Strategic Planning of “Community Campus”
– Case Study of Campus Planning
for Changchun Automobile Industry Institute, China

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Abstract

Universities are urban component and they should never be separated from cities. An open and interactive relationship is needed in modern times between universities and cities.

To improve such relationship and provide some experience for similar cases later, this thesis takes the project of campus planning for Changchun Automobile Industry Institute, China for further research. Established in a step-by-step way, first the introductive part gives detailed information about the origin, development, organization and classification of university and its campus. Then the research problem is put forward and theoretical framework is built up based on three background theories and methodologies: Town and Gown – relationship between universities and surroundings; The Oregon Model – an attempt to apply architectural pattern language and social power to the plan for The University of Oregon; Transit-Oriented Development – efficient way to connect traffic node with city center for sustainability. After that comes the case study of campus planning for Changchun Automobile Industry Institute, with a thorough introduction and a detailed analysis of the project. Six planning strategies about the concept of “Community Campus” are concluded in the end covering three parts – main architectures, road system and landscape, they are: Community fabric; TOD node; Organic order; Nature reserve; Step-by-step development; Public involvement. Finally, this thesis summarizes and evaluates the outcome and its significance, followed by possible recommendations for future research on this topic.

Key words: Campus planning; Strategic planning; Community Campus; Changchun Automobile Industry Institute, China.
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1 Introduction

1.1 University and Campus

As the concentration of human culture and spirit, universities have been taking the responsibility of cultivating, re-constituting and inheriting human intelligence. The word university is derived from the Latin universitas magistrorum et scholarium, roughly meaning “community of teachers and scholars.” (Chisholm, 1911) Depending on this form of group intelligence, the essence of human civilization could be continuously refined and handed down through generations.

It is extremely hard to specify the earliest university in the world, because of different sub-cultures, living habits, and the ways to define a “university”. Usually a university is an institution of higher education and research, which grants academic degrees in a variety of subjects. It normally provides both undergraduate education and postgraduate education (Wikipedia University, 2009a). In order to put more attention to the research problem and reduce unnecessary disputes, this thesis will mainly cite and discuss the universities that have given brilliant importance in the world.

1.1.1 Chronicle of university development

According to Carl-Gustaf Andrén, the long development of university could be divided into five periods (Larsson, 2008a). The first period dates back to 385 BC in ancient Greece, when Plato started a school of philosophy in the name of a grove inaugurated in honor of Akademos. Plato’s Academy was one of the first learned schools and became the prototype and model of similar schools until 11th and 12th century (Figure 1). The aim of the school was to cover all disciplines such as arts, humanities and natural sciences and provide them linkages among each other. It also accentuated the importance between knowledge and society. Young people should be well educated to fulfill the further task of governing and reforming their society.

The second period started in the 11th and 12th centuries and a new type of institutions and organizations for science and higher education were created during that time. University of Bologna, set up in 1088, was considered the first formal university in Europe. It contained different faculties and student nations as what we have today. Since Cathedral schools were erected after 824, the relationships among the university, the church and the city became more and more close. Knowledge, belief and life were intertwined while they still kept certain independent power on their own.

Figure 1. The School of Athens
During the 17th and 18th centuries, sciences especially natural sciences made a breakthrough in people's world view and a new form of scientific society, academy, grew up as complements to the universities. In this period, the importance between knowledge and surrounding society was again, even more emphasized. Students were encouraged to search for new knowledge and the results should be developed to serve and improve the society where they came from.

The 19th and first half of 20th centuries put up new opportunities to universities. Under the inspiration of Wilhelm von Humboldt, founder of Berlin Humboldt University, professors and students of universities were endeavoring to pursue “real truth”, thus modern research especially in natural sciences, medicine and technology was prosperous and industrialization process was propelled consequently. Many universities began to offer lectures to outside people and the boundary between “town and gown” was gradually blurred.

After the end of the second world war in 1945, global cooperation and investment made cross-border expansion and development of research and higher education realized all over the world. Economy incentive, technology support and civilization refinement, the incredible potential of knowledge to surrounding society has been admitted to every government and the increasing need of higher education will remain not only for the individual but also for the whole society.

1.1.2 Organization

Universities are managed and operated through systematic organizations. During medieval times when universities, churches and cities confronted each other as independent individuals, they already had the characteristics of mini-states. They were set up under the orders of kings or other administrative commissioners; they had academic connections with other universities; they also kept varieties of subtle relationships with surrounding cities or communities; and meanwhile they still followed a relatively independent mechanism of their own, in which the institutional life functioned. Such situation has remained much the same today.

Internal governance

Most universities followed the same pattern of internal governance. They have a board of trustees; the Chancellor; at least one Vice-Chancellor; and deans of various divisions (Wikipedia University, 2009b). Usually the Chancellor is just a nominal title and the Vice-Chancellor has real power to administrate and execute university affairs (Bullock et al, 1968). The board of trustees is constituted by both academic members and non-academic members and has the power to decide policies, control finance and deal with academic issues.

Universities are generally divided into departments, schools or faculties, according to different academic natures of subjects. Faculties are major part for education. Through faculty boards they report all important issues to the Chancellor, the Vice-Chancellor and the board of trustees. As Eric Ashby wrote, “unlike the Civil Service or industry or most other bureaucracies, decisions in universities are not taken at the top and passed down to be implemented. Quite the reverse.
Decisions are taken in departments or colleges and have to be sorted out and resolved at the top.” (Ashby, 1962) (Figure 2)

Figure 2. University Policy Framework-Hierarchy

External governance
There are two types of relationships between universities and governments. Public universities on most part are ruled over by government-run higher education boards and they are responsible for dealing with financial issues, programs changes and future development of higher educational system domestically. Private universities have a broader independence financially and politically. They manly obtain funds and other supports from private organizations and allied institutions.

1.1.3 Categories

The arrangements of universities varied throughout centuries’ development. Since Plato set up his academy outside the city walls of ancient Athens, “where the precincts were enclosed with a wall and a sacred grove of olive trees was dedicated to Athena” (Wikipedia Akademia, 2009), the place for knowledge seemed deliberately keeping a certain distance from its surroundings. The condition reached a culmination later when Cathedral schools were prosperous and the special structure of the monastery – totally enclosed quadrangle became the archetype for later colleges.

College quadrangle
Originally college meant a group of persons living together, under a common set of rules (Wikipedia College, 2009). Usually it appears in the form of quadrangle, a space or courtyard often rectangular (square or oblong) in plan, the sides of which are entirely or mainly occupied by parts of a large building (Wikipedia Quadrangle, 2009). Medieval colleges in Oxford and Cambridge adopted this arrangement, with a central courtyard enclosed by functional space of education, research and accommodation for their members (Figure 3). Thomas Jefferson, in his plan for the University of Virginia in early 19th century, had developed an open-ended quadrangle arrangement of one- and two-story buildings facing each other across a campus green or lawn and potentially extending out into the landscape (Office of the Architect for University of Virginia, 2008a) (Figure 4).

![Figure 3. Mob Quad, Merton College, Oxford](image1)

![Figure 4. Academical Village designed by Thomas Jefferson, University of Virginia](image2)

University town
Following the great strides of natural science, since the 16th and 17th century universities were inclined to be more specialized in specific subjects such as astronomy, anatomy, physics, chemistry and physiology etc. The old enclosed style of college buildings could not satisfy the new requirements of more space and more professional equipment therefore new specialized buildings were started and universities began to spread out over the whole city. A structure of scattered institutions, mixed and thus integrated with the rest of the city was formed like old Swedish university towns Lund and Uppsala (Larsson, 2008b) (Figure 5).
Campus
For political as well as pedagogical reasons, early American colleges rejected or substantially modified the model of college quadrangle; also unlike English colleges, many of them were established outside of urban areas (Office of the Architect for University of Virginia, 2008b). Geographical advantage provided large open space for functional building groups and gradually they together formed the whole university area as a new type of arrangement – campus (Figure 6). The first documented use of the word “campus” is in a letter from a Princeton student in 1774 and the campus type has retained its importance as a specifically American planning tradition (Larsson, 2008c).

Following the clue of how universities developed in their arrangements we could find a very interesting trend: from “college quadrangle” to “university town”, and to “campus”, universities have kept seeking ways to expand themselves not only geographically but also socially. Single unit had kept duplicating themselves to form new building groups combined with surrounding society; when it came to a certain point that physical territory could not sustain the whole, a cleavage would happen therefore a more independent form of autonomy appeared.
1.2 Research Problem

Under the background of globalization today, brilliant achievements are mostly accomplished within intersectional ranges of different disciplines. Therefore the arrangements of universities are inclined to be more organic and open, in order to encourage academic intercommunication and cooperation, as well as social communication between teachers and students.

However, “organic” does not mean “without planning” and “open” does not mean “no boundary”. To avoid such problem there comes another trend – locating universities far away and totally separated as new satellite cities. Several universities can be assigned to share the campus and usually it is called “university-city”. Taking China for example, according to “National Land Use Survey” launched by Ministry of Land and Resources since August 2003, there are altogether 14 provinces out of 34, which have arranged or will arrange “university-city” soon. Within the 14 provinces, most “university-cities” are located in Eastern China and average population of each is at least 10,000 (Shen & Lu, 2004).

Problems appeared gradually after these “university-cites” were put into practical use. Normally they possess giant area from hundreds to thousands of hectares and once the sites are not well integrated with practical uses they will become deserted and dull. La Source Campus, planned and constructed near Orleans France, has an area of 180 hectares for 10,000 students. Architect O.C. Cacoub ambitiously wanted to make it the center of satellite city of “Orleans the Second” by providing meeting places and landscape areas, but due to financial reason as well as segregation from main city, students felt “it is just a humble place for activities but not a center.” (Huang & Li, 2004) (Figure 7)

![Figure 7. La Source Campus, France](image)

We might ask why and how it came to this situation. The reason matters internally and externally. On internal aspect it is concerned with university arrangement such as different functional zones, and on external aspect it reveals the relationship between universities and cities. A well-planned, humanistic and up-to-date campus for a university should achieve on both aspects. Here we come across a concept for such campus which works as a local center meanwhile connected tightly to urban life – “Community Campus”. It will be concluded through relevant background theories and methodologies, and presented by the case study of campus planning for Changchun Automobile Industry Institute, China.
1.3 Theoretical Framework

1.3.1 Town and Gown

The idea of a “Community Campus” model derives from several background theories and methodologies. It is helpful to absorb some essence from existing cases in order to summarize advantages and disadvantages for the model. In the first part of “town and gown”, two of the most important universities with great influence are researched, The University of Oxford in UK and Uppsala University in Sweden. The former is considered “the oldest university in the English-speaking world” (Sager, 2005) (Figure 8) and the latter “founded in 1477, is the oldest university in the Nordic countries.” (Uppsala Universitet History in Brief, 2009) (Figure 9) Through reviewing the histories of both universities, we might dig out some experiences about how to develop universities on the basis of cities and coordinate the two parties. The University of Oxford, set up and expanding in the city of Oxford, now has combined itself very well with surroundings. Uppsala University, although has similar history as The University of Oxford, somehow still has the problem to reach a balance between pure academy and mixed town life. In short, how to coordinate and balance “town” and “gown” today is the crucial point for further case study.
1.3.2 The Oregon Model

The second part of theories comes from a modern planning practice in The University of Oregon in USA during 1970s. It was initialized by a planning team from The Center for Environmental Structure, Berkeley, California, with Christopher Alexander, Murray Silverstein, Shlomo Angel, Sara Ishikawa and Denny Abrams as leading planners, and based on their three famous works – “A Pattern Language”, “The Timeless Way of Building” and “The Oregon Experiment”, aiming at defining “an entirely new kind of planning process which can, with minor modifications, be adopted as a master plan by any community, anywhere in the world.” (Alexander, 1975a) (Figure 10) In this pioneering participatory planning experiment, Christopher Alexander and his team successfully brought up six principles of implementation.

1) The principle of organic order.
2) The principle of participation.
3) The principle of piecemeal growth.
4) The principle of patterns.
5) The principle of diagnosis.
6) The principle of coordination.

These principles will be further consulted and carefully examined according to practical conditions in China such as land-use policy and educational system. Appropriate ones will be utilized in the case directly and others may need partial adjustment and adaptation.

1.3.3 Transit-Oriented Development

The theory of Transit-Oriented Development appeared first in the late 1980’s as one of components of New Urbanism against urban sprawl in the United States. Peter Calthorpe codified the concept of TOD as “a mixed-use community that encourages people to live near transit services and to decrease their dependence on driving.” (Institute of Urban and Regional Development Berkeley, 2009)

A TOD neighborhood typically has a center with a train station, metro station, tram stop or bus stop, surrounded by relatively high-density development with progressively lower-density development spreading outwards from the center. TODs generally are located within a radius of one-quarter to one-half miles (400 to 800 meters) from a transit stop, as this is considered to be an appropriate scale for pedestrians. (Wikipedia Transit-oriented development, 2009a) (Figure 11)
TOD is developed on the basis of sustainability, ecology and humanity. It emphasizes reduction of private cars and energy consumption, thus could potentially improve land-use efficiency and environmental quality. It also puts human scale on the first position such as encouraging pedestrian system and providing mixed functions within a walkable distance, therefore a healthier lifestyle could be realized and a better life quality could be obtained.

Universities can be regarded as communities on the aspects of systematic internal governance, mixed social identities, different functions and physical arrangements. For this reason TOD theory could be also applied to campus planning for universities which have special geographical conditions, for example, located relatively far away from city center. The case of Changchun Automobile Industry Institute is just like this and will be studied further under the hypothesis that TOD would help enhance both internal connections among university components and external connections between universities and cities.

1.4 Methodological Approaches

Main methodological approaches applied to this thesis are: document research; map study; on-site inspection; data analysis and summary. They are employed according to the following sequence (Figure 12).
1.4.1 Document research

After research problem has been clarified, background theories and methodologies will be reviewed thoroughly and related points will be extracted as basis for later case study. This process is called “Document research”, including research on books, papers and online materials.

1.4.2 On-site inspection & Map study

Relevant points extracted from background theories and methodologies will be applied to the planning case for Changchun Automobile Industry Institute. Based on the background information provided by Changchun Urban and Rural Planning and Design Research Institute, the author has investigated the site, taken photos, drawn sketches and studied the base map for further research on next step.

1.4.3 Data analysis & Summary

According to the requirements of the Institute, basic data on construction and administration of different functional groups are analyzed and six planning strategies are summarized covering three parts of the campus – main architectures, road system and landscape. They are presented by sketches in the end of the thesis.

1.5 Summary of Outcome

Most ancient universities developed and expanded from a central core – a college quadrangle
with traditional inward-looking monastic form and independent on finance and administration. Such a harsh boundary between “town and gown” has already been proved unfeasible since medieval times when the Battle of St. Scholastica Day (Wikipedia Town and gown, 2009a) scarified too many innocent lives. Universities should never turn their backs to the cities in which they are embedded. In fact, they are parts of urban components and function as communities on urban scale.

This thesis aims to find out a new method to improve the relationship between universities and cities, and provide some experience for similar cases in the future. Inspired by the same concept of “community” from sociology as “a group of interacting people living in a common location” (Wikipedia Community, 2009), a new concept of “Community Campus” will be summarized through the planning practice for Changchun Automobile Industry Institute, and they will together provide a new vision of adjustment, adaptation and advancement for universities in modern society.

Six planning strategies about the concept of “Community Campus” covering three parts of the campus (main architectures, road system and landscape) are listed as below:

– Community fabric.
– TOD node.
– Organic order.
– Nature reserve.
– Step-by-step development.
– Public involvement.

### 1.6 Organization of the Thesis

This thesis is carried out in a step-by-step way. In the beginning there is the chapter of introduction, which explains the origin, development, organization and classification of university and its campus. Then the research problem is put forward and a theoretical framework is set up. Through the methodological approach of “Document research”, relevant background theories and methodologies are introduced as planning foundation. Three important items are: Town and Gown – relationship between universities and surroundings; The Oregon Model – an attempt to apply architectural pattern language and social power to the plan for The University of Oregon; Transit-Oriented Development – efficient way to connect traffic node with city center for sustainability. The three parts are reviewed and explained thoroughly in the second chapter of this thesis.

The third chapter mainly focuses on the case study of campus planning for Changchun Automobile Industry Institute. It is based on the methodological approaches of “On-site inspection” and “Map study”. A thorough introduction and a detailed analysis of the project are implemented in this part, combined with the relevant points extracted from background theories and methodologies. Then the new concept of “Community Campus” and six planning strategies covering three parts – main architectures, road system and landscape, are concluded via the methodological approach of “Data analysis”, they are: Community fabric; TOD node; Organic
order; Nature reserve; Step-by-step development; Public involvement. In the end of this thesis, the outcome and its significance are summarized and assessed, followed by possible recommendations about future study on this topic.
2 Background Theories and Methodologies

2.1 Town and Gown

“Town and Gown” is a historical word originated in medieval times. Literally they stand for two different communities of a university town/city like Oxford and Cambridge. “Town” is used for the non-academic population while “gown” for the university community (Wikipedia Town and gown, 2009b) (Figure 13). The gown is an academic long black dress with hood and cap for students in universities. Its practical use of keeping warmth and social symbol of distinguishing students from town people has set apart the two groups and brought about series of side-effects such as social segregation even conflict by violence. One of the most famous was the Battle of St. Scholarstica Day, occurred on February 10th, 1355 at the University of Oxford. It lasted for two days with a sacrifice of several scholars attacked by armed local citizens.

The situation was not much better in America. Yale University, located in New Haven, Connecticut, was chartered in 1701 to educate youth for “public employment both in Church and Civil State.” It began from one building in downtown area of New Haven, based on a “Nine-Square Plan”. Along with its gradual expansion and over autonomy, the relationship between Yale University and New Haven also became strained (Office of Facilities, University Planning, Yale University, 2000) (Figure 14). A series of violent confrontations between students and townsfolk happened for a long time in New Haven. As a result, the relationship between town and gown has remained ambivalent and unproductive over the centuries. Kysiak described such situation as “although universities bring great prestige to a community, many citizens perceive them solely as large, powerful, non-taxpaying entities that soak up city services and provide little in return. This perception, combined with the universities’ penchant for making unilateral decisions without city consultation, made the relationship between the two entities more and more acerbic as time went on.” (Kysiak, 1986)
Universities and surrounding communities should never be hostile towards each other because they are two inseparable components of the whole urban environment. While universities focus on the cultural life for cities, the latter provides essential accommodation for the former. The two parties should keep their own identities while permitting intercommunication and cooperation. Through the following two cases of old universities towns/cities, we shall analyze the phenomenon of symbiosis between universities and cities and how it works.

2.1.1 The University of Oxford

The University of Oxford, located in the City of Oxford, Oxfordshire, Great Britain, is the oldest university in the English-speaking world (Figure 15). There is no clear date of foundation, but teaching existed at Oxford in some form in 1096 and developed rapidly from 1167, when Henry II banned English students from attending the University of Paris. In the 13th century, rioting between town and gown hastened the establishment of primitive halls of residence. Less than a century later, Oxford had achieved eminence above every other seat of learning, and won the praises of popes, kings and sages by virtue of its antiquity, curriculum, doctrine and privileges. The University also contributed to social equality on gender issues. Women were admitted to full membership of the University in 1920 and until 2008, all of Oxford’s 38 colleges began to admit both women and men. The University has enhanced and strengthened its traditional role as an international focus for learning and a forum for intellectual debate. It will keep the leading role in contribution to learning (University of Oxford A brief history of the University, 2009) (Figure 16).
Centuries’ intertwining between the University and the city has made Oxford famous as the “city of dreaming spires”, a term coined by poet Matthew Arnold in reference to the harmonious architecture of Oxford’s university buildings (Wikipedia Oxford, 2009a). For the reason of early foundation, the University could take the opportunity of developing together with the city and combining itself closely into urban structure. The center of Oxford, radiated from the junction of the High Street and St Aldates, is most often famous for old architecture groups from the University and colleges. 46 colleges and halls spread along the north-south axis and 60
departments are distributed all over the city (Figure 17). The University also provides lots of highlight places such as museums, libraries and churches not only for local citizens but also for tourists. For example, The Botanic Garden is the oldest botanic garden in the UK, and the third-oldest scientific garden in the world. It contains representatives from over 90% of the world’s higher plant families (Wikipedia Oxford University, 2009).

Although suffered from the confrontation of “town and gown” before, the University and the city of Oxford have realized the importance of integration and cooperation. The University now has more than 20,000 students including 11,734 undergraduates and 8,101 postgraduates taken an essential position within the city (University of Oxford Facts and Figures, 2009). The large population of students counts almost 15% of the total population of the city of Oxford, which are 151,000 within the district urban boundary (Wikipedia Oxford, 2009b). It has given the city a dynamic, open and cosmopolitan atmosphere besides the historical heritage from medieval times, meanwhile routine lives of local citizens have been also diversified and delighted with the participation of young generation. For instance, The Oxford Sports Council holds a joint annual competition in many sports called “Town vs. Gown”, in conjunction with Oxford University Sports Federation for over a hundred years and it is very popular among both groups (Oxford University Sport Town vs Gown, 2009). There is also a scheme, entitled “Transform Oxford” for urban redevelopment and issued by the city council, which aims to redesign the center of Oxford to “pedestrianise” the city (Oxfordshire Our plans for Oxford, 2009). By this means both students and local citizens would enjoy cycling and promenading in the historical area of central Oxford and a safer environment will be created.

2.1.2 Uppsala University

As the third largest city in Sweden, located 65 kilometers north of Stockholm, Uppsala is famous for both historical and cultural values. It fertilized Uppsala University since 1477 as the oldest university in the Nordic countries. Later at the end of 16th century, Uppsala University experienced its rebirth and was given a relative financial stability with the large donation of King Gustavus Adolphus in the early 17th century (Wikipedia Uppsala University, 2009a). From then on the University really became a research place covering four traditional faculties of Theology, Law, Medicine and Philosophy. There were a lot of brilliant breakthrough and contribution produced at the University in the 18th century and the fame of Uppsala University, as well as the identity of Uppsala as a university city were well consolidated. Although the industrial revolution also took place in the late 19th century in Uppsala, the whole city was not influenced so much. The most obvious change occurred on the layout of urban functions: most factories were located on the left bank of the River Ryris while most houses built in stone on the right, together with the Castle and the Cathedral as the state symbols (Larsson, 2008d) (Figure 18). At that time, many imposing university buildings were also constructed and located in the western part of the city, which contributes to emphasize the identity of Uppsala’s historic centre (Figure 19).
Since the latest reorganization in 1999, the University now has nine faculties instead of the traditional four faculties. They are: the Faculty of Arts, the Faculty of Social Sciences, the Faculty of Languages, the Faculty of Theology, the Faculty of Law, the Faculty of Medicine, the Faculty of Pharmacy, the Faculty of Science and Technology and the Faculty of Educational Sciences. There are about 20,000 students, 2,000 doctoral students and a teaching staff of 4,000 (part-time and full-time) out of a total of 6,000 employees in the University today (Wikipedia Uppsala University, 2009b). Besides providing world-class research and education and preserving tradition and culture, Uppsala University also play an active role in surrounding society, promoting growth and innovation. In the last ten years some one hundred new companies have been created to develop research breakthroughs (Uppsala Universitet Uppsala University since 1477, 2009) (Figure 20).

The University and the city of Uppsala have lived and developed together for long. Since the 1990s, the University has been more actively recognized as strategic partners by the municipality, as well as the city and the region of Uppsala (Larsson, 2008e). To enhance the value of the city and stimulate economic expansion of the region, the most crucial problem is how to attract and settle down more well educated people in Uppsala. It is not sufficient to only rely on old historic center and student traditions. A varied demographical constitution and diversified urban life style should also be considered, as the instability of students is a big hindrance to commercialization within the city. Therefore, to combine the cultural part with the commercial part and to obtain the best balance between the two is the key for the relationship between universities and cities.
2.2 The Oregon Model

Emerging in the late 19th century, Modernism gradually gained popularity after the Second World War and became dominant in architectural style in the 1960s. It emphasized new material, new technique and new appearance of architecture, in order to get rid of hindrance from traditional styles. However, as it kept creating dull massive buildings which could not well integrate themselves with surroundings, people started to feel bored even against it. In the late 1960s and early 1970s, students and faculty at the University of Oregon, in Eugene, Oregon, United States, began to protest such brutal and dystopian architectural style through campus and they wanted to have the environment of their own. The University administration finally decided to launch a new planning process through which the campus community could participate and help create its own space (Wikipedia The Oregon Experiment, 2009).

Based on community design, Christopher Alexander, from The Center for Environmental Structure, Berkeley, California, with his planning team (including mainly Murray Silverstein, Shlomo Angel, Sara Ishikawa and Denny Abrams) started an unprecedented planning process for the University of Oregon in 1974. This process was supposed to “allow people under the half-ideal conditions of the centralized budget, to take care of the environment for themselves, and have some measure of control over their own lives.” (Alexander, 1975b) The highlight of this experiment was six principles as below.

2.2.1 The principle of organic order

“Planning and construction will be guided by a process which allows the whole to emerge gradually from local acts.” – The Oregon Experiment

The University of Oregon was established on October 12th, 1876, by The Oregon State Legislature. It is organized into eight schools and colleges and has a population of 22,060 including 20,394 students and 1,666 staff (Wikipedia The University of Oregon, 2009). The campus was first planned by Ellis F. Lawrence in 1914. The concepts Lawrence employed include high-quality, humanly scaled, and carefully detailed buildings arranged around a system of open spaces interconnected by pathways. These concepts are the basis for further campus development (University of Oregon Planning Office, 2005). Since then the plan has been revised for several times, but the fundamental characteristics have been inherited and represented very well.

The planning team gives definition of “organic order” as “the kind of order what is achieved when there is a perfect balance between the needs of the parts, and the needs of the whole” (Alexander, 1975c). To them, the University of Oregon doesn’t have to make a perfect master plan because it would be a limitation for incremental necessary development in the future. Master plan can create a totality with totalitarian order, but not a whole with organic order. As an organism, the campus will gradually obtain the most adaptive form by numerous times of growing, reparation or even regeneration. An abrupt and rigid framework meant to solve the basic problem for the campus would only create an entirely new set of other problem.
As a solution, the planning team suggests that any traditional physical master plan should be replaced by the process which could enable all community to join and express their needs and ideas. A planning board should be set up on behalf of the community, with less than 10 members (equal in users and administrators). A director of planning constituted by professionals is also in need to guide the action.

2.2.2 The principle of participation

“All decisions about what to build, and how to build it, will be in the hands of the users.” – The Oregon Experiment

The planning team also emphasizes the importance of users – the students, faculty and staff in the University, because they know exactly what they need and how the environment functions around them. “Participation” means to join in, to work with and to share the achievement. Therefore the planning team proposes a new process in which users could effectively express their needs to architects, then architects help implement users’ idea, but not exert their own thoughts on users.

There are two aspects of involvement in such participation: creative control and ownership (Alexander, 1975d). The former is based on the latter. First users must be entitled certain rights to the environment where they live and work. It would enhance their responsibility and promote their further incentives to improve the environment. Then they would voluntarily join in the activity in which they could express their ideas freely even realize their needs by themselves. Such a participative process would generate a virtuous circle for the planning and eventually a democratic, human-scaled, site-specific environment will be created.

2.2.3 The principle of piecemeal growth

“The construction undertake in each budgetary period will be weighed overwhelmingly towards small projects.” – The Oregon Experiment

As mentioned before, an organism grows and develops in a gradual way. The process of growth and reparation happens piece by piece and takes a long time to accomplish. However it would reach the best balance eventually as “survival of the fittest”. The same reason here for environmental construction. After industrial revolution many large body mass were built hastily and meaninglessly. People were controlled by the massive existence of time and space, but forgot to think over the relationship between the buildings and themselves.

To avoid such waste in money and life, the planning team provides a new way to build and develop the environment – piecemeal growth. To them, “Large lump development hinges on a view of the environment which is static and discontinuous; piecemeal growth hinges on a view of the environment which is dynamic and continuous.” (Alexander, 1975e) Through lots of investigation they summarize the relationship between building size and cost. The result shows
obviously that the cost will increase quickly when the height and/or the area of building goes up. It supplies low-budget projects with very effective support and encourages economic construction.

2.2.4 The principle of patterns

“All design and construction will be guided by a collection of communally adopted planning principles called patterns.” – The Oregon Experiment

A pattern comes from agreement of all users. It refers to “any general planning principle, which states a clear problem that may occur repeatedly in the environment, states the range of contexts in which this problem will occur, and gives the general features required by all buildings or plans which solve this problem.” (Alexander, 1975f) The planning team has summarized and listed 253 patterns of different scales, from towns and neighborhoods planning to the detailed design for houses, gardens and rooms, in their earlier book “A Pattern Language”. They try to provide an easier way for people to plan and build their own environment by using these patterns. The normal procedure is: Going through all the patterns on the list; picking the ones that best fit the project; then reading them in detail and keeping adding up new items until user’s own list is full; completing the list by possible exchanges, corrections and improvements; building the environment according to these patterns in order to fulfill users’ needs.

The planning team then picks 37 general patterns that deal with problems of density, buildings, open space, roads and paths and 18 special patterns that are peculiar to universities problems, to form a complete list with 55 patterns that best fits the environment of the University of Oregon. They are listed as following:

General patterns
Local transport area; Network of leaning; Identifiable neighborhood; Four story limit; Access to water; Mini buses; Promenade; Activity nodes; Looped local roads; T junctions; Path network; Road crossing; Quiet backs; Accessible green; Small public squares; Degrees of publicness; Local sports; Small parking lots; Shielded parking; Paths and goals; Bike paths and racks; Path shape; Pedestrian density; Public outdoor room; Office connections; Number of stories; Building complex; Site repair; Tree places; South facing outdoors; Connected buildings; Main gateways; Main entrance; Family of entrances; Wings of light; Positive outdoor space; Arcades (Alexander, 1975g).

Special patterns
University population; Open university; Student housing distribution; University shape and diameter; University streets; Living learning circle; Fabric of departments; Departments of 400; Department space; Local administration; Student community; Small student unions; Parking spaces; Classroom distribution; Faculty student mix; Student workplace; Real learning in cafes; Department hearth (Alexander, 1975h).
2.2.5 The principle of diagnosis

“The well being of the whole will be protected by an annual diagnosis which explains, in detail, which spaces are alive and which ones dead, at any given moment in the history of the community.” – The Oregon Experiment

Any abnormal growth of an organism could be detected and sensed then effectively dealt with. This is the process of “diagnosis” – a self-sense-and-repair and gradual method that could either eliminate or correct the drawbacks during the whole growth. It is also applicable to a planning, helping maintain the sequence of the whole and achieve the organic order. The planning team suggests that an annual diagnosis should be accomplished by planners and users together, in order to specify mistakes and insufficiencies and repair and improve them in time.

A diagnosis example is given to check the pattern of “Positive outdoor space” in the campus of the University (Figure 21). A check map is finished with four colors: yellow, orange, red and red hatching indicating different level of correspondence to the pattern (Alexander, 1975i). Yellow means fully existence of the pattern; orange means some repair needs to be added to fulfill the pattern; red area needs radical repair because they are unusable; and red hatching indicates no existence of the patter at all. Such diagnosis will help users and planners to go through the whole project to discover and repair the defects. It is also a driving force to promote participation and organic order.

2.2.6 The principle of coordination

“Finally, the slow emergence of organic order in the whole will be assured by a funding process which regulates the stream of individual projects put forward by users.” – The Oregon Experiment

Coordination is the last principle from the planning team. It means the act that makes different stakeholders work together for a common goal. In a planning case, the financial support usually comes from the central government to make sure the project would contribute most to the users. The separation among finance, technology and customers will result in a series of problems if the three aspects cannot be well coordinated.

The planning team therefore gives the solution of coordination, using “a funding process which regulates the stream of individual projects put forward by users.” (Alexander, 1975j) They suggests that each project proposed by users should be submitted in a formal way to the planning board; then they will be put in order of priority to be subsidized, according to users’ needs; they will be also judged to see if they will comply with the other five principles. By this means, money, time and need could be well balanced and the environment will be built under the wish of all
stakeholders.

2.3 Transit-Oriented Development

Most modern universities have been included in the plan of urban development and not isolated as in medieval times any more. Therefore the physical linkage between urban environment and universities – transportation system, needs to be studied as well. A well planned and developed transportation system could open the enclosed ivory tower to the society and help realize exchanges of information and material between the two, consequently could do good to improve the relationship between universities and cities.

Among numerous trends of transportation planning, Transit-Oriented Development (TOD) is a new one appeared during the 1990s. It emphasizes mixed land-use and public transport and encourages a compact, integrated development which is different from urban sprawl. Pedestrian network and bicycle paths are considered first and amounts of parking for private vehicles are reduced from the angle of humanity. To universities, the conditions of compact and mixed land-use as well as slow traffic mode are extremely suitable for the application of Transit-Oriented Development.

2.3.1 The origin

Transit-Oriented Development is a new paradigm of development for urban and suburban areas within a city, a region or a large metropolitan conurbation. Under the context of disorderly urban sprawl in the United States after World War II, serious problems such as land devaluation, traffic congestion and environmental deterioration gradually became worse and it was urgent to carry out some effective solution against them. In the beginning of the 1990s, American architect and urbanist Peter Calthorpe proposed the concept of Transit-Oriented Development (TOD), by combining the notion of the pedestrian pocket with the idea of planning development around transit stations. In his book “The Next American Metropolis” (Figure 22), Calthorpe emphasized mixed-use development and density around transit, and associated urban design principles with TOD (Dittmar & Ohland, 2004).

1) Organize growth on a regional level to be compact and transit-supportive.
2) Place commercial, housing, jobs, parks, and civic uses within walking distance of transit stops.
3) Create pedestrian-friendly street networks that directly connect local destinations.
4) Provide a mix of housing types, densities, and costs.
5) Preserve sensitive habitat, riparian zones, and high-quality open space.
6) Make public spaces the focus of building orientation and neighborhood activity.
7) Encourage infill and redevelopment along transit corridors within existing neighborhoods.


2.3.2 TOD in urban design

When applying TOD theory to urban planning and design, a typical TOD neighborhood has a center with a train station, metro station, tram stop, or bus stop, surrounded by relatively high-density development with progressively lower-density development spreading outwards from the center (Wikipedia Transit-oriented development, 2009b). Furthermore, it is usually located within a radius of 400 to 800m from the center of a transit stop to make sure that pedestrian environment is reasonable and comfortable.

Fundamental components of Transit-Oriented design can be concluded as following (Transit Oriented Development, 2009):
1) Walkable design with pedestrian as the highest priority.
2) Train station as prominent feature of town center.
3) A regional node containing a mixture of uses in close proximity including office, residential, retail, and civic uses.
4) High density, high-quality development within 10-minute walk circle surrounding train station.
5) Collector support transit systems including trolleys, streetcars, light rail, and buses, etc.
6) Designed to include the easy use of bicycles, scooters, and rollerblades as daily support transportation systems.
7) Reduced and managed parking inside 10-minute walk circle around town center/train station.

2.3.3 Successful practices

Arlington County, Virginia, USA.

Arlington County is located directly across the Potomac River to the southwest of Washington, D.C. and has about 209,300 residents. Its land area is 67 km$^2$ and density is 3,087/km$^2$, ranking the smallest self-governing county in the United States. In 2002 Arlington County won award for overall excellence in smart growth by the United States Environmental Protection Agency (Wikipedia Arlington County, 2009a) (Figure 23).

Figure 23. Map of Virginia highlighting Arlington County

Arlington County’s success comes from the development policy of local government. This policy regulates that new development should be located near transit facilities, such as Metrorail stations.
and the high-volume bus lines of Columbia Pike. Mixed land-use, pedestrianization and Transit-Oriented Development are strongly encouraged within the transit areas. Much of Arlington's development has been concentrated around 7 of the County's 11 Metrorail stations and the development outside these areas has been limited but with exceptions of some large projects close to major highways such as the Shirley Highway.

The government has also emphasized public involvement and collaboration during the practice. The public can get necessary information about TOD and all stakeholders have rights to participate in county planning initiatives and the site plan review process for new development. Therefore a harmonious and balanced environment for both developers and the community has been created in the County.

There are 5 high-density cores in Arlington County: Rosslyn, Courthouse, Ballston, Pentagon City and Crystal City. Obviously they are also major Metrorail stations. Rosslyn, Courthouse, and Ballston are accessible on Metro's Orange Line from east to west; Rosslyn, Pentagon City, and Crystal City are accessible on the Blue Line from north to south, with Pentagon City and Crystal City also utilizing the Yellow Line (Wikipedia Arlington County, 2009b). These interconnections have shaped several transit linkages and improved TOD mode from single node to compound corridor (Figure 24, 25).

Figure 24-1. Location of Rosslyn-Ballston corridor

Figure 24-2. Layout of transit stations in Rosslyn-Ballston corridor
Copenhagen, Denmark

As the capital and largest city of Denmark, situated on the Islands of Zealand and Amager, Copenhagen has an urban area with a population of 1,167,569 and a metropolitan area with population of 1,875,179 (Wikipedia Copenhagen, 2009) (Figure 26, 27). Over the years massive investments have been put into urban facilities and infrastructure, and the new wave of architecture and urban design has shaped Copenhagen into a major regional center with strong urban development.

In 1947, the municipality initiated a plan to develop Copenhagen in a finger pattern. According to the plan, suburban Copenhagen is divided into five fingers with an extra one (Wikipedia Finger Plan, 2009) (Figure 28). The northern suburbs, with mixture of garden cities, mansions, larger and mid-size houses, form the little finger of the plan. The north-northwestern part of the suburbs, mainly for middle-class dwellings and some upper-class areas, form the ring finger. The northwestern suburbs form the middle finger. It consists of a mixed area of detached middle-class dwellings, widespread garden cities and large, low-rise public housing projects, as well as part of the industrial areas. The western suburbs form the index finger, mainly with low housing projects. The southwest suburbs along the coast form the thumb of the plan, with dominantly high-rise housing projects and some detached middle-class houses. The extra finger
means Amager island suburbs and Malmö, Sweden. This area gradually becomes the most modern place since domestic infrastructure has been much improved and Oresund Bridge has connected to Sweden.

Based on the finger plan, Copenhagen establishes its public transportation system consisting of commuter trains, buses and metro. The commuter trains form the basis of the transportation network, stretching to most areas of metropolitan Copenhagen with the main hub at Copenhagen Central Station (Figure 29). Taking public transport nodes as the center, pedestrian network and bicycle paths spread out within the diameter of 1.5 km, and buses are much more encouraged than private cars when the diameter grows. Meanwhile land-use development is related tightly with the transportation system, with the 1993 urban plan requiring new development projects should be located concentratively within the distance of 1 km from public transport nodes, and mixed functions such as residential and commercial buildings especially public facilities should be considered with priority (Cervero, 1998).
3 Strategic Planning of “Community Campus”

3.1 Significance of the Project

Based on previous analysis, the planning of “Community Campus” will be carried out at Changchun Automobile Industry Institute, China. It is a domestic professional college belonging to China First Automotive Group Corporation. The old campus of Changchun Automobile Industry Institute was set up in 1979 and located in Changchun Automotive Industries Development Area, southwest of the city. It has a total area of 340,000 m$^2$ with the construction area of 234,000 m$^2$; and more than 6,000 students, 463 full-time staff and around 200 part-time teachers from the enterprise (Changchun Automobile Industry Institute, 2009a) (Figure 30, 31).

According to the agreement between China First Automotive Group Corporation and the municipal government, future development of Changchun Automobile Industry Institute will be supervised and administrated by both parties together (Board of Directors CAII, 2008). The joint cooperation is a big common advantage for all stakeholders. First, it can provide the Institute with preferential policy on professional education and land utilization from local government. Second, it can satisfy the demands of strategic development of China First Automotive Group Corporation and regional economy growth of Changchun. Last, it helps create a new model for enterprise-government jointed administration on professional education, and set up a constructive example for similar cases in the future.

3.1.1 Educational aspect

As one of the earliest national models of professional colleges, Changchun Automobile Industry
Institute became the first college of “Project 211”\(^\text{[1]}\) in Jilin Province. So far there are 20 majors set up by the Institute in the departments of Automotive Engineering, Electrical and Mechanical Engineering, Automotive Marketing and Basic Education, such as vehicle inspection and maintenance, automotive manufacturing and assembly, computer numerical control technology, electrical automation, automotive marketing and technical service, and logistics management (Figure 32).

![Figure 32. Course of vehicle inspection and maintenance & automotive manufacturing and assembly](image)

The Institute always adheres to the administration concept of “our existence only serves the need of human resource”, in order to keep up with the up-to-date demand of the enterprise. The characterized intensive integration of the Institute and the enterprise, as well as the outstanding advantage of state-owned enterprise foundation, could tightly bind the Institute to the automobile industry chain and the market demand to foster more and more highly qualified professionals. The education that the Institute provides focuses not only on academic aspect but also on ability and quality of students. Besides specialty knowledge, students could gain extra on morality, culture, arts and sports under competent guidance of teachers. Over the years, many students have proved their professional excellence by the prizes from competitions on national and provincial levels.

### 3.1.2 Economical aspect

The Institute is not like traditional universities which isolate themselves from outside. On the opposite, its door is widely open to the society. The joint mode of education – enterprise-based college, has provide students with precious opportunity to get in touch with reality immediately after learning knowledge in the classroom. The Institute also works as an advanced training base for employees at the enterprise, which needs further professional knowledge in their fields. Furthermore, the Institute combines itself tightly with automotive-related businesses. Its campus has left enough space for 4S shops of some famous automotive brands, for transfer agencies of logistics companies, and for automotive research and development labs of universities. Such broad cooperation with others has brought abundant benefit to the Institute not only on the fame but also on local economy.
3.1.3 Political aspect

The Institute has obtained a great evaluation for its contribution to the society and its social influence. The Ministry of Education has entitled the Institute “National Outstanding Training Unit of Professional Skills” and qualified it for “College Professional Training Assessment Evaluation” in the year of 2003 (Baidu, 2009). The president of Changchun Automobile Industry Institute was awarded the prize of “100 Asian Elites in Management and Innovation” by State-owned Assets Supervision and Administration Research Center in 2004 and invited to participate in Zhongnanhai Forum by Prime Minister on November 16th, 2006. Some of the most excellent graduates, Wang Hongjun for example, who received the Second Prize of “National Scientific and Technological Progress Award”, was also invited to pay a formal visit to Chairman and Prime Minister on 27th February, 2007 (Changchun Automobile Industry Institute, 2009b) (Figure 33).

![Figure 33. Honorable visits to political leaders](image)

3.2 Overall Introduction

The official name for the project is Campus Planning for Changchun Automobile Industry Institute, China. Its ultimate goals are: to realize the services of the Institute on professional education, training, further education, evaluation of professional skills and technical support; to satisfy the demands on high-quality professionals of China First Automotive Group Corporation and local industries in Jilin Province; and to set up an open, modern and high-level training base for automobile professionals nationwide.

3.2.1 Project location

The site for new campus construction is situated in Changchun Automotive Industries Development Area, north to Dongfeng Street, west to Jia’er Street and east to Yongchun River. It has a total area of 494,604 m² and currently it is used for farmland (Figure 34-36). The old campus, which is close to China First Automotive Group Corporation at the moment, cannot satisfy the future development of Changchun Automobile Industry Institute. Therefore the
Institute has decided to construct a new campus that can both fulfill educational functions and reflect modern concepts of campus planning.

Figure 34. Existing site conditions

Figure 35. Locations of China FAW Group Corporation, old campus and new campus of CAII
3.2.2 Scales

The new campus is anticipated to accommodate 10,000 students from five departments, plus 5,000 for further education and 14,000 for professional training every year. The scales of the five departments are as following:

<table>
<thead>
<tr>
<th>Department Name</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Automotive Application</td>
<td>2,640</td>
</tr>
<tr>
<td>Department of Automotive Marketing</td>
<td>2,040</td>
</tr>
<tr>
<td>Department of Electrics</td>
<td>1,920</td>
</tr>
<tr>
<td>Department of Mechanics</td>
<td>1,800</td>
</tr>
<tr>
<td>Department of Automotive Maintenance</td>
<td>1,600</td>
</tr>
<tr>
<td>Further Education</td>
<td>5,000 per year</td>
</tr>
<tr>
<td>Professional Training</td>
<td>14,000 per year</td>
</tr>
</tbody>
</table>

Table 1. The scales of the five departments, CAII

3.2.3 Contents

The plan for new campus includes three parts: main architectures, road system and landscape. Here main architectures are listed below as sub-projects and specific requirements on them are summarized as well.
<table>
<thead>
<tr>
<th>No.</th>
<th>Sub-project Name</th>
<th>Construction Area(m²)</th>
<th>Phase I</th>
<th>Phase II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Department of Automotive Application</td>
<td>20,000</td>
<td>20,000</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Department of Electrics</td>
<td>8,000</td>
<td>8,000</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Department of Automotive Marketing</td>
<td>10,000</td>
<td>10,000</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>public teaching building</td>
<td>16,000</td>
<td>16,000</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>library</td>
<td>16,000</td>
<td>16,000</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>industrial center</td>
<td>7,500</td>
<td>7,500</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>public training center</td>
<td>9,000</td>
<td>9,000</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>further education and training center</td>
<td>4,200</td>
<td>4,200</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>HR service center</td>
<td>2,000</td>
<td>2,000</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>administration building</td>
<td>5,000</td>
<td>5,000</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>open-air playground</td>
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<tr>
<td>12</td>
<td>service center 1</td>
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</tr>
<tr>
<td>13</td>
<td>service center 2</td>
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<td>5,000</td>
<td>0</td>
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<td>5,000</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>student dormitories</td>
<td>90,000</td>
<td>50,000</td>
<td>40,000</td>
</tr>
<tr>
<td>16</td>
<td>canteens</td>
<td>15,000</td>
<td>10,000</td>
<td>5,000</td>
</tr>
<tr>
<td>17</td>
<td>Department of Automotive Maintenance</td>
<td>8,000</td>
<td>0</td>
<td>8,000</td>
</tr>
<tr>
<td>18</td>
<td>Department of Mechanics</td>
<td>8,000</td>
<td>0</td>
<td>8,000</td>
</tr>
<tr>
<td>19</td>
<td>student union</td>
<td>6,000</td>
<td>0</td>
<td>6,000</td>
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<tr>
<td></td>
<td><strong>SUM</strong></td>
<td><strong>244,500</strong></td>
<td><strong>177,500</strong></td>
<td><strong>67,000</strong></td>
</tr>
<tr>
<td></td>
<td><strong>● outdoor sports field</strong></td>
<td><strong>44,440</strong></td>
<td><strong>44,440</strong></td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2. The list of sub-projects

Specific requirements on sub-projects:
1) Department of Automotive Application: including classrooms, practical training area and offices, appropriate location on campus.
2) Department of Electronics: including classrooms, practical training area and offices, appropriate location on campus.
3) Department of Automotive Marketing: including classrooms, practical training area and offices, appropriate location on campus.
4) Public teaching building: including classrooms, offices, computer labs and network center, appropriate location on campus.
5) Library: including multimedia center and 750 lecture halls, 3,400 seats in total.
6) Industrial center: two floors with 3,750 m² each, mainly for Department of Automotive Application, strictly fire control and located close to the east gate.
7) Public training center: three floors with 3,000 m² each, mainly for Department of Mechanics,
with functions of CNC machining, general machining and welding.

8) Further education and training center: including classrooms and offices, mainly for further training and adult education.

9) HR service center: including service hall, information desk, interview rooms, computer rooms and offices, mainly for admission, employment and professional skills evaluation.

10) Administration building: gross floor area of 5,000 m$^2$.

11) Open-air playground: including basket court, badminton court, table tennis court, gym and auxiliary rooms.

12) Service center 1: including 80 sets of standard guest rooms, restaurant and entertaining area, relatively independent, strictly fire and security control.

13) Service center 2: including 50 sets of standard guest rooms, restaurant, offices, lecture hall and multimedia classrooms, relatively independent, strictly fire and security control.

14) Subsidiary corner: including health care center, public bath, commercial service, post depot and bank service, guardhouse, warehouse, maintenance area, power control area, pumping station, heating station and gas station.

15) Student dormitories: separated housing for male and female with a proportion of 7:1, 4-person and 6-person room with shared bathroom, south-faced as much as possible, good ventilation and illumination.

16) Canteens: implemented in two phases, two cafeterias in Phase I (accommodating 4,000 and 2,000 separately).

17) Department of Automotive maintenance: including classrooms, practical training area and offices, appropriate location on campus.

18) Department of Mechanics: including classrooms, practical training area and offices, appropriate location on campus.

19) Student union: including 1,500-seat auditorium, multimedia hall, musical studios, dance studios, radio station, offices and warehouse.

Outdoor sports fields: including a sports complex, 20 basketball courts, 10 tennis courts and 2 physical training courts.

3.2.4 Major regulatory index

<table>
<thead>
<tr>
<th>Index Name</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total area</td>
<td>494,604 m$^2$</td>
</tr>
<tr>
<td>Total construction area</td>
<td>244,500 m$^2$</td>
</tr>
<tr>
<td>Construction area in Phase I</td>
<td>177,500 m$^2$</td>
</tr>
<tr>
<td>Construction area in Phase II</td>
<td>67,000 m$^2$</td>
</tr>
<tr>
<td>Green coverage ratio</td>
<td>&gt;40%</td>
</tr>
<tr>
<td>Height limit</td>
<td>&lt;36 m</td>
</tr>
</tbody>
</table>

Table 3. Major regulatory index
3.2.5 Financial resources

Preliminary budget for the project will be roughly 70 million Yuan (around 7 million Euros) and it comes from three resources: special fund for education from local government (amount unfixed so far); sales benefit of old campus site to China First Automotive Group Corporation (3 million Yuan or 0.3 million Euros); bank loans which the Institute will settle itself (amount unfixed so far).

3.2.6 Policy support

Besides absolutely necessary legal procedures for construction, the project also consults “The Index of Construction Areas for Colleges and Universities” (Document Jian Biao [1992] No.245) issued by Ministry of Construction, State Planning Commission and State Education Commission.

3.2.7 Construction phases

The project will be implemented in two phases. The first phase started on April 1st, 2009 and will be completed in October 2009; the second phase will focus on the left parts and be finished in October 2010.

3.3 SWOT Analysis

To thoroughly analyze existed site conditions, the measure of SWOT Analysis is employed here. It could specify the characteristics of the project and identify the internal and external factors that are favorable and unfavorable for the anticipated goal.
### 3.4 Planning Strategies

As a specialized institution for professional education, Changchun Automobile Industry Institute has more advantages than traditional colleges and universities to apply new concepts and ideas to campus planning. Firstly, it doesn’t have too demanding majors which will require many hi-tech and advanced facilities, so there is less workload to consider such complexities. Secondly, the joint mode of administration on the Institute, by China First Automotive Group Corporation and the municipality government, will give more freedom and broader space for its development. Lastly, the project will be constructed on a totally new location which has no hindrance at all, therefore pilot planning trends could be introduced and employed without any difficulty.

In Chapter 2, three major background theories and methodologies are reviewed and analyzed in details. They have enlightened the way to plan a campus which has community characters for Changchun Automobile Industry Institute. Six planning strategies will be concluded covering three parts – main architectures, road system and landscape, they are: Community fabric; TOD node; Organic order; Nature reserve; Step-by-step development; Public involvement.
3.4.1 Community fabric

Educational institutions, such as colleges and universities, and surrounding communities should never confront each other because they are two inseparable components of the whole urban environment. While the former focus on the cultural life for cities, the latter pays more attention on essential accommodation. While being independent on their own identities, the two parties should also allow intercommunication and cooperation.

Here a new planning structure is introduced, not only for the campus itself but also for the surrounding neighborhoods together – community fabric. Basically the whole campus can be regarded as a community, because besides major function of education, it almost has all functions that a community has: residential (student dormitories), commercial (groceries, supermarkets, etc.), public service (hospital, post office, bank, etc.), cultural (library), sports (sports center), entertainment (local cinema) and infrastructure (road system). Furthermore, the facilities for further education and training obviously have more social characters as hotels; and the ideas of bringing in automotive 4S shops, logistics companies, and research labs of universities will add more mixed functions to the campus. The complexity of campus constitution will make itself as a local center among surrounding neighborhoods, thus promote intercommunication and cooperation with others.

Specific patterns:
1) The five departments should have different architectural styles of their own to express strong identities. Minor commercial stands should be set up accordingly to satisfy different needs.
2) Architectures of student dormitories should be enclosed or semi-enclosed, in the form of local neighborhoods. Auxiliary functions such as commercial, public service and entertainment should be set up accordingly nearby; infrastructure and sports areas should be located relatively far away; and other educational buildings should be situated within 10 to 15 minutes walking.
3) Facilities for further education and training are rather independent compared to others. Therefore they can be planned separately from major campus together with automotive 4S shops and logistics companies.
4) Inside the community pedestrians should be considered with priority. However, mixed traffic is encouraged as well to reduce the dullness of single traffic.
5) The center of the community should be constituted by versatile elements: cultural, sports, entertainment and nature reserve. Landscape should be much accentuated here on themes, styles and expressions.

3.4.2 TOD node

Modern universities are no longer isolated and enclosed as in medieval times. They have been included in the system of urban development since the very beginning when they were situated and built up. The physical linkage between urban environment and universities – transportation
system, takes a crucial effect to connect the two and therefore it needs much consideration during the process of urban planning. A successful and efficient transportation system could open the enclosed ivory tower to the society and help realize mutual exchanges of information and material, consequently could assist in improving the relationship between universities and cities.

Based on The Master Planning of Changchun (2005-2020) (Changchun City Planning, 2009) and The Master Planning of Changchun Automotive Industries Development Area (Changchun Automotive Industries Development Area, 2009), a bold vision is proposed here to enhance the connection between Changchun Automobile Industry Institute and city center. The concept of TOD (Transit-Oriented Development) is brought in and the Institute is planned to be a node on the transport chain from city center to Changchun Automotive Industries Development Area (Figure 37). The multi-functions within the Institute (educational, residential, commercial, public service, cultural, sports, entertainment, etc.) will work together to sustain the “community” and the infrastructure will relate it tightly to city center. By means of Transit-Oriented Development, both internal and external connections can be established and the Institute will never be excluded from the city for the reason of distance.

Specific patterns:
1) A transit station (light-rail/ bus) should be set up combined with the campus, especially with further education and training center, service centers and subsidiary corner, as well as automotive 4S shops and logistics companies. The multi-functions and mixed land-use will increase the appeal of the Institute, raise the land value, bring in more development and accelerate regional economy growth in the future.

2) Pedestrian network and bicycle paths within the campus needs complete and detailed planning. Major functions such as public teaching building, library, student dormitories, canteens, sports center and subsidiary corner should be located within walkable distance. Amount of vehicle traffic is strictly limited within students living area and numbers and locations of parking lots should be considered together with different entrances all over the campus. Public opinions, mainly from students and teaching staff, should be considered with priority because they are the main body to use the campus.
3.4.3 Organic order

Organic describes forms, methods and patterns found in living systems as the organization of cells, to populations, communities, and ecosystems. Typically organic models stress the interdependence of the component parts, as well as their differentiation. Other properties of organic models include: the growth, life or development cycle; the ability to adapt, learn and evolve; emergent behavior or emergent properties; steady change or growth, as opposed to instant change; regulatory feedback; composed of heterogeneous (diverse) parts (Wikipedia Organic (model), 2009).

When applied to urban planning and design, organic order emphasizes interrelatedness among the site, buildings, furnishings and surroundings. It combines all components into a unified whole, with each adapted to the others. It also helps avoid incongruity, disturbance, collision even opposition among the components. Such a natural order is exactly what we need urgently nowadays when all sorts of dull and massive junks congest our cities.

Learnt from The Oregon Experiment, organic order is adopted here as the planning strategy for Changchun Automobile Industry Institute. It works more as guidance for the campus development than a fixed master plan. As an organism, the campus will gradually obtain the most adaptive form by numerous times of growing, reparation or even regeneration. An abrupt and rigid framework would only constrain the campus from developing in a free and adaptive way itself.

Specific patterns:
1) Major functional zones (educational, residential, commercial, public service, cultural, sports, entertainment, etc.) can be divided according to the requirements from the Institute. They will be allocated to relevant users for further discussion on how to develop them in details. For example, the five departments are encouraged to hand in their thoughts about the use, scale, architecture style, auxiliary function and rough budget about the plot. Other stakeholders, such as real estate developers, representatives from bank, post office, automotive 4S shops and logistics companies, should also be invited to express their opinions. Students and teaching staff are the most important in final decisions on locating and functionalizing sub-projects on campus.

2) Road system should be situated only when they are in need. Reduce excessive amount and rigid distribution of hard pavement. This should be considered together with landscape arrangement. It is very important to remember that the Institute is built in nature but not squeezing nature into the campus.

3.4.4 Nature reserve

Since human beings took the leading position on earth, the nature has suffered a lot from our footprints. More and more side effects of human activities, such as deterioration of ozone layer, greenhouse effect and global warming, are threatening our life and effective measures must be
taken from now on to compensate such situation. The planning strategy concerning nature reserve is proposed here under such circumstances. It will mainly focus on how to improve the relationship between nature and built environment. It might be too ambitious to say how much contribution this strategy will make to protect the environment, but at least it proves the change of human attitudes and thus is worth trying.

Specific patterns:
1) A highly compact and mixed land-use is recommended during the planning, to save existing natural resource as much as possible.
2) The concept of “nature reserve” is proposed to describe the green structure on campus. The center of the campus should be highlighted by large area of greenery and the same to sub-centers within different functional zones; radiating from central green areas, greenbelts will extend to surroundings to form the structure all over the campus; large green areas and greenbelts will surround the campus as “soft boundary” and gradually merge with background landscape. The structure of “point-line-surface” will to the most extent bring the campus into the nature without weakening the existence of the latter.
3) The landscape system will include two types: natural and artificial. They will be arranged according to practical situation. For the five departments, different landscape themes will be designed as foils following their architectural styles and textures. For living areas, especially around student dormitories and sports center, landscape serves as a shelter from outer disturbance. For community center and transfer station, more delicate and characteristic landscape should be arranged as accentuation.

3.4.5 Step-by-step development

As mentioned before, an organism grows and develops in a long and gradual way to reach the fittest balance eventually. The same could be applied to the planning for Changchun Automobile Industry Institute. The project will have a total area of 494,604 m² for 10,000 students from five departments, plus 5,000 for further education and 14,000 for professional training every year. Such a large-scale construction will certainly need long period to complete and necessary modification and adjustment are inevitable.

In the experimental plan for the University of Oregon, Christopher Alexander and his planning team proposed the principle of “piecemeal growth” to build and develop the environment. The essence of this principle is borrowed here to form a new planning strategy for the project – step-by-step development. There are two reasons for the strategy: first, although the start-up funding is ready now, it is not enough to complete the whole project, and bank loans will come later according to the practical situation of construction; second, to a specialized college for professional education, demolition of constructions and facilities at the old campus is not only a waste in material and money, but also a damage to the relationship between the Institute and China FAW Group Corporation.

Specific patterns:
1) According to the requirements of the Institute, 15 sub-projects will be implemented during
Phase I and the other 5 – Part of student dormitories and canteens, student union, Department of Automotive Maintenance, and Department of Mechanics belongs to Phase II. It would be positive if the Institute agrees that the development will be carried out in a gradual way, that is, still keeping the old campus site while constructing the new one. Such step-by-step development could help keep the relationship between the Corporation and the Institute, preserve the “Genius Loci” at the area, and attract more enterprises within the same fields in the future. A “corridor” mode for regional development could be established according to such planning strategy, therefore could bring in more opportunities and incentives for local economy.

2) In the area between China FAW Group Corporation and the Institute, existing installments are encouraged to be re-used for future development according to different needs. Large area of farmland and nature reserve should be preserved as green wedge for ecological reason.

3) For the new campus, among the sub-projects during Phase I, functional buildings for education and living areas (student dormitories, canteens, subsidiary corner and sports corner) have first priority to be implemented. Facilities for further education and training, service centers, as well as other commercial areas, should be developed on the basis of the transit station.

3.4.6 Public involvement

The purpose of the project is to provide better education and service for students and teaching staff, therefore the users should be paid much attention because they know exactly what they need and how the environment functions around them. Besides, real estate developers, public service suppliers from bank and post office, representatives from other automotive enterprises and logistics companies, and public transportation planners, should also be invited for advices and suggestions for the projects. The traditional “top-down” mode of decision-making should be gradually replaced by new and democratic “bottom-up” mode.

Specific patterns:

1) “Public involvement” means to join in, to work with and to share the achievement. Therefore users, especially students and teaching staff, are encouraged to express their needs to planners to help improve the quality of the project. Certain numbers of representatives from students and teaching staff will be elected to join in the planning team. It is cooperation but not opposition that is in need between professionals and populace.

2) Not only cooperation but also coordination is necessary for the planning process. It means the act that makes different stakeholders work together for a common goal. Users of the project, together with real estate developers, public service suppliers from bank and post office, representatives from other automotive enterprises and logistics companies, and public transportation planners, they should also reach a consensus on certain crucial issues, such as preferable types of dormitories and flats, locations and amounts for public services, management on enterprises within the campus, and suitable radius from transit station to the living areas.

3) Participation involving residents in surrounding neighborhoods is also crucial for the project.
Such intercommunication between the Institute and surrounding neighborhoods will help form a varied demographical constitution, and urban life style could be diversified as well. The well mixture between “town” and “gown” will give the city a more open and dynamic atmosphere, enhance the value of the city, and stimulate economic expansion of the region.

3.5 Planning Proposal

According to the six planning strategies explained above, some illustrations are presented to help better understand the concept of “Community Campus” for Changchun Automobile Industry Institute.

3.5.1 Community vs. Hierarchy

As time pass by, universities are no longer enclosed and isolated from surrounding society. A university, with multi-functions and almost all urban components, should be regarded as the same as a community. Accordingly, the old hierarchy of “administration-teaching-learning” should be replaced with equality and harmony.

The old campus, as shown in Figure 38, appears in a strictly symmetrical form. The administration building stays in the center surrounded by different teaching buildings. Obvious axis from south to north could be abstracted. The reason for the arrangement could be traced back to the foundation period of the Institute in the early 1980s. At that time, reformation had not been carried out and most of architecture still kept old conservative “brick” style.

Figure 38. Model of old campus of CAII

On the opposite, the new campus emphasizes much in equality and harmony. The centripetal layout of different functional groups (educational; residential; commercial; public service; cultural; sports; entertainment and infrastructure) with living quarters in the middle has created more lively and intimate characteristics for the users and aroused their feelings of “a community” more than “a working place” (Figure 39).
3.5.2 TOD vs. Isolation

The strategy of “TOD node” is proposed for the new campus planning to enhance the linkage between the Institute and the city center. The place for new project is much further than the old site so that a fluent traffic linkage is crucial for internal and external connections of the campus. On the aspect of internal connection, road system is used to divide different functional zones and pedestrians and bicycle paths are encouraged more than vehicles within the campus; on the aspect of external connection, a transit station will be set up in the area where the most traffic flows appear. It could be combined with service corner and further educational and training center, as they could fulfill diverse requirements from different customers (Figure 40).
3.5.3 Nature reserve vs. Environmental impact

The new campus will be built in a large area of old farmland. Excellent natural conditions provide great potential for environmental benefit of the Institute. The strategy of “Nature reserve” is introduced to utilize the nature reserve to the most degree without weakening the environment (Figure 41, 42).

“Nature reserve” means the green structure on campus. There are two types about it: natural and artificial. The whole campus will be sustained with the structure of “point-line-surface”, that is, landscape in the campus center and sub-centers work as “point”; different points connect to each other to form “line” and the whole campus together with surrounding natural environment form the “surface”.
3.5.4 Step-by-step development vs. Urban sprawl

There are two reasons for the strategy of “Step-by-step development”: first, although the start-up funding is ready now, it is not enough to complete the whole project, and bank loans will come later according to the practical situation of construction; second, to a specialized college for professional education, demolition of constructions and facilities at the old campus is not only a
waste in material and money, but also a damage to the relationship between the Institute and China FAW Group Corporation.

A “corridor” mode for regional development could be established according to such planning strategy, therefore could bring in more opportunities and incentives for local economy. In the area between China FAW Group Corporation and the Institute, existing installments are encouraged to be re-used for future development according to different needs. For the new campus, among the sub-projects during Phase I, functional buildings for education and living areas (student dormitories, canteens, subsidiary corner and sports corner) have first priority to be implemented. Facilities for further education and training, service centers, as well as other commercial areas, should be developed on the basis of the transit station (Figure 43, 44).

Figure 43. Model of new campus of CAII – Step-by-step development 1
Figure 44. Model of new campus of CAII – Step-by-step development 2
4 Discussion: “Community Campus”

4.1 Conclusions

Universities are urban components and they should never be considered completely independent on cities. However, universities still have their unique features. They appear more on a cultural and spiritual level than material life in cities. That is why in medieval times the ivory towers enclosed themselves so tightly that all connections with outer society had been cut down. As time passes by, it has been proved that the opposition between “town” and “gown” is no longer appropriate and the relationship between universities and cities should be improved by new means. An open and modern university should promote more communication and cooperation with its surrounding neighborhoods to achieve a common success in development.

To find out a new method to improve the relationship between universities and cities, and provide some experience for similar cases in the future, we take the project of campus planning for Changchun Automobile Industry Institute for further research. First three background theories and methodologies are studied in details, they are: Town and Gown – relationship between universities and surroundings; The Oregon Model – an attempt to apply architectural pattern language and social power to the plan for The University of Oregon; Transit-Oriented Development – efficient way to connect traffic node with city center for sustainability. Then a thorough introduction about the project follows and a detailed analysis is given as well. Six planning strategies about “Community Campus” are concluded here, covering three parts of the planning: main architectures, road system and landscape, they are: Community fabric; TOD node; Organic order; Nature reserve; Step-by-step development; Public involvement.

4.2 Significance

This thesis aimed to explore a new way to plan university campus as an everyday community, which works as a local center meanwhile connected tight to surrounding urban life. Through the campus planning for Changchun Automobile Industry Institute, three major achievements are acquired on planning concept, planning strategies and planning vision.

4.2.1 New concept

A new concept of “Community Campus” is proposed in the planning. It means to regard the university campus as one of components of the city and to connect it with both surrounding neighborhoods and city center. It emphasizes interrelationships within urban environment and encourages an open and interactive way to develop towards a common goal among all members. The concept will be first applied to the campus of Changchun Automobile Industry Institute and then propagated to other educational institutions with similar situations if it works fine.
4.2.1 New strategies

New strategies to plan a “Community Campus” are concluded on the basis of thorough research of the project. They are abstracted from three background theories and methodologies – Town and Gown development, The Oregon Experiment and Transit-Oriented Development, to regulate and form an adaptive campus to the changes of times, functions and relationships.

4.2.3 New vision

The concept “Community Campus” together with six planning strategies set up a new vision for similar cases in the future. In a society where all components are more or less related to each other, an enclosed and isolated member of only one function cannot survive. Adjustment, adaptation and advancement are essential points that modern universities need urgently.

4.3 Future Research

Due to the requirements from the Institute and the limits of time, this thesis mainly focuses western universities as examples and absorbs their essence to apply to the project. However it should be forgotten that there are other excellent and appropriate cases all over the world. In future research on such topic, they should be carefully studied as well to provide more information and advice. Besides, the differences about the organization and administration of universities between western and eastern countries are also worth further researching, because it will help realize public participation in a genuine democratic way.
5 Summary

This thesis is carried out in a step-by-step way. The introductive part gave detailed information about the origin, development, organization and classification of university and its campus. Then the research problem is put forward and theoretical framework is built up on the basis of three relevant background theories and methodologies. In case study of campus planning for Changchun Automobile Industry Institute, a new concept of “Community Campus” is introduced and presented. Six planning strategies are concluded as well, covering three parts of the planning – main architectures, road system and landscape, they are: Community fabric; TOD node; Organic order; Nature reserve; Step-by-step development; Public involvement. In the end of this thesis, the outcome and its significance are concluded and evaluated, followed by possible recommendations about future research on the topic.
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