et al. (2017)</a>				✓														
<a href="#">Regue et al. (2016)</a>		✓	✓										✓					
<a href="#">Ren et al. (2020)</a>			✓															
<a href="#">Santos and Xavier (2013)</a>			✓										✓					
<a href="#">Santos and Xavier (2015)</a>			✓										✓					
<a href="#">Simonetto et al. (2019)</a>			✓															
<a href="#">Stiglic et al. (2015)</a>				✓									✓					
<a href="#">Stiglic et al. (2016)</a>				✓									✓					
<a href="#">Stiglic et al. (2018)</a>				✓									✓					
<a href="#">Smet (2019)</a>			✓										✓					

[illegible]

<a href="#">Zhang and Zhang (2020)</a>			✓															✓	
<a href="#">Zhang et al. (2019)</a>				✓															
<a href="#">Zhang et al. (2020)</a>				✓									✓						
<a href="#">Zhao et al. (2018)</a>			✓						✓										

**Table S5:** List of Algorithms employed in selected Papers for SMP

Paper	Algorithms / Approaches
<a href="#">Agatz et al. (2011)</a>	Greedy matching algorithm
<a href="#">Aissat and Oulamara (2014a)</a>	Bidirectional search algorithm + shortest path one-to-all (heuristic)
<a href="#">Aissat and Oulamara (2014b)</a>	Enumerative method (exact) + heuristic with closest nodes metric + heuristic with global path's total cost metric
<a href="#">Aissat and Oulamara (2015a)</a>	Bidirectional search algorithm + shortest path one-to-all (heuristic)
<a href="#">Aissat and Oulamara (2015b)</a>	Bidirectional search algorithm + shortest path one-to-all (heuristic)
<a href="#">Aissat and Oulamara (2015c)</a>	Improved Dijkstra algorithm with the concept of adding offer and demand
<a href="#">Alonso-Mora et al. (2017)</a>	Greedy assignment + constrained optimization
<a href="#">Armant and Brown (2014)</a>	CPLEX
<a href="#">Armant and Brown (2020)</a>	CPLEX
<a href="#">Auaad and Van Hentenryck (2021)</a>	Route enumeration algorithm + fleet sizing algorithm
<a href="#">Aydin et al. (2020)</a>	Heuristic + Needleman-Wunsch algorithm
<a href="#">Ben Cheikh et al. (2017)</a>	Metaheuristic Approach Based on Controlled Genetic Operators (MACGeO)
<a href="#">Bian and Liu (2017)</a>	Simulated annealing with four neighbourhood structure

<a href="#">Bian and Liu (2019a)</a>	Solution Pooling Approach (SPA)
<a href="#">Bian and Liu (2019b)</a>	Solution Pooling Approach (SPA)
<a href="#">Bit-Monnot et al. (2013)</a>	Exact and heuristic dominance rule
<a href="#">Bruck et al. (2017)</a>	Greedy constructive heuristic + refined based local search (two-stage algorithm)
<a href="#">Cangialosi et al. (2016)</a>	MILP solver
<a href="#">Cao et al. (2021)</a>	Genetic algorithm
<a href="#">Cheikh &amp; Hammadi (2016)</a>	Autonomous and Intelligent Agents
<a href="#">Cheikh-Graiet et al. (2020)</a>	Multi-criterion tabu search algorithm
<a href="#">Chen et al. (2019a)</a>	Greedy heuristic
<a href="#">Chen et al. (2019b)</a>	Rollover approach + local search
<a href="#">Chen et al. (2019c)</a>	Cluster-based solution method
<a href="#">Chou et al. (2016)</a>	Stochastic set based particle swarm optimization
<a href="#">Di Febbraro et al. (2013)</a>	Discrete event systems based simulation
<a href="#">Du et al. (2016)</a>	LINGO
<a href="#">Duan et al. (2018)</a>	Partition merging based on greedy algorithms
<a href="#">Enzi et al. (2020)</a>	Column generation based algorithm
<a href="#">Guan et al. (2020)</a>	Hybrid VNS-NSGA-II algorithm
<a href="#">Guo et al. (2013)</a>	Hybrid ant colony algorithm
<a href="#">Herbawi and Weber (2011a)</a>	Non-Dominated Sorting Genetic Algorithm II (NSGA-II) + multi-objective ant colony optimization
<a href="#">Herbawi and Weber (2011b)</a>	Non-Dominated Sorting Genetic Algorithm II (NSGA-II) + Improved Strength Pareto Evolutionary Algorithm (SPEA2) + Region-based Selection in Evolutionary Multiobjective Optimization (PESA-II) + Indicator-Based Selection in Multiobjective Search (IBEA)
<a href="#">Herbawi and Weber (2011c)</a>	Non-Dominated Sorting Genetic Algorithm II (NSGA-II)
<a href="#">Herbawi and Weber (2012a)</a>	Genetic and insertion heuristic algorithm
<a href="#">Herbawi and Weber (2012b)</a>	Genetic local search algorithm

<a href="#">Herbawi and Weber (2012c)</a>	Genetic algorithm
<a href="#">Herbawi and Weber (2012d)</a>	Genetic algorithm
<a href="#">Hosni et al. (2014)</a>	Simple heuristic, incremental cost heuristic (ICH) with Lagrangian decomposition approach
<a href="#">Hou et al. (2018)</a>	Large neighbourhood search algorithm
<a href="#">Hsieh and Zhan (2018)</a>	Differential evolution
<a href="#">Hsieh et al. (2019)</a>	Discrete cooperative coevolving particle swarm optimization (DCCPSO) algorithm
<a href="#">Huang et al. (2014a)</a>	Genetic algorithm
<a href="#">Huang et al. (2014b)</a>	Fuzzy controlled genetic algorithm
<a href="#">Huang et al. (2016)</a>	Tabu search
<a href="#">Huang et al. (2017)</a>	Heuristic Multi-Objective Optimization Algorithm (HMOCSPI) based on Non-Dominated Sorting Genetic Algorithm
<a href="#">Huang et al. (2018a)</a>	Ant Path-oriented Carpooling Allocation (APCA) approach
<a href="#">Huang et al. (2018b)</a>	Dijkstra Algorithm and A* Algorithm + concept of Drive-Time Areas (DTAs)
<a href="#">Jung et al. (2016)</a>	Hybrid simulated annealing
<a href="#">Kaan and Olinick (2013)</a>	Restricted allowance heuristic + relaxed restricted allowance heuristic + greedy cover heuristic
<a href="#">Lee and Savelsbergh (2015)</a>	Path construction + neighbourhood search
<a href="#">Li and Chung (2020)</a>	Hybrid heuristic algorithm based on an insertion algorithm and tabu search + clustering algorithm (greedy heuristic and k-means algorithm)
<a href="#">Li et al. (2018)</a>	Tabu based metaheuristic algorithm
<a href="#">Lin et al. (2012)</a>	Simulated annealing algorithm
<a href="#">Liu and Liu (2020)</a>	Dynamic grid-based heuristic algorithm
<a href="#">Liu et al. (2019)</a>	Exact algorithm and approximate algorithm
<a href="#">Lloret-Batlle et al. (2017)</a>	VCG Mechanism + min-cost flow + network simplex
<a href="#">Long et al. (2018)</a>	Monte carlo simulation
<a href="#">Lotfi et al. (2019)</a>	Decomposition based modified column generation algorithm
<a href="#">Lu et al. (2020)</a>	Lagrangian relaxation solution approach + two stage heuristic method

<a href="#">Ma (2017)</a>	Shareability concept
<a href="#">Ma et al. (2018a)</a>	Recursive algorithm + delete operator
<a href="#">Ma et al. (2018b)</a>	improved genetic algorithm + banker principle + crowding density
<a href="#">Masoud and Jayakrishnan (2017a)</a>	Decomposition algorithm
<a href="#">Masoud and Jayakrishnan (2017b)</a>	Dynamic programming
<a href="#">Masoud et al. (2017a)</a>	Dynamic programming
<a href="#">Masoud et al. (2017b)</a>	Dynamic programming
<a href="#">Massobrio et al. (2016)</a>	Non-Dominated Sorting Genetic Algorithm II (NSGA-II)
<a href="#">Najmi et al. (2017)</a>	Clustering heuristic approach
<a href="#">Nam et al. (2018)</a>	Dynamic programming
<a href="#">Naoum-Sawaya et al. (2015)</a>	Savings heuristic
<a href="#">Pelzer et al. (2015)</a>	Partition based algorithm
<a href="#">Qian et al. (2017)</a>	Exact and heuristic for induced group ride graph
<a href="#">Regue et al. (2016)</a>	Aggregation–disaggregation algorithm + decomposition approach
<a href="#">Ren et al. (2020)</a>	Genetic algorithm
<a href="#">Santos and Xavier (2013)</a>	Greedy Randomized Adaptive Search Procedure (GRASP)
<a href="#">Santos and Xavier (2015)</a>	Greedy Randomized Adaptive Search Procedure (GRASP)
<a href="#">Simonetto et al. (2019)</a>	Insertion heuristic + large neighbourhood search algorithm
<a href="#">Smet (2019)</a>	Late acceptance hill climbing
<a href="#">Stiglic et al. (2015)</a>	Basic algorithm + refined algorithm / hierarchical optimization approach
<a href="#">Stiglic et al. (2016)</a>	Matching, schedule, detour flexibility + lexicographic optimization
<a href="#">Stiglic et al. (2018)</a>	Ride-matching algorithm (match identification phase + optimization phase)
<a href="#">Su et al. (2019)</a>	Artificial bee colony algorithm combining variable neighbour search and tabu list
<a href="#">Sun and Zhang (2018)</a>	Insertion heuristic

<a href="#">Tafreshian and Masoud (2020a)</a>	Graph partitioning algorithm based on the bipartite graph
<a href="#">Tafreshian and Masoud (2020b)</a>	Decomposition algorithm based on Lagrangian relaxation
<a href="#">Tamannaei &amp; Irandoost (2019)</a>	Branch & bound + heuristic beam search algorithm
<a href="#">Wang et al. (2018)</a>	Greedy matching method
<a href="#">Wang et al. (2016)</a>	Tabu search + greedy insertion + adjust pickup time algorithm
<a href="#">Wu et al. (2016)</a>	Local search (hill climbing, simulated annealing, swap and move neighbourhood, random neighbourhood) + exhaustive search (dynamic programming)
<a href="#">Xia et al. (2015)</a>	Simulated annealing + tabu search
<a href="#">Yan and Chen (2011a)</a>	Solution algorithm based on Lagrangian relaxation, a subgradient method, and a heuristic for the upper bound solution
<a href="#">Yan and Chen (2011b)</a>	Solution algorithm based on Lagrangian relaxation, a subgradient method, and a heuristic for the upper bound solution
<a href="#">Yan et al. (2011)</a>	Solution algorithm based on Lagrangian relaxation, a subgradient method, and a heuristic for the upper bound solution
<a href="#">Yan et al. (2012)</a>	Solution algorithm based on Lagrangian relaxation, a subgradient method, and a heuristic for the upper bound solution
<a href="#">Yan et al. (2014)</a>	Solution algorithm based on Lagrangian relaxation, a subgradient method, and a heuristic for the upper bound solution
<a href="#">Ye et al. (2015)</a>	Non-Dominated Sorting Genetic Algorithm (NSGA)
<a href="#">Yu et al. (2019)</a>	Decomposition method + exact algorithm
<a href="#">Yu et al. (2020)</a>	Angle based clustering algorithm
<a href="#">Zhang and Zhang (2020)</a>	Set-based differential evolution algorithm
<a href="#">Zhang et al. (2019)</a>	Parallel scheme with simulated annealing
<a href="#">Zhang et al. (2020)</a>	Improved genetic algorithm with station coding and decoding design.
<a href="#">Zhao et al. (2018)</a>	Customized solution approach based on Lagrangian relaxation



**Table S6:** Summary of Papers based on the Solution Approaches of SMP

Paper	Exact	Heuristic / Metaheuristic	Others Approaches
<a href="#">Agatz et al. (2011)</a>	✓		
<a href="#">Aissat and Oulamara (2014a)</a>	✓	✓	
<a href="#">Aissat and Oulamara (2014b)</a>	✓	✓	
<a href="#">Aissat and Oulamara (2015a)</a>	✓	✓	
<a href="#">Aissat and Oulamara (2015b)</a>	✓	✓	
<a href="#">Aissat and Oulamara (2015c)</a>	✓		
<a href="#">Alonso-Mora et al. (2017)</a>	✓	✓	
<a href="#">Armant and Brown (2014)</a>	✓		
<a href="#">Armant and Brown (2020)</a>	✓		
<a href="#">Auad and Van Hentenryck (2021)</a>			✓
<a href="#">Aydin et al. (2020)</a>		✓	
<a href="#">Ben Cheikh et al. (2017)</a>		✓	
<a href="#">Bian and Liu (2017)</a>		✓	
<a href="#">Bian and Liu (2019a)</a>		✓	
<a href="#">Bian and Liu (2019b)</a>		✓	
<a href="#">Bit-Monnot et al. (2013)</a>	✓	✓	
<a href="#">Bruck et al. (2017)</a>	✓	✓	
<a href="#">Cangialosi et al. (2016)</a>	✓		
<a href="#">Cao et al. (2021)</a>		✓	
<a href="#">Cheikh &amp; Hammadi (2016)</a>		✓	
<a href="#">Cheikh-Graiet et al. (2020)</a>		✓	
<a href="#">Chen et al. (2019a)</a>		✓	
<a href="#">Chen et al. (2019b)</a>		✓	
<a href="#">Chen et al. (2019c)</a>		✓	
<a href="#">Chou et al. (2016)</a>		✓	
<a href="#">Di Febbraro et al. (2013)</a>			✓
<a href="#">Du et al. (2016)</a>	✓		
<a href="#">Duan et al. (2018)</a>		✓	
<a href="#">Enzi et al. (2020)</a>	✓		
<a href="#">Guan et al. (2020)</a>		✓	
<a href="#">Guo et al. (2013)</a>		✓	

<a href="#">Herbawi and Weber (2011a)</a>		✓	
<a href="#">Herbawi and Weber (2011b)</a>		✓	
<a href="#">Herbawi and Weber (2011c)</a>		✓	
<a href="#">Herbawi and Weber (2012a)</a>		✓	
<a href="#">Herbawi and Weber (2012b)</a>		✓	
<a href="#">Herbawi and Weber (2012c)</a>		✓	
<a href="#">Herbawi and Weber (2012d)</a>		✓	
<a href="#">Hosni et al. (2014)</a>	✓	✓	
<a href="#">Hou et al. (2018)</a>		✓	
<a href="#">Hsieh and Zhan (2018)</a>		✓	
<a href="#">Hsieh et al. (2019)</a>		✓	
<a href="#">Huang et al. (2014a)</a>		✓	
<a href="#">Huang et al. (2014b)</a>		✓	
<a href="#">Huang et al. (2016)</a>		✓	
<a href="#">Huang et al. (2017)</a>		✓	
<a href="#">Huang et al. (2018a)</a>		✓	
<a href="#">Huang et al. (2018b)</a>	✓		
<a href="#">Jung et al. (2016)</a>		✓	
<a href="#">Kaan and Olinick (2013)</a>		✓	
<a href="#">Lee and Savelsbergh (2015)</a>		✓	
<a href="#">Li and Chung (2020)</a>	✓	✓	
<a href="#">Li et al. (2018)</a>		✓	
<a href="#">Lin et al. (2012)</a>		✓	
<a href="#">Liu and Liu (2020)</a>		✓	
<a href="#">Liu et al. (2019)</a>	✓	✓	
<a href="#">Lloret-Batlle et al. (2017)</a>			✓
<a href="#">Long et al. (2018)</a>			✓
<a href="#">Lotfi et al. (2019)</a>	✓		
<a href="#">Lu et al. (2020)</a>		✓	
<a href="#">Ma (2017)</a>			✓
<a href="#">Ma et al. (2018a)</a>		✓	
<a href="#">Ma et al. (2018b)</a>		✓	
<a href="#">Masoud and Jayakrishnan (2017a)</a>	✓		

<a href="#">Masoud and Jayakrishnan (2017b)</a>	✓		
<a href="#">Masoud et al. (2017a)</a>	✓		
<a href="#">Masoud et al. (2017b)</a>	✓		
<a href="#">Massobrio et al. (2016)</a>		✓	
<a href="#">Najmi et al. (2017)</a>		✓	
<a href="#">Nam et al. (2018)</a>	✓		
<a href="#">Naoum-Sawaya et al. (2015)</a>		✓	
<a href="#">Pelzer et al. (2015)</a>	✓		
<a href="#">Qian et al. (2017)</a>	✓	✓	
<a href="#">Regue et al. (2016)</a>	✓		
<a href="#">Ren et al. (2020)</a>		✓	
<a href="#">Santos and Xavier (2013)</a>		✓	
<a href="#">Santos and Xavier (2015)</a>		✓	
<a href="#">Simonetto et al. (2019)</a>		✓	
<a href="#">Smet (2019)</a>		✓	
<a href="#">Stiglic et al. (2015)</a>	✓		
<a href="#">Stiglic et al. (2016)</a>	✓		
<a href="#">Stiglic et al. (2018)</a>	✓		
<a href="#">Su et al. (2019)</a>		✓	
<a href="#">Sun and Zhang (2018)</a>		✓	
<a href="#">Tafreshian and Masoud (2020a)</a>		✓	
<a href="#">Tafreshian and Masoud (2020b)</a>	✓		
<a href="#">Tamannaei &amp; Irandoost (2019)</a>	✓	✓	
<a href="#">Wang et al. (2018)</a>	✓		
<a href="#">Wang et al. (2016)</a>		✓	
<a href="#">Wu et al. (2016)</a>		✓	
<a href="#">Xia et al. (2015)</a>		✓	
<a href="#">Yan and Chen (2011a)</a>		✓	
<a href="#">Yan and Chen (2011b)</a>		✓	
<a href="#">Yan et al. (2011)</a>		✓	
<a href="#">Yan et al. (2012)</a>		✓	
<a href="#">Yan et al. (2014)</a>		✓	
<a href="#">Ye et al. (2015)</a>		✓	

<a href="#">Yu et al. (2019)</a>	✓		
<a href="#">Yu et al. (2020)</a>		✓	
<a href="#">Zhang and Zhang (2020)</a>		✓	
<a href="#">Zhang et al. (2019)</a>		✓	
<a href="#">Zhang et al. (2020)</a>		✓	
<a href="#">Zhao et al. (2018)</a>		✓	

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