

URBAN TOURISM: STATE, EVOLUTION, FRAMEWORK, AND FUTURE CHARACTERISTICS BASED ON CITESPACE BIBLIOMETRIC ANALYSIS

GENG, Y. Q.¹ – BAI, W. Q.^{1*} – LIU, C. Y.¹ – LI, J. Y.² – GAO, J.¹

¹*School of Business, Shanghai Dianji University, 300 Shuihua Rd., Shanghai 201306, China*

²*Nursing Department, Guizhou Nursing Vocational College, Dazhi Road, Guiyang, Guizhou 550000, China*

**Corresponding author
e-mail: baiwenqian0624@163.com*

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Abstract. Urban tourism has always been a popular topic and needs comprehensive and dynamic analysis. This study uses CiteSpace for bibliometric analysis to show its current state, evolution, and future trends; we construct a theoretical framework and depict future research characteristics based on the results. This multidisciplinary field covers various topics such as environment, transportation, hospitality, urban planning, technology, and tourist behaviors; factors (such as urban demands, epidemics, and behavioral intention) influencing urban tourism are explored; research methodologies (such as case and empirical study) are also emphasized. Future research will have more publications, focus on travel issues, coordinate interactions between urban tourism and other factors, and be people-oriented with more complicated approaches and comprehensive perspectives. This study is innovative because we comprehensively and dynamically summarize this field with visualization, construct a theoretical framework, and pinpoint the future characteristics, helping us to understand this field and to continue research efficiently.

Keywords: *scientometrics, research progress, tourism science, Web of Science, review*

Introduction

COVID-19 has had an impact on the tourism industry (Geng et al., 2024a). The fade of COVID-19 and the stimulation of encouraging tourism policies make urban tourism a hot topic again. Traditional urban tourism relies on urban historical landscapes and non-renewable resources, destroying the sustainability of urban ecological and living environment (Zhang et al., 2022). Therefore, new modes of urban tourism are gradually discussed; current urban tourism emphasizes protecting the urban environment, reducing energy emissions, preserving urban landscapes and cultural heritages, and constructing high-quality transportation networks, which are regarded as sustainable and carbon-neutral (Lei and Zhou, 2022; Bhellar et al., 2023; Lu, 2023). According to previous studies, urban tourism is beneficial to urban communities; it can lead to local urban economic growth, promote urban infrastructure, improve living standards of residents, and enhance experience and satisfaction among local people (Neuts, 2020; Kwag et al., 2021; Herscovici et al., 2022; Díaz et al., 2023). Therefore, it is necessary to explore it thoroughly.

In this study, urban tourism refers to a unique type of tourism where urban areas attract travellers with accommodation, transportation, and sights in the urban communities based on modern urban facilities, human landscapes and sceneries, and considerate services. Urban tourism has been considered a vital tourism practice globally and has attracted scholars to initiate exploring the theories and applications of this field. Urban tourism

contributes to the social and economic growth of urban communities; for instance, from the perspective of cities, it enhances cities' brand images and promotes their sustainability (Zhao et al., 2022); also, it improves urban infrastructure such as road networks, internet, and public services (Wang et al., 2020; Mo and Ren, 2021). From the perspective of cultural protection, urban tourism-related policies or regulations usually promote protecting historical cultural landscapes and using urban cultural resources wisely (García-Hernández et al., 2017). Regarding the growth of the tourism industry, urban tourism activities increase job opportunities and promote local long-term tourism growth with sustainability (Yiu and Cheung, 2021). From the tourism-related enterprise perspective, urban tourism provides a profitable niche-segmented market, which means that enterprises can explore new market opportunities and set up new strategies and tactics to enhance competitiveness and profit (Dai et al., 2019). From the tourist perspective, tourists have more diversified tourism choices to relax and entertain themselves, urban tourism enriches their destination experiences (Bichler and Pikkemaat, 2021). From the residents' perspective, tourist movement contributes to communication between tourists and residents and achieves cultural exchange (Liu, 2020; Niu and Chen, 2022). We can find that urban tourism benefits different stakeholders, making it increasingly critical.

Some urban tourism research is increasing, covering different topics. Specifically, some studies discuss problems in urban tourism, such as unbalanced tourism resource distribution, environmental pollution, epidemics spread, and difficult urban growth and transformation (Freytag and Bauder, 2018; Weiss et al., 2018; Cohen and Hopkins, 2019); some discuss factors affecting urban tourism, such as urban construction and forms, traffic conditions, and economic development (Mou et al., 2020; Widianingsih et al., 2023); explore tourist's behaviors, such as travel intentions, experiences, perceptions, accessibilities and assistance (Ma et al., 2022; Su and Chen, 2022; Tan et al., 2022; Wu et al., 2022); some explore the interactions between urban tourism and other systems, such as environmental governance, cultural heritage preservation, habitat environment, education, and finance (Liao et al., 2018; Geng et al., 2020, 2022; Zhang et al., 2023); some discuss its importance for promoting sustainable urban community and carbon neutrality (García-Hernández et al., 2017; Lin and Wang, 2021); some propose possible results and countermeasures for developing urban tourism, such as urban gentrification, improving transportation networks and technologies, improving urban construction, promoting tourism management regulations, and improving tourism service quality (Zhang et al., 2017b; Jenelius and Koutsopoulos, 2018; Wang et al., 2022; Liu, 2023); some focus on methodologies of urban tourism research, such as case studies, machine learning, simulation, structural equation modeling, qualitative comparative analysis, and system dynamics (Koens et al., 2018; Liao et al., 2018; Yang et al., 2021; Zhang and Long, 2022; Gazoni and da Silva, 2022). The above various topics contribute to urban tourism theoretically and practically.

Furthermore, urban tourism needs to be explored in a more detailed and comprehensive manner. For example, we need to explore the knowledge evolution, hotspots, and emerging trends of this research field better to understand the dynamics and status of urban tourism comprehensively; we need to summarize the research results and establish theoretical frameworks for the field to help us to understand the scope of theoretical research thoroughly and to have new insights for the future research and practice. Previous studies have summarized urban tourism research from various perspectives, such as population mobility, urban development, and tourism industry growth, which provide insights for us (Zhao and Jiao, 2019; López-Gay et al., 2021;

Zhang and Jiang, 2021; Zhang and Long, 2022); however, previous studies still need to be improved. For example, they need comprehensive, long-term, and dynamic analysis and interpret research progress with visualized clusters, which systematically, intuitively, and visually expands our understanding of this field's evolution and potential trends. Therefore, it is necessary to use more accessible, visualized, and systematic approaches to interpret the research progress of this field so that it is possible to expand scholars' ideas of this field and further stimulate the theoretical and practical growth of urban tourism.

This paper uses a bibliometric approach to summarize urban tourism research's current state, evolution, and hotspots from multiple aspects, aiming to comprehensively and dynamically understand what scholars have done in this field. Specifically, we use CiteSpace software to analyse urban tourism research from 2000 to 2023, summarize the research performances, collaboration interactions, current status, evolution, and trends, construct a knowledge theoretical framework, and predict future research characteristics, aiming to provide references and help readers comprehensively understand this field.

The novelties of this study are as follows. (1) We comprehensively and dynamically summarize urban tourism research with visualized results, which fills previous gaps that focus on certain specific detailed topics statically and textually; (2) we construct a theoretical framework, which provides valuable references for scholars to understand the structure of this field intuitively; (3) we pinpoint the future research characteristics and hotspots, which effectively guide scholars continue research in this field efficiently.

Specifically, Section 2 discusses the data sources, selection process, analysis methods, and steps. Section 3 conducts base data analysis (publication number by year, journal, category, and author), collaboration analysis (institutional, regional, and author collaboration), co-citation analysis (journal, reference, and author co-citation), and co-occurrence analysis (category and keyword co-occurrence, and keyword bursts). Section 4 constructs a theoretical framework and proposes future research directions. Section 5 summarizes the results and presents the study's innovations and limitations.

Materials and Methods

Data Sources and Selection Processes

We chose the publications of Science Citation Index Expanded (SCIE), Social Science Citation Index (SSCI), and Arts & Humanities Citation Index (AHCI) in the Web of Science (WoS) as the data source. Scholars recognize WoS as a reliable, global database of various scholarly publications (Geng et al., 2024c). Specifically, we choose SCI, SSCI, and AHCI because they are the core indexes in WoS, and their publications have higher quality and reputation than other databases. In addition, the number of urban tourism publications in SCI, SSCI, and AHCI is considerable. Therefore, the results of this study are authoritative and representative. We collected data on August 1, 2023, using the following search criteria.

- (1) Select Web of Science Core Collection: SCIE, SSCI, and AHCI.
- (2) Title = [("tour*") OR ("travel*")] AND Title = [("urban") OR ("city") OR ("cities") OR ("metropolitan") OR ("metropolis")].
- (3) Language = "English", and publication date = from 2000-01-01 to 2023-08-01.
- (4) Document = "Article" and "Review".

We set the above criteria because of the following reasons.

- (1) SCIE, SSCI, and AHCI cover representative and comprehensive studies of urban tourism, making analysis results more convincing.
- (2) The English language makes textual comparisons possible.
- (3) The topic words are closely related to urban tourism, providing referential values for readers.

After screening out irrelevant documents, we obtain 2,162 publications (data).

Analysis Methods

This paper uses CiteSpace, a widely used software for bibliometric analysis, to conduct research. CiteSpace can analyze a research field's status and evolvement by analyzing node size, network connectivity, and clusters. There are several advantages of CiteSpace (Geng et al., 2024b,d).

- (1) It visualizes abundant results and depicts the research domain's dynamic evolution, making it intuitive to understand the field.
- (2) It clusters results and provides critical information about clusters, which helps us understand the research correlations and main topics.
- (3) It shows node details within clusters, which help us explore the targeted details of specific topics in this field.
- (4) It is easy to download and use, enjoying high popularity and authority in bibliometrics.

The software version is 6.2.R4.

We set the parameters as follows.

- (1) Create a new project named “urban tourism” (see the box 1 in *Figure 1*), specify the file address, and set the parameters (shown in *Figure 2*).
- (2) In the time slicing column, set the period from January 2000 to August 2023 and the years per slice as 1 (the box 2 in *Figure 1*).
- (3) For analysis, select different node types (Author, Institution, Country, Keyword, Category, Reference, Cited Author, Cited Journal; box 3 in *Figure 1*).
- (4) In the selection criteria column, set Top N to 50 (box 4 in *Figure 1*).
- (5) Tick “pathfinder” and “pruning sliced networks” in the pruning box (box 5 in *Figure 1*).
- (6) Click “GO!” to get the corresponding analysis results.
- (7) When making cluster figures, CiteSpace will automatically analyze the noun terms from titles, keywords, and abstracts of the publications and then obtain clusters; within each cluster, nodes enjoy similarities in the categories of titles, keywords, and abstracts. To minimize distractions from a large amount of less essential nodes and highlight the critical nodes within each cluster, we set the parameter to show only the two most representative nodes within each cluster.

Analysis Procedures

The analysis procedures are in *Figure 3*.

- (1) Base data analysis: including the number of publications by year, journal, and category. It gives a clear picture of the basics of urban tourism.
- (2) Collaboration analysis: revealing research stakeholders' relevance from institution, region, and author collaboration perspectives.
- (3) Co-citation analysis: revealing the research progress on urban tourism by analyzing journal, reference, and author co-citation.

- (4) Co-occurrence analysis: revealing potential hotspots and trends in the field by analyzing category co-occurrence, keyword co-occurrence, and keyword bursts.
- (5) Framework and future research characteristics: the knowledge theoretical framework based on previous analysis helps scholars understand the structure of urban tourism research comprehensively; future research directions can help scholars further study this field precisely.

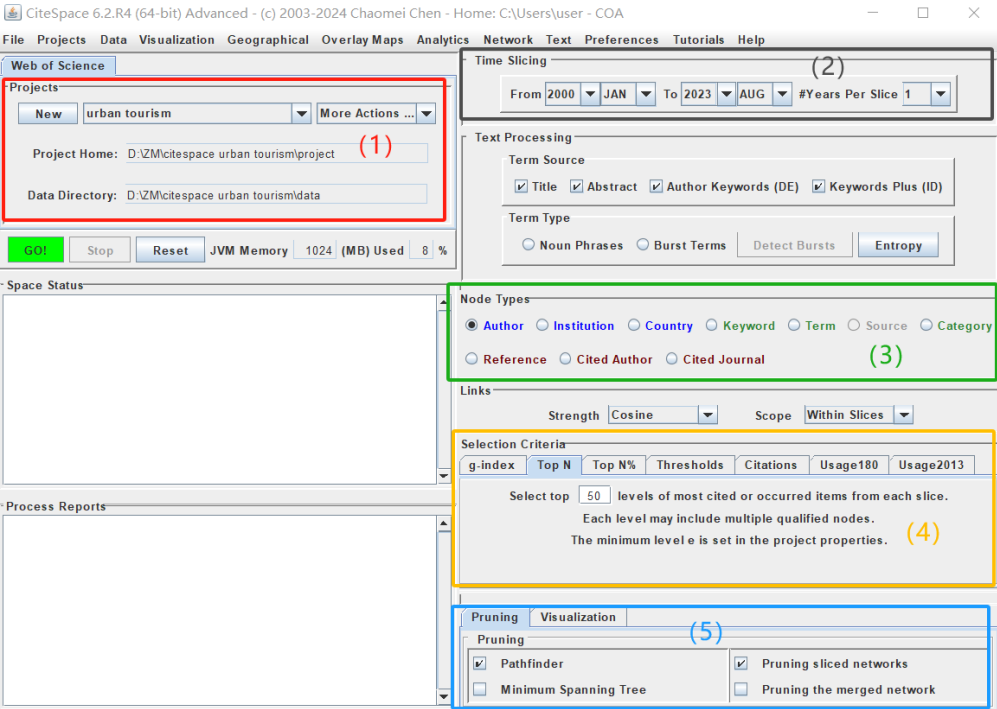


Figure 1. The Operation Interface of CiteSpace

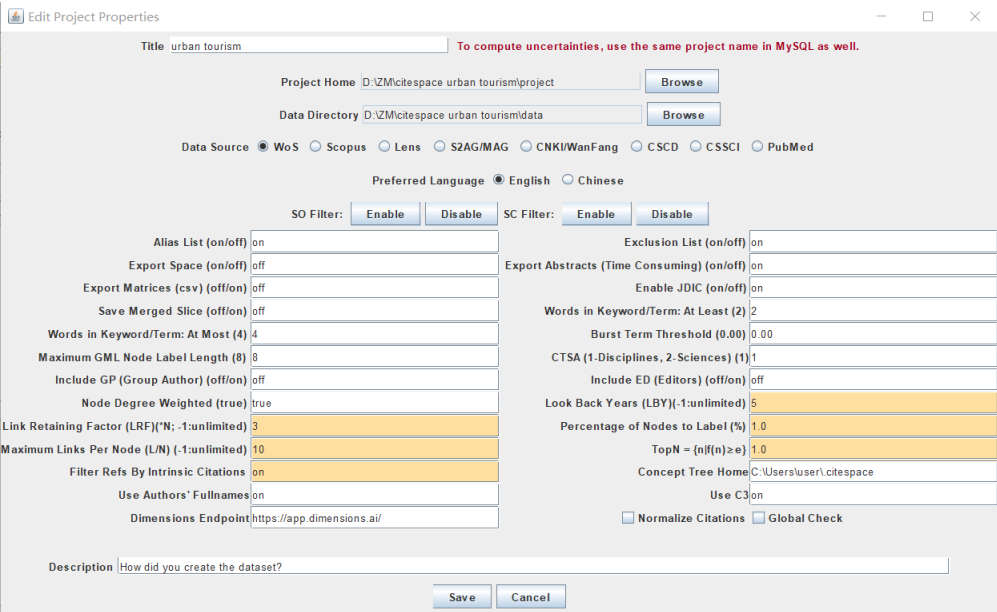


Figure 2. The Project Creation Panel with the Corresponding Parameters

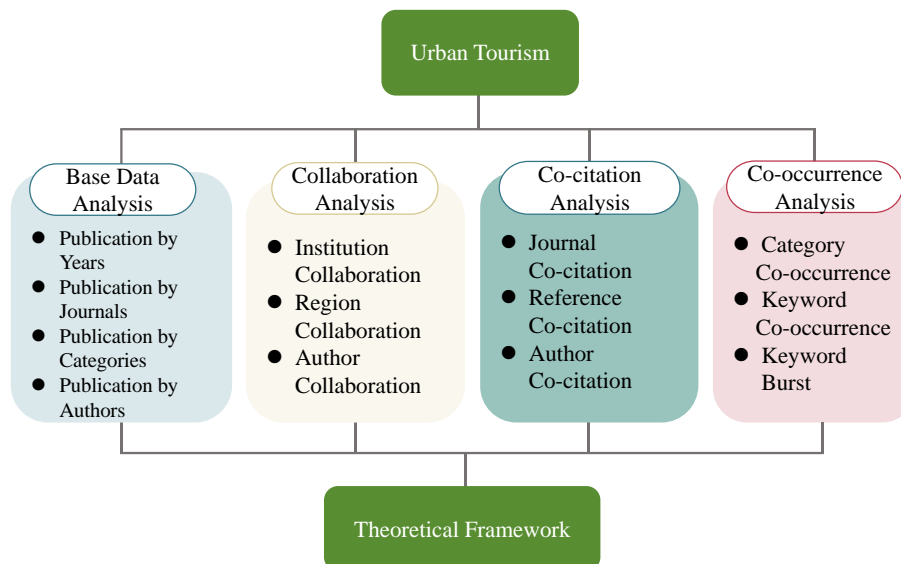


Figure 3. Research Steps

Results

Base Data Analysis

Number of Publications by Years

The annual publications (*Figure 4*) help us understand the popularity of urban tourism research. Generally, urban tourism is receiving greater attention as the number of publications increases.

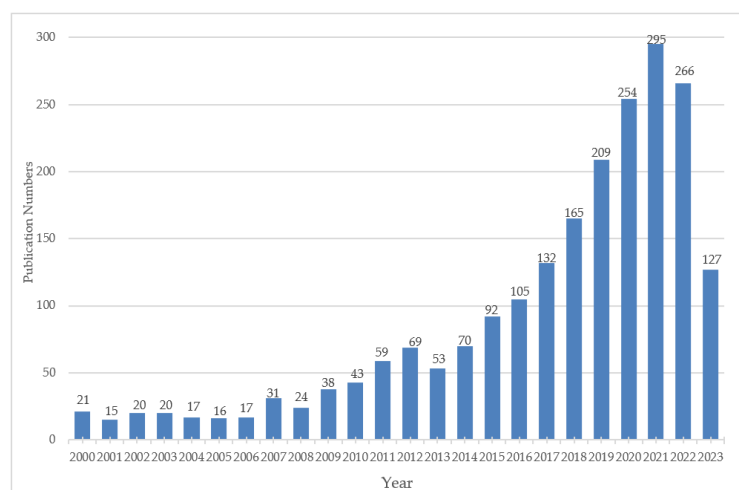


Figure 4. Publications by Years

(1) Urban tourism research can be divided into two phases. During the first stage (2000 to 2008), publications fluctuated roughly around 20 articles, indicating that urban tourism research needs to be more emphasized. During the second stage (since 2009), the number of publications increased dramatically, reaching the peak in 2021 (295 publications),

demonstrating the increasing focus among scholars. Specifically, 47.363% of the publications were published during 2019-2022, which means that urban tourism research has received unprecedented attention over the past four years.

(2) There is a slight decline in recent years. The data decline after 2021; the decline in 2022 may be related to the continuation of COVID-19, the rise of other tourism industries (such as agritourism), the intensifying urban population, and the degradation of the urban environment (Khairabadi et al., 2020; Fan and Lin, 2022; Al Shawabkeh et al., 2023; Cipriani-Avila et al., 2023). The decline in 2023 is because the data are collected in August 2023, and papers in forthcoming months are ignored. However, according to this trend, the number in 2023 may be similar to that in 2022; we assume that is because this field will be continuously affected by similar factors in 2022. Therefore, it is likely that urban tourism research will be temporarily neglected.

(3) Increasing number of journals and open access (OA) publication may contribute to the recent dramatic increase. We have to admit that the WoS has indexed increasing journals in recent years; besides, more online OA journals are publishing increasing papers. These contribute significantly to the fast increase in the number of publications of this research field. Though such fact may distract us from the current real research intensity in the field (this field may publish less and less percentage of papers compared with other research fields), we must say that more journals with increasing publications provide more opportunities for scholars to demonstrate their research progress in this field, showing the popularity of this field; at least, this field is not apparently declining in annual publications.

Number of Publications by Journals

Statistics of journal publications help us know which journals prefer publishing papers in this field. *Table 1* illustrates the top 10 journals publishing most papers in this field.

Table 1. *Publications by Journals*

Ranking	Journal	Count	Percentage	Quartile in Category
1	Sustainability	221	10.222%	Q2
2	Transportation Research Record	95	4.394%	Q3
3	Journal of Transport Geography	55	2.554%	Q1
4	Current Issues in Tourism	48	2.220%	Q1
5	Cities	45	2.081%	Q1
6	Tourism Management	44	2.035%	Q1
7	International Journal of Environmental Research and Public Health	34	1.573%	Q1
8	Transportation Research Part A Policy and Practice	31	1.434%	Q1
9	Tourism Geographies	30	1.388%	Q1
10	Transportation Research Part D Transport and Environment	29	1.341%	Q1

(1) “Sustainability” dominates publishing papers in this field. Specifically, it publishes the most papers in this field (221 articles, accounting for 10.222%), demonstrating its preference for urban tourism. This journal’s high publication volume may be because it is a mega open-access journal; it has published over 10 thousand papers annually in recent years, leading to more publications in this field.

(2) There are no other dominating journals publishing more papers. The rest of the top 9 journals publish only 19.020% of papers, demonstrating that journals in this field are relatively decentralized and diversified, and currently, no other journals have dominating roles in publishing papers in this field. Besides, these journals usually have high impacts: most of them are in Q1 in WoS, demonstrating that urban tourism research generally has high quality and impacts in the academic community.

The above results hint to scholars in this field what journals to submit in the future, and they need to endeavor to enhance research quality to make submissions smoother.

Number of Publications by Categories

Statistics on the number of categories help us to know what categories are relatively hot in this field. *Table 2* shows the top 10 categories. Here we want to highlight that the categories in *Table 2* are aligned with those in the WoS, where we obtained data, so we didn't merge some seemingly similar categories. For example, WoS regard "Environmental Studies" and "Environmental Sciences" separately, so we also keep these two categories separately and don't merge them. The same scenario applies to "Transportation" and "Transportation Science & Technology". Following the WoS classification rules helps readers understand this field more objectively.

Table 2. *Publications by Categories*

Ranking	Category	Count	Percentage
1	Environmental Studies	439	20.305%
2	Environmental Sciences	396	18.316%
3	Transportation	396	18.316%
4	Hospitality Leisure Sport Tourism	347	16.050%
5	Transportation Science & Technology	338	15.634%
6	Green Sustainable Science & Technology	293	13.552%
7	Civil Engineering	240	11.101%
8	Economics	203	9.389%
9	Urban Studies	176	8.141%
10	Geography	160	7.401%

(1) Urban tourism research covers various disciplines such as environment, transportation, science and engineering, and social sciences. Specifically, the environment discipline covers categories of environmental studies and environmental sciences, with a total of 835 articles; the transportation discipline includes categories of transportation and transportation science technology, with a total of 734 articles; the science and engineering discipline includes green sustainable science and technology, civil engineering, urban studies, and geography, totalling 869 articles; the social sciences discipline includes hospitality leisure sport tourism and economics, totalling 550 articles.

(2) The percentages are similar between the disciplines. The above four disciplines account for 38.621%, 33.95%, 40.195%, and 25.439%, respectively. They are relatively similar with minor differences, proving that urban tourism research is relatively multidisciplinary and covers various topics in different categories; research may discuss the interactions and mutual impacts between urban tourism and environmental governance, city transportation, urban planning, building construction, local economic growth, and tourist behaviors.

The above results also remind scholars that we can focus on specific aspects of urban tourism and try cross-disciplinary research.

Number of Publications by Authors

Statistics on the number of authors help us to know the most productive authors in this field. *Table 3* lists the top ten most productive authors in this field in the observed period.

Table 3. *Publications by Authors*

Ranking	Author	Region	Institution	Count
1	van Zuylen, Henk	Netherlands	Delft University of Technology	10
2	Nijkamp, Peter	Netherlands	Open University Netherlands	8
3	Tang, Jinjun	China	Central South University	8
4	Zheng, Fang	China	Southwest Jiaotong University	7
5	Susilo, Yusak O	Austria	University of Natural Resources and Life Sciences Vienna	7
6	Russo, Antonio Paolo	Spain	Universitat Rovira i Virgili	7
7	Woodcock, James	England, UK	University of Cambridge	6
8	Zhang, Jiekuan	China	Guilin Tourism University	6
9	Liu, Yu	China	Peking University	6
10	Remoaldo, Paula	Portugal	Universidade do Minho	6

The top 2 productive authors, Henk van Zuylen and Peter Nijkamp, are from the Netherlands, respectively. Henk van Zuylen's research mainly focuses on travel time in urban tourism. Specifically, this author's representative article constructs a framework to predict travel time on motorways, proposing that a state space neural network can be efficiently applied to predict travel time (van Lint et al., 2005). This author's latest publication focuses on the urban travel time reliability; the author constructs a model to assess travel time reliability under several different scenarios, and proposes that tourists' expected travel time with its reliability are correlated with tourists' tour routes choices and departure time (Zheng et al., 2018). Besides, Peter Nijkamp explores urban tourism growth patterns. For instance, this author's representative paper proposes that tourist happiness can improve tourism attractions' competitiveness, which is a beneficial reference to formulate policies to stimulate urban tourism growth (Cracolici and Nijkamp, 2009). This author's latest paper compares urban tourism and rural tourism and proposes that urban tourism overgrowth may generate the spillover effect of rural tourism growth (Kourtiti et al., 2024).

(2) Among the most productive authors, four are from China, which demonstrates the relative proactivity of Chinese authors in this field. Among the most productive authors, Jiekuan Zhang from Guilin Tourism University should be noticed. Guilin Tourism University is generally relatively less recognized and competitive than other productive authors' institutions. In contrast, this author outperforms in this field, proving this author and this affiliation's hardworking spirit in this field. This author's latest paper explores the correlation between innovative city construction and tourism competitiveness, finding that innovative city construction positively affects tourist destination competitiveness and that the effect increases over time; however, innovative city construction may negatively affect tourism industrial competitiveness (Zhang, 2024). The findings provide insights for policymakers to make corresponding countermeasures.

In conclusion, the top 10 most productive authors have six or more publications, and they come from different countries. We encourage researchers from the globe to explore the field even more challenging to contribute to the progress of urban tourism research.

Collaboration Analysis

Collaboration analysis aims to identify the research relevance between different institutions, regions, and authors, helping scholars identify potential collaborators in the future.

Institution Collaboration

Table 4 lists the top 10 collaborating institutions. The top 10 institutions are located in Asia (6 institutions), Europe (3), and North America (1), suggesting that urban tourism is a highly collaborative topic across regions.

Table 4. *Institution Collaboration*

Ranking	Institution	Region	Count	Centrality
1	Chinese Academy of Sciences	China	46	0.17
2	Hong Kong Polytechnic University	China	37	0.07
3	University of California System	USA	36	0.12
4	Southeast University - China	China	33	0.08
5	University of London	UK	31	0.08
6	Tongji University	China	28	0.14
7	N8 Research Partnership	UK	27	0.06
8	Beijing Jiaotong University	China	26	0.04
9	Institute of Geographic Sciences & Natural Resources Research	China	25	0.03
10	Delft University of Technology	Netherlands	24	0.07

(1) The most active Asian institutions are all Chinese institutions, including the Chinese Academy of Sciences (46 collaboration publications), Hong Kong Polytechnic University (37), and Southeast University-China (33). Besides, the Chinese Academy of Sciences has the highest centrality (0.17), demonstrating its significant influence on collaboration. One of the collaboration topics of this institution is the interaction between urban tourism and nearby rural development, believing that urban tourism contributes to nearby villages' economic growth, accelerates rural-urban integrated growth, and promotes sustainability (Yang et al., 2010). This collaboration also proves the importance of developing urban tourism.

(2) Institutions in the UK and the Netherlands are more collaborative in Europe. In the UK, the University of London (31) collaborates in exploring how to make urban tourism specialized and how modern transportation promotes urban tourism (Lin, 2017), and N8 Research Partnership collaborates in exploring how urban tourism policies can be learned internationally (González, 2011). In the Netherlands, Delft University of Technology (24) collaborates on how travel time uncertainty affects urban tourism and corresponding countermeasures to enhance travel efficiency (Zheng and Van Zuylen, 2013).

(3) Institutions in North America are less active but more influential. Among the top 10 collaborative institutions, there is only one institution in North America (the University of California System), but its centrality is relatively high (0.12), demonstrating

its significant influence on collaboration. It collaborates on how urban conceptualization in globalization contributes to urban tourism (Smith and Timberlake, 2001).

To sum up, different institutions collaborate on different topics, and we suggest scholars look for potential collaborative institutions based on their primary research interests and advantages.

Figure 5 shows the institution collaboration clusters, with 496 nodes and 723 links. Clusters clearly show the main collaboration topics among institutions. We want to highlight that some institutions in Table 4 may not be shown in Figure 5, while some institutions in Figure 5 are not shown in Table 4. That is because Table 4 ranks the institutions by the most active collaboration without considering topics or clusters (namely absolute value), whereas Figure 5 shows the two most active collaborative institutions within the corresponding clusters (namely relative value in each cluster). We set the parameter to show only two nodes (namely institutions in this figure) wishing to intuitively depict the most representative ones within the clusters to readers. For instance, Tongji University ranks the 6th in Table 4, but as it is relatively less representative than the 2nd and 4th ones (Hong Kong Polytechnic University and Southeast University-China), it is omitted in Figure 5. The scenario also applies to subsequent analysis.

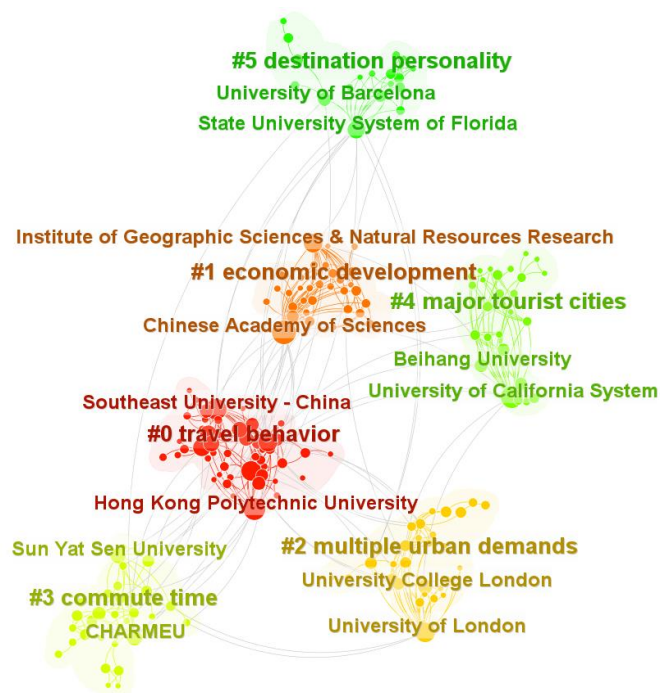


Figure 5. Institution Collaboration Clusters

(1) Some clusters analyze urban tourism from people's microscope view, such as "travel behavior" (#0) and "commute time" (#3). Specifically, the cluster "travel behavior," represented by Southeast University-China and Hong Kong Polytechnic University, explores detailed characteristics and influencing factors of tourist behaviors in the urban tourism process; for instance, hotel locations and geographic barriers may affect their traveling decisions (Shoval et al., 2011); the cluster "commute time," represented by CHARM EU and Sun Yat-Sen University, explores the coordination between commuting time and urban tourism, such as how travel time (by bus or on foot)

affects tourist' intentions and satisfactions, how commuting time can be used to evaluate accessibility (Feng, 2017; Liu and Kwan, 2020).

(2) Some clusters analyze this field from macroscopic views, such as "economic development" (#1), "multiple urban demands" (#2), "major tourist cities" (#4), and "destination personality" (#5). For instance, "economic development (#1)," represented by the Chinese Academy of Sciences, explores the mutual interaction mechanisms between economic growth and urban tourism and proposes that sustainable urban tourism contributes to better economic growth (Liu et al., 2011; Mou et al., 2020). "Multiple urban demands (#2)," represented by the University of London, discusses how various urban needs promote urban tourism; for instance, the need to construct high-speed rails and protect historical sites accelerate local urban tourism (Nasser, 2003; Lin, 2017). "Major tourist cities (#4)," represented by the University of California System, focus on how representative tourism cities achieve urbanization to promote their tourism industries (Smith and Timberlake, 2001). "Destination personality (#5)," represented by the University of Barcelona, explores how local authorities personalize local tourism destinations to make brand marketing; giving cities proper "personal images" contributes to attracting more visitors (Papadimitriou et al., 2015).

To sum up, different institutions initiate cooperation from different perspectives; their collaboration links are intertwined, suggesting their collaborations with other institutions in other topics; we encourage institutions to expand collaborations to promote urban tourism research.

Region Collaboration

Table 5 lists the top 10 collaborative regions in this field. The most collaborative regions are China, the USA, and the UK's England.

Table 5. *Region Collaboration*

Ranking	Region	Count	Centrality
1	Peoples R China	698	0.17
2	USA	442	0.23
3	England, UK	174	0.29
4	Spain	166	0.21
5	Netherlands	93	0.05
6	Australia	92	0.03
7	Canada	76	0.09
8	South Korea	73	0.02
9	Germany	70	0.02
10	Japan	68	0.04

(1) The top three collaborative regions have different advantages in collaboration. For instance, China has the most enormous collaboration publication numbers (698), proving its leading role in quantity; England has the highest centrality (0.29), proving its influence in collaboration; the USA has the second most collaboration publication counts and the second highest centrality (442 and 0.23, respectively), proving its comprehensive collaboration dominance.

(2) When we refer to the node details, we find that the top three collaborative regions initiate cooperation on urban interactions with tourism, but the main focuses vary. For

instance, scholars in China emphasize urbanization's impacts on tourism, believing that better transportation networks, hotel locations, and urban service facilities change tourist behaviors (Shoval et al., 2011; Liu et al., 2015); scholars in the USA emphasize urban centrism's impacts on tourism, believing that evolving and aggregating urban forms change family's traveling intentions and decisions (Krizek, 2003; Weiss et al., 2018); scholars in England explore the urban planning's impacts on tourism, believing that understanding urban planning and urban form transformation, which is also called urban policy tourism, is beneficial to make cities globally known (González, 2011).

In conclusion, these three regions are influential in collaborating in this field; scholars can pay more attention to seeking potential collaborators in these regions to increase the possibility of success.

Figure 6 demonstrates regional collaborations with 98 nodes and 556 links.

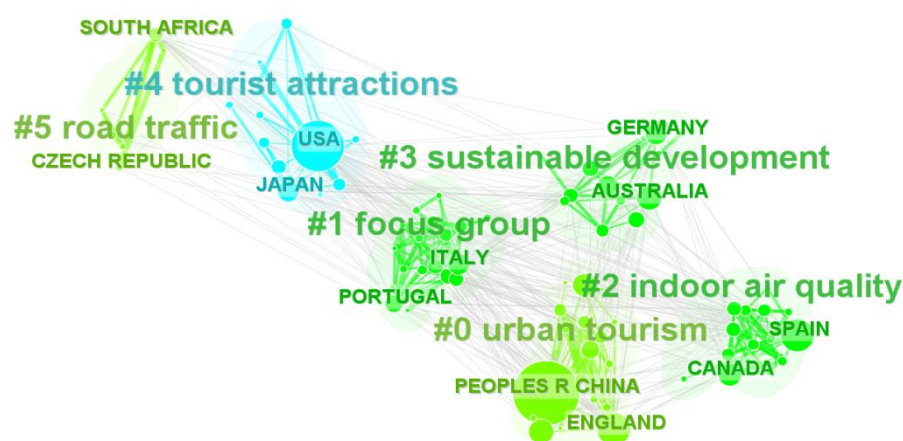


Figure 6. Region Collaboration Clusters

(1) Some clusters are directly related to this field, such as "urban tourism" (#0) and "focus group" (#1). The former cluster, represented by China and the UK's England, emphasizes the importance of the theoretical study of urban tourism, proposing that a scientific agenda help solve practical issues such as hotel site selection and public transportation effectiveness (Ashworth and Page, 2011; Shoval et al., 2011; Liu et al., 2015). The latter cluster, represented by Italy and Portugal, emphasizes the importance of exploring target groups, proposing that various approaches (such as questionnaires) can be used to collect focus group data to enhance urban tourism design and experience (Ramires et al., 2018).

(2) Some clusters emphasize the factors interacting with urban tourism, such as "indoor air quality" (#2), "sustainable development" (#3), tourism attractions" (#4), and "road traffic" (#5). Specifically, the cluster "indoor air quality" (#2), represented by Spain and Canada, discusses the impacts of indoor air quality on urban tourism performances; for instance, reasonable accommodation environment of apartments on the Airbnb platform attracts more tourists (Gutiérrez et al., 2017). The cluster "sustainable development" (#3), represented by Germany and Australia, examines how urban tourism contributes to sustainability; for instance, urban tourism activities require local authorities to preserve local historic cityscape and cultural heritages and thus promote sustainability of urban tourism (García-Hernández et al., 2017). The cluster "tourism attractions" (#4), represented by the USA and Japan, takes different tourism attractions as examples,

discusses travel behaviors (such as pedestrian travel) for metropolitan cities, and assesses their correlation with tourism attraction forms (Kerr et al., 2007; Dissanayake et al., 2012). The cluster "road traffic" (#5), represented by South Africa and the Czech Republic, studies how optimized road traffic promotes urban tourism (Venter et al., 2007).

Author Collaboration

Table 6 lists the top 10 collaborators in this field. Overall, author collaborations are less notable than institutional and regional collaborations, with only six authors having five or more collaborations. Authors' institutions with the corresponding regions are also shown in Table 6.

Table 6. Author Collaboration

Ranking	Author	Institution	Region	Count	Centrality
1	Susilo, Yusak O	KTH Royal Institute of Technology	Sweden	6	0
2	Sheng, Li	Macao Polytechnic Institute	China	6	0
3	Zhang, Jiekuan	Guilin Tourism University	China	5	0
4	Carvache-franco, Wilmer	Escuela Superior Politécnica del Litoral	Ecuador	5	0
5	Carvache-franco, Orly	Federal University of Espírito Santo	Ecuador	5	0
6	Rundmo, Torbjorn	Norwegian University of Science and Technology	Norway	5	0
7	Tang, Jinjun	Central South University	China	4	0
8	Park, Sangwon	Kyung Hee University	South Korea	4	0
9	Carvache-franco, Mauricio	Espiritu Santo University	Ecuador	4	0
10	Wang, Xize	National University of Singapore	Singapore	4	0

(1) Notable collaborators have various collaboration topics, showing the research diversity of this field. For instance, the most active collaborators are Yusak O Susilo and Li Sheng (6 counts); the former's collaboration is from the micro perspective by focusing on how individuals' attitudes impact travel choices and behaviors (Susilo et al., 2012), while the latter is from the macro perspective by focusing on the impacts of tourism specialization and economic diversification on tourist cities (Sheng, 2011a,b,c). The following active collaborators (4-5 counts) also cover different topics; for instance, Jiekuan Zhang collaborates from the environmental perspective by focusing on the impact of climate change on urban tourism policies and how low-carbon urban tourism evolves (Zhang and Zhang, 2020a,b); Torbjorn Rundmo collaborates from the traffic perspective by focusing on how convenient and safe traffic, public transportation use, and private cars affect traveling congestions and effectiveness (Lind et al., 2015; Nordfjærn et al., 2015; Simsekoglu et al., 2015); Jinjun Tang collaborates in temporal-spatial comparison between urban residents' travel modes (Tang et al., 2019; Zhang et al., 2019); Sangwon Park collaborates from a multidisciplinary perspective, exploring technology innovation's contribution to solve travel congestions and promote urban tourism (Park et al., 2022; Park and Zhong, 2022).

(2) There may have been "kinship collaborations" among the collaborative authors. For instance, Wilmer Carvache-Franco, Orly Carvache-Franco, and Mauricio Carvache-

Franco collaborate frequently; judging from their surnames, they may have some kinship connections. Taking different regions as examples, they examine how different factors in urban tourism affect tourists' perceptions and behaviors. For instance, Mexico City and Lima, two famous tourist cities with distinctive cultural heritages, have different influencing factors in attracting tourists; in addition, tourists to Mecca for pilgrimage indicate that religion is also a positive factor in urban tourism (Hassan et al., 2022; Regalado-Pezua et al., 2022; Sirkis et al., 2022).

Notably, the centralities of these collaborative authors are 0, indicating their relatively weak connections and influences compared with regional and institutional collaborations. In other words, authors have a long way to go in cooperation. We suggest that future scholars deepen collaboration and explore topics of urban tourism in a multidisciplinary way.

Figure 7 shows the clusters of author collaborations. Due to the large number of nodes in each cluster, this study chose to display the top two nodes (namely authors in Figure 7) in the parameter setting to highlight the most representative ones in each corresponding cluster.

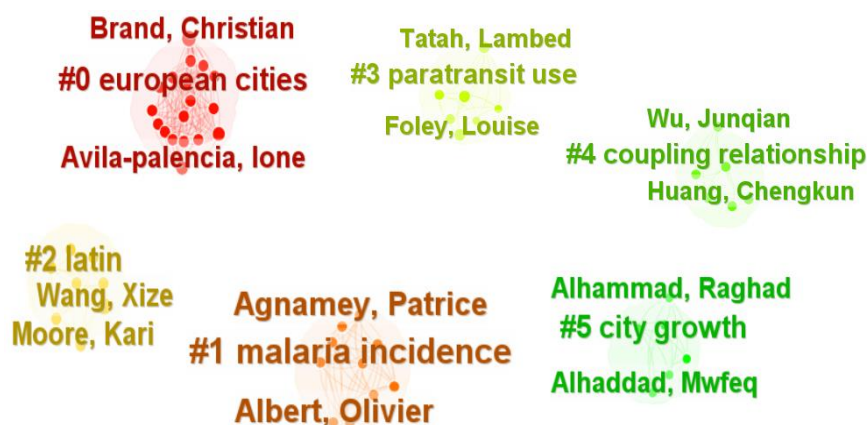


Figure 7. Author Collaboration Clusters

(1) Some clusters are region-specific, namely "European cities" (#0), "Latin" (#2), and "malaria incidence" (#1). Specifically, "European cities" (#0), represented by Lone Avila-Palencia and Christian Brand, focuses on European cities' urban tourism issues, proposing that decreasing energy consumption and better public health services and residents' living quality in European cities enhance their urban tourism effectiveness (Brand et al., 2021a,b; Li et al., 2018b). "Latin" (#2), represented by Xize Wang and Kari Moore, mainly focuses on urban travel issues in Latin regions, proposing that predicting travel time, paying attention to the traffic conditions, and using technologies can effectively improve travel problems (Wang, 2019; Boarnet and Wang, 2019; Delclos-Alio et al., 2022; Guimaraes et al., 2022). "Malaria incidence" (#1) focuses on the health issues in urban tourism of specific regions; for example, a representative study explores situations, trends, and countermeasures of malaria prevalence among tourists traveling to megacities in France (Kendjo et al., 2019).

(2) Some clusters are factor-specific, namely "paratransit use" (#3), "coupling relationship" (#4), and "city growth" (#5). For instance, "paratransit use" (#3) mainly focuses on applying paratransit in urban tourism. Paratransit refers to a diverse transit

system for the physically inconvenienced persons with flexible schedules or routes; studies believe that paratransit improves urban forms, provides more traveling choices, makes urban tourism convenient, and enhances tourism experiences (Goel et al., 2023; Randall et al., 2023; Tatah et al., 2023); "coupling relationship" (#4) focuses on the coupling interactions between urban tourism and tourism resources, proposing that urban tourism and related elements (such as environmental governance, cultural heritage protection and land use) promote mutually (Geng et al., 2021, 2022; Huang et al., 2021); "city growth" (#5) focuses on the impacts of urban expansion and population growth on urban tourism development, proposing increasing population quantity and density may hinder urban tourism to some degree (Al Shawabkeh et al., 2023).

The above results again prove the multi-disciplinarity of this field; thus, we suggest scholars initiate multidisciplinary research to find possible breakthroughs in urban tourism.

Co-citation Analysis

Co-citation analysis from journal, reference, and author perspectives helps us know the current research status and what topics are highly emphasized.

Journal Co-citation

Table 7 lists the top 10 co-cited journals in urban tourism. These co-cited journals are highly qualified, as eight are in Q1.

Table 7. Journal Co-citation

Ranking	Cited Journal	Publisher	Count	Centrality	Year	Quartile in Category
1	Tourism Manage	Elsevier	713	0.04	2002	Q1
2	Ann Tourism Res	Elsevier	650	0.08	2000	Q1
3	Transport Res Rec	US National Research Council	592	0.06	2000	Q3
4	Transport Res A-Pol	Elsevier	573	0.06	2000	Q1
5	J Transp Geogr	Elsevier	480	0.04	2006	Q1
6	Sustainability-Basel	MDPI	465	0.01	2017	Q2
7	Transportation	Springer	430	0.06	2000	Q1
8	Urban Stud	SAGE	415	0.06	2000	Q1
9	Transport Policy	Elsevier	389	0.03	2000	Q1
10	Cities	Elsevier	376	0.05	2001	Q1

(1) The most co-cited journal is not the most influential in this field. Specifically, "Tourism Management" is the most co-cited with 713 counts, whereas its centrality is not the first (0.04); comparatively, the second co-cited journal, "Annals of Tourism Research," has the highest centrality (0.08), which has a more substantial relative influence.

(2) Journals have focused on urban tourism since the early years. Specifically, nine journals were co-cited between 2000 and 2006; six have been co-cited since 2000, proving the early attention of scholars. However, we must admit these journals have relatively low centrality (below 0.1), demonstrating their less influence in this field.

The above analysis suggests that journal editors in this field attract more high-quality papers to make journals more influential in this field.

Figure 8 shows the journal co-citation clusters with 938 nodes and 6848 links.

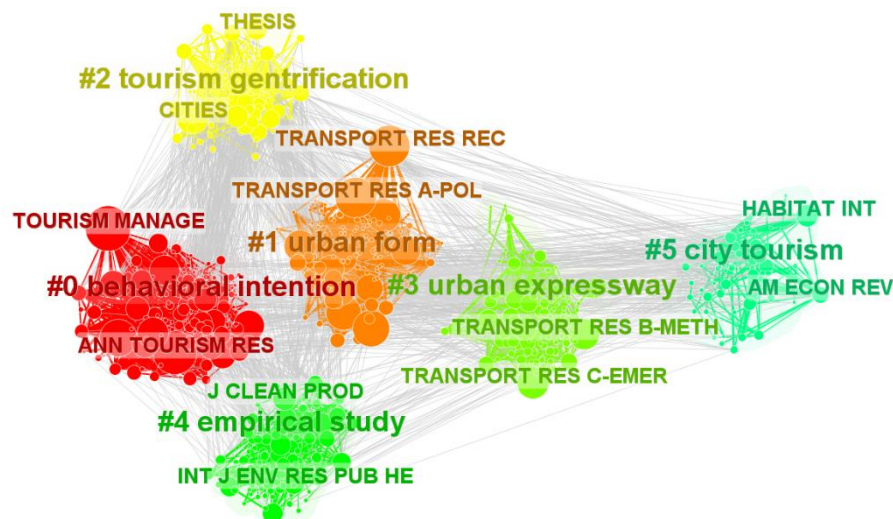


Figure 8. Journal Co-citation Clusters

(1) Some clusters emphasize tourists' behavior in urban tourism, such as "behavioral intention" (#0). Behavior intention refers to the behavioral tendency individuals have in given situations. Represented by the journals "Tourism Management" and "Annals of Tourism Research," some studies explore "why": why tourists visit cities; for instance, one representative study believes that tourists go for urban tourism because of specific features of cities (Ashworth and Page, 2011); some studies explore "how": how to affect tourist behaviors in specific scenarios; one representative study believes that pictures on APP are effective in depicting the tourism resources and changing tourists preferences in choosing proper tourism services (Gutiérrez et al., 2017).

(2) Some clusters focus on the impact of urban tourism on cities, such as "urban form" (#1), "tourism gentrification" (#2), and "urban expressway" (#3). In particular, "urban form" (#1) describes the correlation between urban form and tourist behaviors: urban structure influences travelers' behaviors, which in turn influences urban tourism growth and changes urban form (Krizek, 2003; Bento et al., 2005). "Tourism gentrification" (#2) examines how the unequal distribution of urban resources caused by urban tourism changes cities; for instance, the unevenly distributed facilities, services, and tourism resources in cities may lead to the fact that original residents leave, tourism practitioners come and live, and urban structure changes (Weiss et al., 2018). It is proved that rich, old, educated tourists are more likely to visit cities; the hotels they live in may be luxurious, increasing nearby land prices, causing residents to leave, and causing tourism gentrification (Ashworth and Page, 2011). "Urban expressway" (#3) mainly explores travel behaviors on urban expressways; representative studies have concluded that technologies such as GPS detectors can be used to observe traffic situations and infer travel time, which is beneficial to enhance a city's operation efficiency (Jenelius and Koutsopoulos, 2013; Liu et al., 2015).

(3) Some clusters emphasize urban tourism research, such as "empirical study" (#4) and "city tourism" (#5); the former one (represented by "Journal of Cleaner Production") proposes that empirical study is practical in this field, and the latter one (represented by "Habitat International") demonstrates the correlation significance between urban tourism and other factors. For example, in the cluster "empirical study" (#4), some studies successfully use the empirical studies to compare different traveling modes and urban functions, finding that proper traffic tools and targeted urban function upgradation are effective in stimulating urban traveling (de Nazelle et al., 2017; Romao et al., 2018). In the cluster "city tourism" (#5), some studies explore the correlation between urban tourism and urbanization, nearby villages, and sanitation problems, proving that urban tourism is complicatedly intertwined with other factors (Colak et al., 2016; Rasoolimanesh et al., 2017).

In addition, we find that these clusters are intertwined with many links, proving that the detailed topics of clusters may intertwined and overlapped. Therefore, scholars may expand their focus and interests when researching this field.

Reference Co-citation

Reference co-citations reveal the authoritative papers in this field. *Table 8* shows the top 10 co-cited references.

Table 8. Reference Co-citation

Ranking	Cited Reference	Count	Centrality	Year
1	Garcia-Hernandez M, 2017, Sustainability-Basel, V9, P0	25	0.05	2017
2	Ewing R, 2010, J AM Plann Assoc, V76, P265	23	0.11	2010
3	Gossling S, 2021, J Sustain Tour, V29, P1	23	0.04	2021
4	Wachsmuth D, 2018, Environ Plann A, V50, P1147	22	0.02	2018
5	Koens K, 2018, Sustainability-Basel, V10, P0	22	0.01	2018
6	Gutierrez J, 2017, Tourism Manage, V62, P278	21	0.06	2017
7	Ashworth G, 2011, Tourism Manage, V32, P1	19	0.21	2011
8	Li JJ, 2018, Tourism Manage, V68, P301	16	0.01	2018
9	Seraphin H, 2018, J Destin Mark Manage, V9, P374	15	0.02	2018
10	Cocola-Gant A, 2021, Environ Plann A, V53, P1671	14	0.05	2021

(1) Papers in journals "Tourism Management," "Environment and Planning A," and "Sustainability-Basel" are more likely to be highly co-cited in this field as they enjoy 3, 2, and 2 highly co-cited references. Specifically, for "Tourism Management," the co-cited references discuss accommodation's impacts on urban tourism, the progress and paradox of urban tourism, and the use of big data in urban tourism research (Ashworth and Page, 2011; Gutiérrez et al., 2017; Li et al., 2018a). For "Environment and Planning A," the co-cited references discuss the sharing economy in urban tourism; one believes that a short-term lease of sharing apartments provides a new way to obtain potential revenue, while the other believes that such a lease will increase tenants' insecurities and concerns (Wachsmuth and Weisler, 2018; Cocola-Gant and Gago, 2021). For "Sustainability-Basel," the highly co-cited references explore the overdevelopment of urban tourism, believing that over-tourism harms local cultural heritage and the environment (García-Hernández et al., 2017; Koens et al., 2018).

(2) Some co-cited references discuss the interactions between urban tourism and other factors, such as ecological survival, land planning, city construction, and pandemics. For instance, Seraphin H's reference explores how over-tourism threat the local ecological status (Seraphin et al., 2018); Ewing R's reference depicts the correlation between land planning, urban design, and traveling (Ewing and Cervero, 2010); Gössling S's reference compares different pandemics to explore how they affect local urban tourism growth (Gössling et al., 2021).

In addition, we find that Ashworth G's reference has the highest centrality (0.21), demonstrating its critical connections in this field. It is a review; therefore, scholars who wish to enhance influence in this field can try publishing review papers.

Figure 9 shows reference co-citation clusters with 999 nodes and 2626 links.

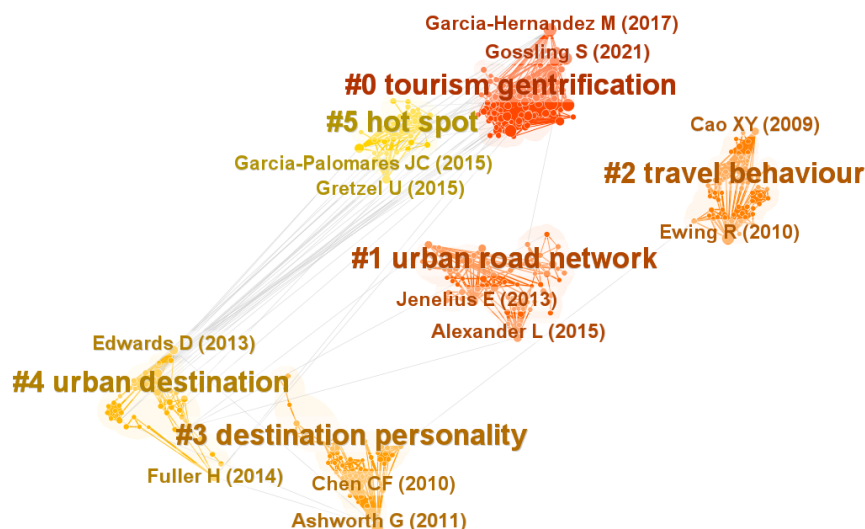


Figure 9. Reference Co-citation Clusters

(1) Many clusters emphasize "city," such as "tourism gentrification" (#0), "urban road network" (#1), "destination personality" (#3), and "urban destination" (#4). Specifically, "tourism gentrification" (#0) emphasizes the correlations between urban tourism and gentrification; studies propose that tourism gentrification may affect tourists and residents' lives (such as increasing prices of commodities, homeless issues, and losing commercials) and epidemics may affect tourism gentrification process (García-Hernández et al., 2017; Gössling et al., 2021). "Urban road network" (#1) emphasizes the correlations between traveling and urban traffic; studies propose that travelers' motion trails can be monitored and analyzed to optimize urban road networks and promote urban tourism growth; besides, travelers' mobile data can also be used to predict travel time and improve traffic issues of urban tourism (Alexander et al., 2015; Jenelius and Koutsopoulos, 2013). Co-cited references in the cluster "Destination personality" (#3) mainly propose that urban tourism destinations can be positioned with distinctive personalities and characteristics, which is beneficial to attract more visitors; for instance, some studies believe that markets, monuments, museums, and cultural relics in cities play positive roles in shaping urban images and specialties and enhancing tourists' focus and experiences (Chen and Chen, 2010; Ashworth and Page, 2011). "Urban destination" (#4) emphasizes how urban tourism contributes to urban destinations' development; for

instance, some studies demonstrate that GPS locations to travelers and real-and-deep urban tourism experiences stimulate city operators to manage cities smartly (Edwards and Griffin, 2013; Füller and Michel, 2014).

(2) Some clusters emphasize travelers and research hotspots, such as "travel behavior" (#2) and "hot spot" (#5). "Travel behavior" (#2) emphasizes tourists' complicated traveling behavior decisions; some studies explore tourists' choices: by analyzing how and why tourists make decisions, stakeholders can take corresponding actions precisely (Cao et al., 2009); some studies explore factors affecting behavior decisions: building environment and road infrastructures affect tourist behaviors (Ewing and Cervero, 2010). "Hot spot" (#5) explores the potential trends in this field; for instance, some studies propose that future research may emphasize the significance of image recognition in analyzing and predicting tour destinations' attractiveness and smart urban tourism growth (Gretzel et al., 2015; García-Hernández et al., 2017).

In conclusion, this field covers various topics. Thus, we encourage scholars to read more to obtain new insights in this field.

Author Co-citation

Highly co-cited author analysis helps us know this field's highly focused and influential authors. *Table 9* lists the top 10 co-cited non-anonymous authors.

Table 9. *Author Co-citation*

Ranking	Cited Author	Institution	Region	Count	Centrality
1	Cervero R	University of California, Berkeley	USA	180	0.12
2	Ewing R	Rutgers University	USA	159	0.07
3	Ashworth G	University of Groningen	Netherlands	111	0.10
4	Yang Y	University of Florida	USA	95	0.03
5	Richards G	Tilburg University	Netherlands	90	0.02
6	Gossling S	Lund University	Sweden	86	0.02
7	Handy S	California University	USA	86	0.02
8	Mckercher B	The Hong Kong Polytechnic University	China	86	0.04
9	Cao XY	University of Minnesota	USA	83	0.03
10	Hall CM	University of Canterbury	New Zealand	81	0.05

(1) Cervero R, Ewing R, and Ashworth G occupy significant positions in this field. Their co-citation counts, centrality, and co-cited year are all in the top 3, demonstrating their popularity and influence in this field. Cervero R is the most significant among them, as this author ranks the first in these three aspects. This author mainly discusses the impacts of sharing cars: they change travelers' commuting attitudes and behaviors and even reduce personal car ownership in the long term (Cervero et al., 2007). Besides, Ewing R mainly explores the relationship between travel and the built environment, proposing that built environment can moderate travel demand (Ewing and Cervero, 2001, 2010); Ashworth G mainly discusses paradoxes in urban tourism to make scholars understand this field critically; this author emphasizes that the progress of this field depends on other disciplines' theories and contributions (Ashworth and Page, 2011).

(2) Some co-cited authors use limited papers to get more influence. Hall CM is the typical example: this author has 81 co-citation counts with 0.05 centrality, proving its research efficiency in publishing influential papers. The latest representative documents

of this author explore how epidemics affect local society, economy, tourism destination recovery, and the tourism industry, proposing that global approaches are needed to achieve sustainable tourism under epidemics (Hall et al., 2020; Gössling et al., 2021).

The above results show that urban tourism covers many niche topics practically and theoretically, such as internationalization, sports, induced demands, and paradoxes of urban tourism. They provide hints for scholars to choose proper research topics in the future.

Author co-citation networks are intended to show the main topics of interest to authors in urban tourism. *Figure 10* shows the author's co-citation clusters, which consist of 1,125 nodes and 5,897 links.

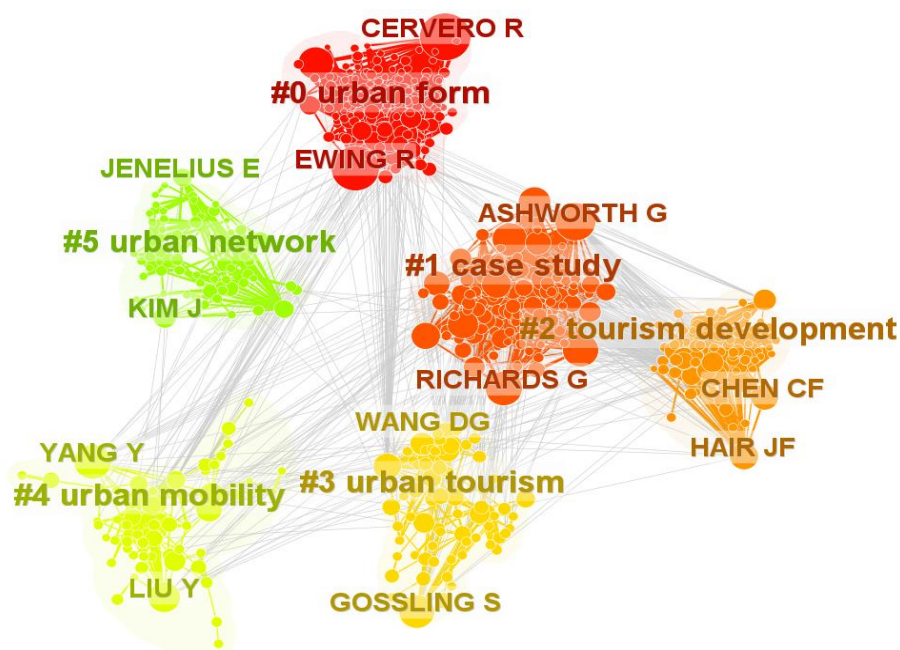


Figure 10. Author Co-citation Clusters

(1) Some co-cited authors focus on urban space and planning, including "urban form" (#0), "urban mobility" (#4), and "urban network" (#5). Specifically, "urban form" (#0) has been discussed in *Figure 8*; this cluster emphasizes that urban forms affect the choices of travel modes, and travel mode changes may change urban forms, too (Dieleman et al., 2002; Krizek, 2003; Schwanen et al., 2004; Schlossberg et al., 2006). Besides, "urban mobility" (#4) refers to the mobility of urban residents. Representative co-cited authors propose that some factors (such as epidemics, travel distance, and vehicles) may affect residents' mobilities and urban tourism performances (Sun et al., 2016; Zhang et al., 2017a; Wang et al., 2020; Li et al., 2021). Furthermore, "urban network" (#5) refers to the urban transportation network and its technology. Representative co-cited authors propose that new analysis technologies (such as social media message's spatial and semantic analysis and network-motivated approach) can be used to predict travel time, optimize travel routes, make tourism smarter and demand-specific, and contribute to better urban tourism growth (Brandt et al., 2017; Saberi et al., 2017; Zhang et al., 2017b; Jenelius and Koutsopoulos, 2018).

(2) Some co-cited authors focus on tourism issues by emphasizing a variety of influences on urban tourism, including "tourism development" (#2) and "urban tourism" (#3). Specifically, "tourism development" (#2) emphasizes factors affecting urban tourism industry growth; representative co-cited scholars explore how pressure from tourism, tourists' initial impressions, tourist emotions, residents' support, and urban tourism heritage protection are correlated with urban tourism industry growth (Papadimitriou et al., 2015; Rasoolimanesh et al., 2017; García-Hernández et al., 2017; Dieck and Jung, 2018). In addition, "urban tourism" (#3) is discussed in *Figure 6*, which explores the theoretical progress of urban tourism research.

(3) Some clusters focus on research methodologies, such as "case study" (#1), referring to the study by selecting specific individuals or groups as examples. For instance, one representative study uses Lisbon as the case to explore how "touristification" and "Airbnbisation" destroy the local community's "gentrification" and "studentification" (Sequera and Nofre, 2020); one selects Melbourne as the case to explore how tourism agencies, operators, and tourists achieve tourist social responsibility (Miller et al., 2015); one selects Panoramio, Foursquare, and Twitter as cases to compare and analyze tourist behaviors in cities (Salas-Olmedo et al., 2018). Case studies apply to many topics in this field, such as over-tourism and sustainable tourism (Song et al., 2020; Wu et al., 2023).

In conclusion, the co-cited authors mainly explore this field from "urban" and "tourism" perspectives. Their detailed topics provide us with insights to explore further in the future.

Co-occurrence Analysis

Co-occurrence analysis is valuable for exploring research progress and identifying potential hotspots in the future.

Category Co-occurrence

Table 10 shows the top 10 co-occurring categories in urban tourism research. In general, we find that the top co-occurring and publication categories are the similar (*Table 10* and *Table 2*), proving the popularity of these categories in urban tourism research. We want to highlight that although there are some similarities between *Table 10* and *Table 2* (they have the same categories but different ordering), *Table 10* mainly reflects category co-occurrence, a phenomenon in which category information co-occurs, and *Table 2* only indicates quantity of papers in different categories. Therefore, though they are similar, they cannot be merged.

Table 10. Category Co-occurrence

Ranking	Category	Count	Centrality	Year
1	Environmental Studies	439	0.18	2000
2	Transportation	396	0.08	2000
3	Environmental Sciences	396	0.26	2002
4	Hospitality Leisure Sport Tourism	347	0.01	2000
5	Transportation Science & Technology	338	0.03	2000
6	Green Sustainable Science & Technology	293	0.02	2009
7	Civil Engineering	240	0.08	2000
8	Economics	203	0.12	2001
9	Urban Studies	176	0.09	2000
10	Geography	160	0.20	2000

(1) Four categories have centrality above 0.1, demonstrating their influences and significance in this field. Specifically, they are environmental studies (0.18), environmental sciences (0.26), economics (0.12), and geography (0.20). That proves that scholars are paying more attention to environmental, economic, and human geography-related issues in urban tourism. In addition, environment-related papers reached 835 counts, indicating that scholars pay much attention to the interactions between urban tourism and the environment. That matches previous analysis: many studies have emphasized the relationship between building environment, climate change, environmental governance, and urban tourism.

(2) Co-occurring categories have played important roles since the early years. The top 10 co-occurring categories begin early (around 2000), proving their continuous influence and popularity on urban tourism. Specifically, environmental protection, transportation, entertainment, and urban construction in urban tourism are focused. That also again proves the relative multidisciplinary character of this field.

In conclusion, we encourage scholars to expand their research interests and pursue multidisciplinary research in this field.

Figure 11 shows the category co-occurrence clusters, with 145 nodes and 403 links. Previous analyses have mentioned some clusters, and some new clusters tell different stories.

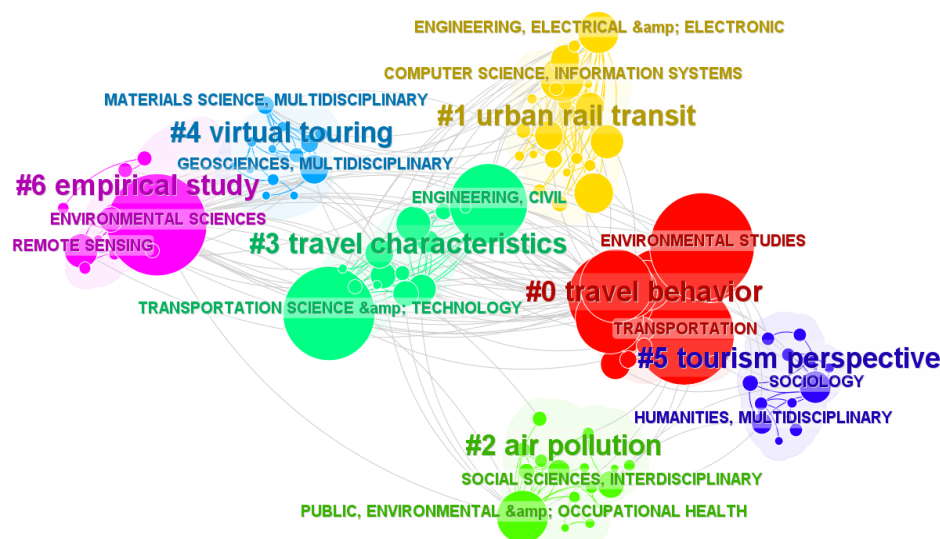


Figure 11. Category Co-occurrence Clusters

(1) Some clusters are famous and have been discussed in previous analyses, such as "travel behavior" (#0) and "empirical study" (#6). The former emphasizes traveler's decisions, influencing factors, and possible impacts; the latter emphasizes the importance and application of "data analysis" in urban tourism research. Some empirical approaches have been used, such as entropy weight analysis, TOPSIS method, and estimation of distribution algorithm (Shi et al., 2017; Geng and Zhang, 2021; Geng et al., 2022).

(2) Some clusters emphasize positive and negative factors affecting urban tourism, such as "urban rail transit" (#1), "virtual touring" (#4), "tourism perspective" (#5), "air pollution" (#2), and "travel characteristics" (#3). Specifically, "urban rail transit" (#1) investigates the application of urban rail transit in urban travel. Studies conclude its

positive role in urban tourism: urban rail transit makes the prediction of tourists' travel possible, facilitates better urban road planning, and helps tourists make travel plans quickly (Kumar et al., 2005; Vansteenwegen et al., 2011; Zhang et al., 2016; Liu et al., 2017b). Besides, "virtual touring" (#4) refers to virtual tourism to authentic tour destinations by utilizing new technologies such as geo-sensing and virtual reality; studies propose that virtual tourism is positive in exhibiting urban tourism space and cultural heritage at minimal costs (Sassa et al., 2004; Koutsoudis et al., 2007). Furthermore, the "tourism perspective" (#5) emphasizes the social and humanistic values of urban tourism; studies propose that urban tourism gives tourists belongingness to cities, and city-walk tours have "critical cosmopolitanism" (Santos, 2012, 2019). In addition, "air pollution" (#2) explores pollution issues during urban tourism; some studies explore how urban traveling increases air pollution, what problems may have (such as epidemic diseases), what challenges we encounter, and what countermeasures to take to decrease air pollution caused by urban tourism (Cooley et al., 2011; Hankey et al., 2017). What is more, "travel characteristics" (#3) explore specific travel features in urban tourism from various perspectives, such as city form, road condition, electric vehicle use, commuting time, and carbon emission (Bento et al., 2005; Vance and Hedel, 2007; Weinert et al., 2007).

The above results provide valuable references to scholars about the current research progress in this field.

Keyword Co-occurrence

The keyword co-occurrence analysis examines the field's evolution and helps us understand future research hotspots in this area. *Table 11* shows the top 10 co-occurring keywords.

Table 11. *Keyword Co-occurrence*

Ranking	Keyword	Count	Centrality	Year
1	city	191	0.07	2001
2	behavior	175	0.09	2000
3	impact	175	0.07	2001
4	model	170	0.07	2005
5	urban tourism	122	0.04	2001
6	built environment	111	0.02	2007
7	land use	109	0.04	2000
8	transport	105	0.03	2001
9	demand	95	0.06	2003
10	patterns	87	0.03	2004

(1) Several co-occurring keywords are directly relevant to the field, such as "city and "urban tourism." Specifically, "city" has the highest co-occurrence frequency (191) and higher centrality (0.07); "urban tourism" also has a high co-occurrence frequency (122), suggesting these keywords are essential to the research. The representative studies in these clusters propose that scholars are encouraged to construct frameworks to clarify research scopes, analyze problems, and explore the essence of urban tourism (Pearce, 2001; Smith and Timberlake, 2001).

(2) The co-occurring keyword "behavior" deserves attention because it has the highest centrality (0.09) and the earliest co-occurring year (2020), indicating its long crucial

status in this field. "Behavior" has been discussed in previous analyses, including tourist behaviors, traveling choices, and influencing factors on tourist behaviors. This co-occurring keyword proves that research in this field has paid much attention to understanding what and how tourists act.

(3) The two co-occurring keywords with high centrality are "impact" (0.07) and "model" (0.07), implying that these words dominate urban tourism research. They also have been discussed previously; "impact" focuses on the mutual impacts between urban tourism and other factors such as city, society, environment, behavior, and psychological changes (Pearce, 2001; Badau and Badau, 2018; Guan and Guo, 2022; Tao et al., 2023); "model" emphasizes that scholars can use theoretical and statistical models to study urban tourism issues (Bento et al., 2005; Veldhuisen et al., 2005).

In conclusion, these highlighted co-occurring keywords assist researchers in identifying the key to conducting research in urban tourism.

The keyword co-occurrence timeline, shown in *Figure 12*, aims to understand the evolution of the most discussed topics in urban tourism. There are 590 nodes and 2,168 links in the figure.

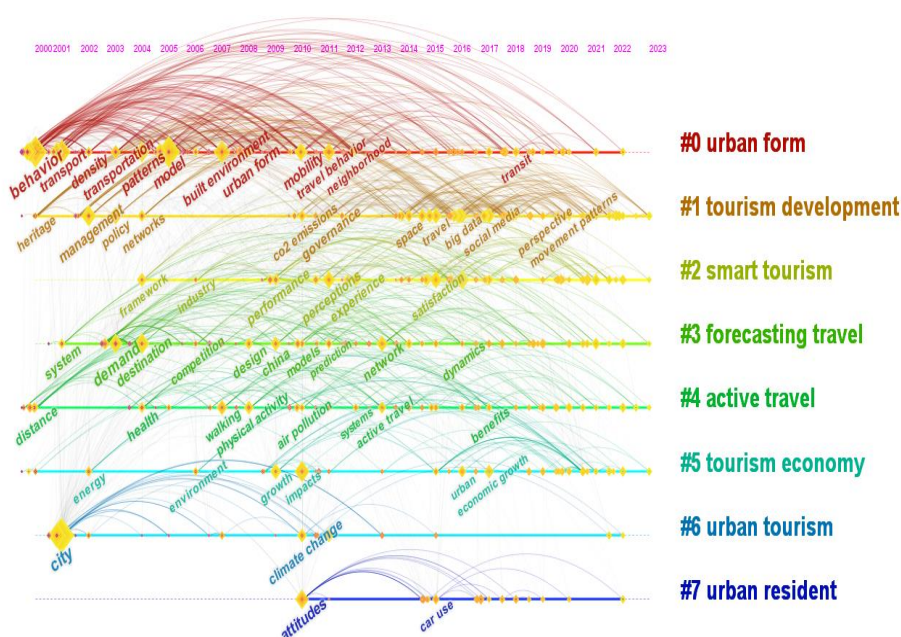


Figure 12. Keyword Co-occurrence Cluster Timeline

(1) Clusters with the most prolonged durations are "tourism development" (#1), "active travel" (#4), and "tourism economy" (#5) (from 2000 to 2023). The main topics of these clusters evolve temporally.

"Tourism development" (#1) has been discussed previously; in the early stage (before 2010), studies in this cluster mainly focused on local authorities' sustainable management in urban tourism development (González, 2011; Russo, 2002); in the middle stage (2011-2020), carbon emissions, space and environmental governance issues caused by urban tourism growth were concerned (Alvarez-Sousa, 2018; Caldeira and Kastenholz, 2020; Dolnicar et al., 2010); in the recent stage (2021-2023), scholars believe that tourism development should be explored with multiple and extended perspectives (Ruiz-Guerra et al., 2019).

"Active travel" (#4) explores influencing factors to stimulate tourist travel actively. In the early stages, travel distance and health issues were the primary factors for active travel (Basu and Cooper, 2000; Frank et al., 2008); later, environment pollution and transportation systems were focused on (Parry and Timilsina, 2010; Liu et al., 2017a); recently, the benefits of active travel are focused on (Brand et al., 2021a).

"Tourism economy" (#5) concerns the growth of the urban tourism industry. Earlier studies mainly emphasized the impacts of energy and the environment on the growth of the urban tourism economy (Petrov et al., 2009; Qureshi et al., 2017; Zeng et al., 2021); recently, studies have explored how urbanization promotes the urban tourism economy (Geng and Zhang, 2021).

(2) The relatively new cluster is "urban resident" (#7), which mainly explores urban residents' attitudes and behaviors towards urban tourism. Initially, studies explore how residents' attitudes (support or opposition) affect local urban tourism (Yuan et al., 2019); later, studies explore how residents' behaviors, such as car use, affect urban tourism performances with sustainability (Lind et al., 2015). This cluster has limited co-occurring keywords, demonstrating its relatively low popularity in this field. We must admit that urban tourism research is more welcomed from a tourist rather than a resident perspective.

In conclusion, we suggest scholars explore future topics from macro or microscopes, tourists or local residents, and city or tourism.

Keyword Burst

Keyword burst aims to explore the hotspots and emerging trends in urban tourism. *Figure 13* shows the top 20 keywords with the strongest citation bursts in urban tourism between 2000 and 2023. We can find that the hotspots of urban tourism have been changing over time.

(1) The top 5 keywords with the earliest bursts are "form" (2000), "land use" (2005), "travel behavior" (2008), "travel time" (2010), and "models" (2010), which indicate that urban forms, land use in urban planning, tourists' behavior and time, and research models are relatively early in urban tourism research. They have laid a foundation for urban tourism research.

(2) The top 5 keywords with the most vigorous bursts are "land use" (8.81), "time" (6.11), "travel behavior" (5.88), "choice" (5.82), and "travel time" (5.39). They are the key focus of the field and the turning points of research interest; these words cover different aspects of urban tourism, such as urban planning, transportation, and consumer decisions, demonstrating that this field is relatively multidisciplinary and scholars have been paying much attention to them.

(3) The top 5 keywords with the most prolonged bursts are "form" (17 years), "land use" (10), "travel behavior" (6), "models" (6), and "distance" (5), implying that scholars have paid attention to these keywords for a long time. We find that keywords with the earliest, strongest, and most prolonged bursts highly overlap (such as "land use" and "travel behavior"), demonstrating their fundamental roles in urban tourism research.

(4) The top 5 keywords with the latest bursts are "image," "high-speed rail," "loyalty," "framework," and "services"; they represent the frontiers in urban tourism research. We can infer that recent urban tourism research mainly focuses on how to improve a city's hard power (such as high-speed rail) and soft power (such as services) to enhance urban tourism performances (loyalty and services); besides, recent studies focus on using new frameworks to solve practical problems.

In conclusion, influential keywords were limited in the past, but new topics have emerged; scholars need to expand their horizons to explore urban tourism research with new insights.

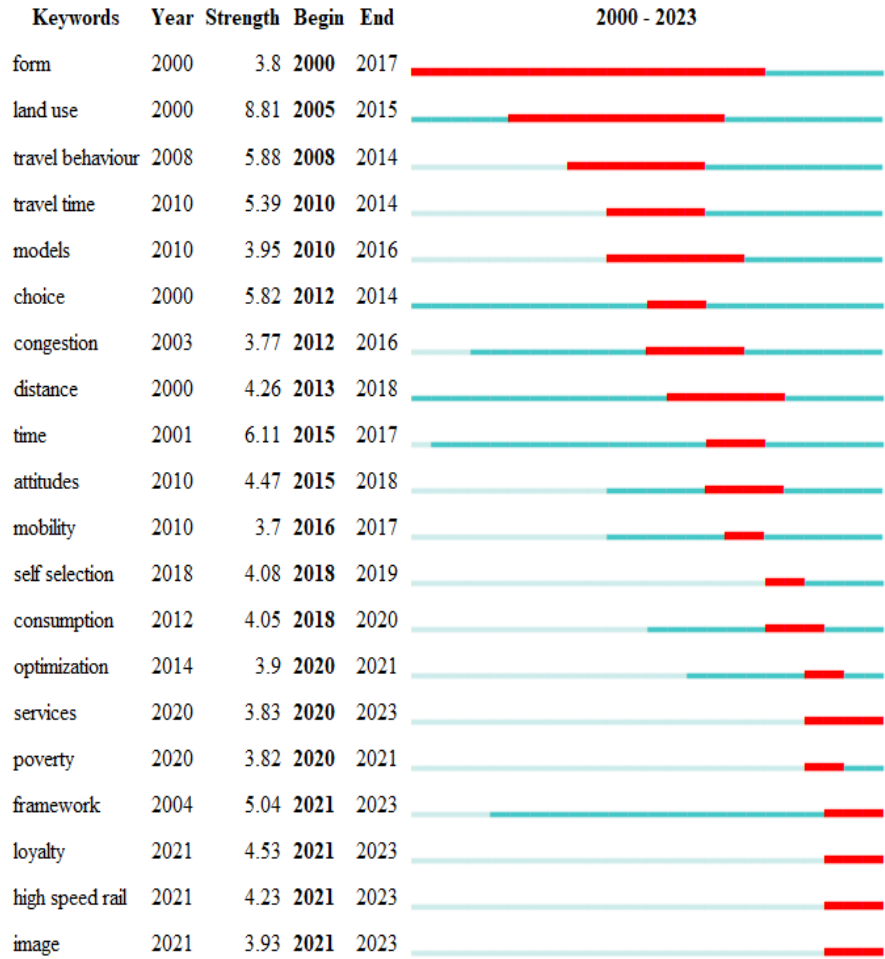


Figure 13. Top 20 Keywords with the Strongest Citation Bursts

Discussions

Theoretical Framework

It is necessary to comprehensively review previous studies and use a vivid, clear, and intuitive figure to show the critical knowledge of the field, which helps scholars understand the structure, status, and evolution of the field easily. *Figure 14* is our knowledge theoretical framework, including statistical, collaboration, co-citation, and co-occurrence analyses. Statistics help us understand the general trend of this field and the popular journals and categories, convincing scholars to publish papers in this field in targeted journals and categories; collaborations provide scholars with suggestions who to cooperate with more effectively based on research interests; co-citations depict the main various topics in this field, letting scholars know the current status of this research field; co-occurrences demonstrate the evolution and progress of this field, and shows potential research direction in the future, which provides scholars with hints about their future research focus.

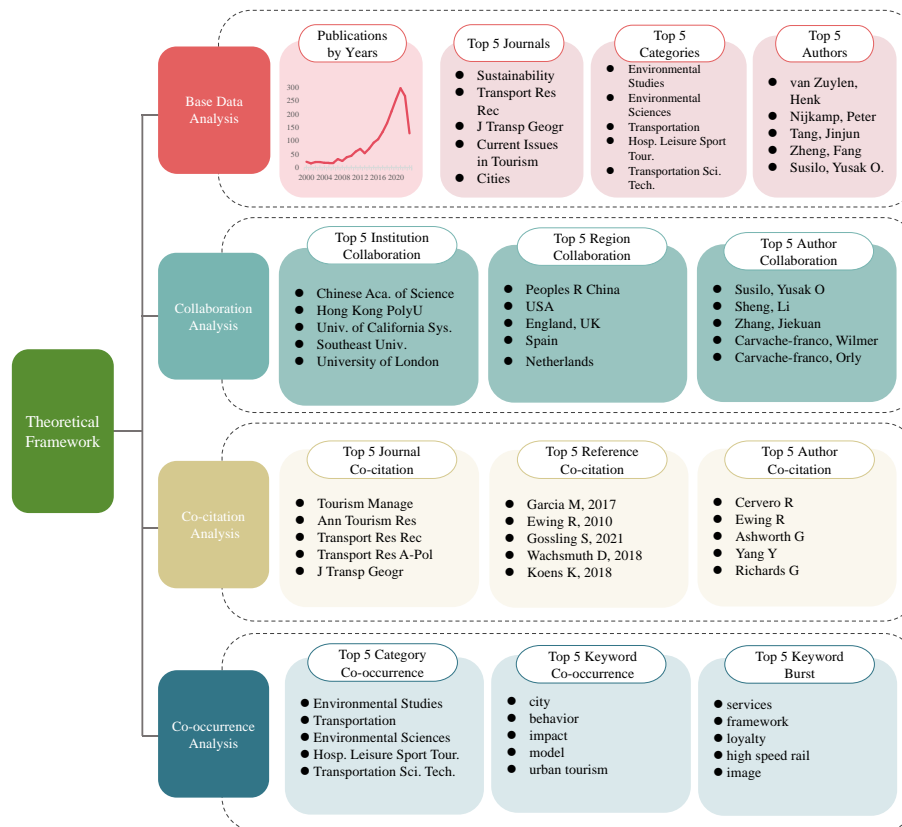


Figure 14. Theoretical Framework of Urban Tourism Research

The details of the theoretical framework we construct are as follows.

(1) Base data analysis is the framework's foundation, showing this field's popularity. Specifically, studies have witnessed fast growth, though there has been a slight decline in recent years (especially after 2021); besides, "Sustainability-Basel," "Transportation Research Record," and "Journal of Transport Geography" are the top journals publishing the most papers in the field; these journals are concentrated in the first quartile, proving that research in this field is relatively competitive as journals publishing more papers in this field are highly recognized; furthermore, categories of environment, transportation, and hospitality cover more papers. Such information encourages scholars to enhance paper quality and submit papers to corresponding categories and journals.

(2) Collaboration analysis depicts correlation status and provides hints to seek potential collaborators. First, regarding institutions, three of the top five collaborating institutions are from China (Chinese Academy of Sciences, Hong Kong Polytechnic University, Southeast University - China), one from the UK (University of London), and the other from the USA (the University of California System). That indicates that some institutions in China, the UK, and the USA are more active in collaboration; secondly, regarding regions, China, the USA, and the UK cooperate frequently with significant influence; thirdly, regarding collaborative authors, Yusak O Susilo, Li Sheng, Jiekuan Zhang, Wilmer Carvache-franco, and Orly Carvache-franco are more active. Scholars may know whom to cooperate with in the future.

(3) Co-citation analysis depicts the current research state. The top co-cited journals are "Tourism Management," "Annals of Tourism Research," and "Transportation Research

Record," indicating that the highly focused topics in this field include management and transportation; the top co-cited references are Garcia-Hernandez (2017), Ewing (2010) and Gossling (2021), covering various topics in urban tourism such as urban planning, tourist movement, and tour destination construction; the top co-cited authors are Cervero R, Ewing R, and Ashworth G, discussing correlations between urban tourism and other factors, and countermeasures to solve urban tourism problems.

(4) Co-occurrence analysis discusses the hot spots and predicts future research topics. From the category co-occurrence, we can see that environment and transportation are most emphasized by scholars, which is also proved by statistical results; from the keyword co-occurrence, we can see that "city," "behavior," and "impact" are the most emphasized keywords; from the keyword bursts, "loyalty," "high-speed rail," and "image" may be the future hot research topics. Past studies emphasize tourists' emotions and behaviors, and later studies emphasize various niche topics in this field.

Future Research Characteristics

Based on the above analysis and the theoretical framework, we propose future research characteristics to provide insights for scholars to continue research more efficiently and effectively.

(1) We should be optimistic that the number of publications will increase. The impact of COVID-19 is declining, and more countries are welcoming visitors, so urban tourism practice will flourish again, increasing urban tourism research; besides, because there will be better urban tourism facilities (such as transportation, road networks, and mobile communications), cultural relics protection, resident support and movement, and public service, urban tourism practice and research in the future will be flourished.

(2) Future research will continue to focus on travel issues. It has been a hot topic in the past decades and will still be in the future. Travel issues will integrate new technologies, such as data mining and GPS sensing, to evaluate travelers' traveling modes and choices. Besides, future research may explore improving the transportation comfortableness of vehicles, such as electric vehicles, paratransit, rail transit, and public transport. In addition, future research may explore how to construct modern transportation networks to decrease traffic jams and commuting time.

(3) Future research will focus on the coordinated interaction mechanism between urban tourism and other factors. Future studies may explore how urban tourism interacts with city development, environment protection, building environment, gentrification, local economy, traveler mobility, city relics protection, and tourist preferences. It is worth noting that such interactions are mutual and complicated; for instance, urban tourism makes local public transportation profitable while making possible traffic congestions; better traffic conditions provide convenience to urban tourism while making more cars on the road and city residents' traveling decisions more complicated.

(4) Future research will still be people-oriented with more complicated approaches and comprehensive perspectives. For instance, "people" will be travelers and citizens; tourist experience and loyalty will be highly focused, and residents' attitudes and support will be emerging topics. Besides, new frameworks and approaches will be used to explore people's urban tourism behaviors, such as the media message's semantic analysis approach and the network-motivated approach. Furthermore, tour destinations will be discussed about how to improve service quality and destination image with targeted and differentiated policies and countermeasures such as virtual reality and artificial intelligence.

In summary, the future research characteristics indicate diversified development of this field, allowing scholars to expand their knowledge and seek new multidisciplinary interests in future research.

Conclusions

This study uses CiteSpace software to analyze publications on urban tourism in SCI, SSCI, and AHCI. We proceed with statistics, collaboration, co-citation, and co-occurrence analysis with visualized clusters and reveal the current state, evolvement, hot topics, and possible trends, which helps scholars comprehensively understand this field.

The key conclusions are as follows.

(1) From a base data perspective, urban tourism is receiving greater attention as the number of publications increases, though there has been a slight decline in recent years. Besides, "Sustainability-Basel" is dominating in publishing papers in this field. Furthermore, this field covers various disciplines such as environment, transportation, science and engineering, and social sciences.

(2) From the collaboration perspective, the most active Asian institutions are mostly Chinese institutions. Besides, the top three collaborative regions (China, the USA, and England of the UK) have different advantages in collaboration. In addition, notable collaborators have various collaboration topics, showing the research diversity of this field.

(3) From the co-citation perspective, the most co-cited journal is not the most influential in this field. Besides, papers in the journals "Tourism Management," "Environment and Planning A," and "Sustainability-Basel" are more likely to be highly co-cited in this field. Furthermore, some co-cited authors use limited papers to get more influence; Hall CM is a typical example.

(4) From the co-occurrence perspective, the top co-occurring and publication categories are the same (environment, transportation, and hospitality), proving their popularity in this field. Besides, tourist behavior deserves attention. Furthermore, tour destination service and image, tourist loyalty, and research frameworks may be future hot topics.

(5) In the future, we should be optimistic that the number of publications will increase. Future research will continue to focus on travel issues, the coordinated interaction mechanism between urban tourism and other factors, and still be people-oriented with more complicated approaches and comprehensive perspectives.

The novelties of this study are as follows. (1) We comprehensively and dynamically summarize urban tourism research with visualized results, which fills previous gaps that focus on certain specific detailed topics statically and textually; (2) we construct a theoretical framework, which provides valuable references for scholars to understand the structure of this field intuitively; (3) we pinpoint the future research characteristics and hotspots, which effectively guide scholars continue research in this field efficiently.

This study has several limitations. (1) We select data only from SCIE, SSCI, and AHCI in WoS and exclude some databases that may influence the analysis results. (2) The study data ended on August 1, 2023; the latest publications may influence the analysis results. (3) Literature was selected only in English, while literature in other languages may also be helpful for the study.

In future research, we will expand the database, update the latest literature, and include documents in other languages.

Conflict of Interest. The authors declare no conflict of interest.

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