Oshu City ILC City Development Vision
Reaching for Infinite Possibility
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1 Introduction

The city of Oshu has a historically close relationship with astronomy and science. In the Edo period, Obata Chutatsu of Mizusawa was said to have created a globe-shaped instrument for astronomical observation called an armillary sphere. Choei Takano, a Rankgaku scholar of the late Edo period, learned western style medicine and wrote in his work “Seigaku Ryakki” about the movements of planets and sunspots. In 1902 (Meiji 35) the first head of the Mizusawa Latitude Observatory (now Mizusawa VLBI Observatory) Dr. Hisashi Kimura announced his discovery that adding a revision called the “Z term” allowed more accurate calculations of the variance in the tilt of the earth’s axis and became famous throughout the world.

Now, the Mizusawa VLBI Observatory uses a parabola antenna spanning 20 meters and together with the observatories in Iriki (Kagoshima Prefecture), Ogasawara (1000 kilometers south of Tokyo) and Ishigakijima (Okinawa) measures the distance and movement of bodies in the milky way as the VLBI project works to reveal the true shape of the galaxy.

This is Oshu city’s heritage as an area traditionally linked with astronomy and science.

1) Purpose

The ILC (International Linear Collider) is a large scale research facility to be built in an underground tunnel spanning 31 – 59 kilometers. This linear accelerator would be the world’s largest next generation positron-electron collider. In this massive project, researchers from all over the world are working together to build this ILC, the only one of its kind.

Building this world-class facility within Japan would not only rapidly advance physics in Japan, but would enable Japan to contribute to science worldwide as an international intellectual hub and beacon of science and technology and play an important role in humanity’s progress.

If the children in this region—the key to our future—could directly see, touch and learn about the world’s leading technologies from top class researchers, the educational environment in this area would rapidly improve, producing great numbers of workers active on the world stage.

The cutting edge technologies used with the ILC can further be adapted for various fields, and the numerous innovations born from this could make a large contribution to economic development and regional invigoration not only in this area, but in Iwate Prefecture and Tohoku as a whole.

Because the ILC is a cutting edge international project and many leading researchers, engineers and their families would gather in the area, this area would serve as a truly global city.

We want to develop a city brimming with dreams that will be in harmony with this ILC, and hopes. We will take advantage of the ILC, show the world what is already wonderful about this area, cultivate our human resources and our region and develop a city that makes people happy they decided to live here.

The Oshu ILC City Development Vision will outline a future vision for Oshu to strive for through its relation with the ILC, as well as an action plan to move towards our ideal city in collaboration with many related organizations.
2) Role

The Oshu ILC City Development Vision is a long-term future vision of our city for welcoming the ILC, keeping in mind our area’s science culture and international contributions. The objectives and efforts in this vision will be carried out in cooperation with various fields. At the appropriate times, objectives and efforts will be used in the Oshu City Comprehensive Plan, interact with and complement plans including Oshu City Master Plan and Oshu City Environmental Plan as we work to make this vision a reality.

3) Implementation Period

The Oshu ILC City Development Vision covers the period from now until the ILC starts full operation.

4) Progress

The Oshu ILC Promotion Division and Oshu City ILC Promotion Conference will coordinate the progress of measures included in this vision, making progress while considering the respective roles of Oshu city, its citizens, businesses and related organizations.
2 Summary of the ILC and its Potential

1) ILC Summary

The ILC (International Linear Collider) is a next generation linear collider (particle accelerator) to be built in an underground tunnel spanning 31 – 59 kilometers long. Researchers from all over the world are working together to build this ILC, the only one of its kind. Currently, organizations including the LCC (Linear Collider Collaboration), the organization of particle physicists working to advance the ILC project, are making preparations for construction. The Kitakami mountain range, which includes Oshu city, has been assessed as the most suitable domestic candidate site.

The ILC will accelerate electrons and positrons to close to the speed of light and then collide them together to create a manmade reenactment of the state a trillionth of a second after the Big Bang in order to reveal the structure of space-time and the origin of matter, pursuing the answers to the riddle of the origins of the universe.

Currently, the Large Hadron Collider in CERN, Switzerland is the largest particle accelerator in the world. The ILC is the next generation particle physics research facility to follow the LHC, developed under an international agreement between the world’s scientists and engineers. The realization of the ILC will make this area a leader in the world’s particle physics research.

The criteria for the candidate site were for a stable, hard rock bed with very few manmade sources of vibration and good access to the surface. The Kitakami candidate site has a stable rock bed with a wide swath of granite, and is not a steep mountain range. In terms of convenience and livability, the candidate site also needed to have good links with surrounding urban areas and hub cities and have a good transportation access infrastructure. The Kitakami candidate site is outstanding in this sense as well for the activities and concentration of research facilities, as it is close to Tohoku Expressway interchanges and Tohoku shinkansen stations. Because of these reasons, the Kitakami mountains were assessed as the strongest candidate site.
### Summary of Hubs, Areas Composing ILC International Science and Technology Zone

<table>
<thead>
<tr>
<th>Hub/Area</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>① ILC (International Linear Collider)</td>
<td>• Longest linear accelerator experimental facility in the world (Underground)</td>
</tr>
<tr>
<td>② ILC Accelerator Laboratory Site (Detector hub)</td>
<td>• Concentration of main facilities for ILC detection (Experimental hall, detectors (ILC, SiD), operation center) • To be constructed above ground near ILC collision point</td>
</tr>
<tr>
<td>③ ILC Central Campus (Central research hub)</td>
<td>• Location for ILC research laboratory headquarters • Concentration of research management facilities, experimental and research facilities, facilities for conferences and socializing, living and lodging facilities, service facilities, data supply and processing facilities, etc. • Prepare minimum necessary functions for the lodging and living needs of short-stay researchers, etc.</td>
</tr>
<tr>
<td>④ Cutting Edge Industry Concentration Hub (Science, technology and industry park)</td>
<td>• Concentration of research and development and prototype development functions for cutting-edge technology and industry used in ILC related technological innovation (accelerator industry, manufacturing, information and communications, particle beam industry) • Concentration of support functions including technical human resources training, incubation, and business support</td>
</tr>
<tr>
<td>⑤ Off-campus Residential District (Multiple)</td>
<td>• Provide residential area that compactly provides housing, stores and services for ILC researchers, workers and their families.</td>
</tr>
<tr>
<td>⑥ Pre-existing City</td>
<td>• Concentration of city functions to support ILC researchers, workers and their families in their everyday lives.</td>
</tr>
</tbody>
</table>

### Model of Commute, Living Areas for the ILC

Source: KEK “Study of the ILC Project Infrastructure Design Guidelines” (February 2014)
2) The ILC's Potential for City Planning

We are currently faced with many issues, with not necessarily easy solutions. However, there are many outstanding things special to this area. We must use what we have and develop our city in a way special to Oshu, not lament what is not here. The ILC holds many possibilities, and by making good use of it, Oshu can solve many of the problems it faces, adding meaningful hopes and dreams to our future.

Here, we will outline three ways the ILC can change our area.

Potential of the ILC

○ Discovery of New Technologies and New Knowledge

Accelerator researchers and engineers from all over the world will be involved during the ILC’s construction, and a large research hub where facilities including international research facilities will concentrate is expected to develop near the ILC when it starts operation.

The research conducted there can lead to discoveries and accomplishments in fundamental science previously unknown to humanity and contribute to the progress of fundamental science in Japan, Asia and the world. The ILC’s construction and research and development can bring about innovation not just in technology application directly related to accelerators, but affiliated technology in mechanical manufacturing, electronics, communications, and fields such as superconductivity, medicine, environment/energy, and life science.

○ New Activity Born from New Connections

About 10,000 researchers and other visitors come to CERN every year. Many researchers, engineers and their families are also expected to come to live near the site in the ILC’s case.

This will cause a dramatic increase in interaction between local and international residents. The influx of high-level scientific and technological human resources such as researchers and engineers would lead to improved science education and fostering various kinds of workers. It would not be unheard of for many Nobel Prize winners to come from here.

○ A Sustainable Society Harmonizing with Nature

The ILC is a large research facility, but will be built underground to be less affected by the surface, and the plans being discussed take the surrounding natural environment into consideration. The electricity needed for the ILC has been calculated to be about 1% of the maximum demand within Tohoku Electric’s territory, but related organizations are considering energy conservation technologies and how to use renewable energy sources.

The ILC project will promote harmony between the environment and people who live there, building a new long-term sustainable relationship between the two. It will also contribute to forming new sustainable kinds of local community, including for economic and population issues, by creating new industries and bringing in human resources.
As stated above, the ILC project holds unlimited possibilities and would bring a vast amount of people, things and information to this area. If we can seize the opportunity to change this city, we can make Oshu into an even more wonderful place.

3 Vision for Oshu’s Future

**Future Vision 1, City Planning that Creates the Future in Oshu City**
- We will proactively involve the ILC in our policies, effectively integrate science, technology, education and industry, and work to develop the next generation of workers and create new industries to make an international innovation hub of science and technology a reality.

Explanation

An international science and technology innovation hub would have many positive effects on Oshu, and would also make various contributions to not just the local community but to all of humanity.

- We will aim to be an active city through involvement of local businesses with the ILC’s construction and operation.

Explanation

There are many businesses within Oshu that have the potential to contribute to the ILC’s construction and operation. Creating a system where that potential can be used will give the entire area a chance to make a huge leap forward.

- We will work to promote tourism that takes advantage of what makes Oshu special, using various facilities and activities related to the ILC to create a new leading tourist attraction for Tohoku in Oshu.

Explanation

In addition to other kinds of tourism such as reconstruction tourism, which traces Tohoku’s steps towards recovery and relates the lessons of the 2011 Tohoku Earthquake and Tsunami, the various facilities and activities related to the ILC will produce the largest science tourist attraction in Japan.

**Future Vision 2, City Planning with Connections Overcoming Time and Distance**
- We will enhance the things necessary for an international science and technology innovation hub, including culture, housing, employment, education, childcare, medical care and transportation.

Explanation

There are many challenges to work on to make an international science and technology innovation hub a reality. Through collaboration between government and citizens not just within Oshu but within the wider areas of southern Iwate, all of Iwate, and Tohoku as a whole, we can find solutions to these issues while making the most of our respective strengths.
○ We will enhance Oshu's educational level through the ILC.

Explanation

Oshu city has produced many historically great figures and has a culture of valuing learning. We will continue this legacy of our predecessors, and use the ILC's potential to enrich our educational environment, making a city where anyone from children to senior citizens can live purposeful lives of learning.

○ We will create a city that both incorporates the world's cultures and values Oshu's traditional cultures and rich nature.

Explanation

Oshu city is rich in nature, history and traditional cultures, and produces high quality agricultural goods and handicrafts. We ourselves, however, are not always aware of how wonderful Oshu is, or of the value of our products. Through interacting with our new neighbors, we will become more proactive in sharing about our resources and will promote ourselves to the world.

○ We will create a new network between city and country, creating and promoting industries that make use of our area's special features.

Explanation

Cities and the country should harmonize with and complement each other. Oshu needs to create a new network between cities and the country, and create and promote industries that utilize Oshu's special features. It is especially necessary to promote primary industry to provide a stable supply of safe, high quality food, and to strengthen efforts for sixth sector diversification (directly marketing products).

Future Vision 3, City Planning that Harmonizes with Our Rich Nature and Culture

○ We will create a sustainable renewable energy system, working towards becoming a community that coexists sustainably with the environment and effectively utilizes the gifts of nature.

Explanation

To pass on the beautiful, rich nature of Oshu on to future generations, we need to create a sustainable society that harmonizes with nature.

○ We will make good use of our plentiful forest resources by working to provide lumber and biomass energy resources for ILC facilities. We will also aim to promote building with wood and using biomass energy locally to reinvigorate forestry.

Explanation

Oshu city is rich in forest resources, but these resources are not being used to their full potential. We need to prepare to provide lumber and wood biomass energy to ILC facilities and work to reinvigorate forestry.
Intense competition between cities to attract businesses, mismatched job supply/demand

Attract universities, research intuitions, etc.

More researchers, engineers

Create innovation hub

Bring in new young, senior citizen residents

Better employment

Revitalized 1st sector industry

Potential for new connections and new activities

Potential to discover new technologies and knowledge

Potential for a sustainable society coexisting with nature

“Hollowing out” of shopping streets

Less convenient transportation

No higher education institutions

Not enough high-level programs, education to study local culture

Worsened medical environment

Child-rearing quality decline from shift to nuclear families

Receiving int’l residents

Decline of agriculture, a core industry

Effective use of rich forest resources

Outflow of youth, Aging society, declining birthrates

Depopulation, aging of area

Not enough local leaders

Issues in Oshu

Potentials of the ILC

Potentials of the ILC

Potential for new connections and new activities

Potential to discover new technologies and knowledge

Potential for a sustainable society coexisting with nature

Attract universities, research intuitions, etc.

More researchers, engineers

Create innovation hub

Bring in new young, senior citizen residents

Better employment

Revitalized 1st sector industry

Oshu Future Vision

City Planning that Creates the Future in Oshu

City Planning with Connections Overcoming Time and Distance

City Planning that Harmonizes with Our Rich Nature and Culture
4 Action Guidelines for Oshu’s Future

To make these goals and visions of the future a reality, we need to work with the challenges Oshu city currently faces and make new developments that use Oshu’s strengths. The action guidelines in order to do this are outlined as follows.

1) Action Guidelines to Promote Local Industry
   I Promote industry that takes advantage of the ILC and connects with the world
   II Promote agriculture and forestry using Oshu’s resources
   III Create spaces and experiences attracting people from all over the world using what makes Oshu special

2) Action Guidelines to Promote a Multicultural Society and a Comfortable, Improved Living Environment
   IV So all kinds of people can live with peace of mind and in comfort
   V Where various cultures comingle and we feel pride in our area

3) Action Guidelines to Become an International Education City and Educate the Next Generation
   VI Educating people to excel on the world stage
1) Action Guidelines to Promote Local Industry

I Promote Industry That Takes Advantage of the ILC and Connects with the World

- Take advantage of the exchange of cutting-edge, multidisciplinary ideas for the ILC to create a diverse innovation hub.
- Through new combinations of, and exchange between, various fields, create new industries, increase jobs and number of ventures.

▶ Expected Benefits

- Link Oshu City's various manufacturing technologies with accelerator-related elemental technologies.
- Promote industry through networking between pre-existing local industrial concentrations and industrial parks.
- Create new industries from increased collaboration between industry, academic and government led by local businesses, universities and research facilities.
- Possible new uses for traditional craft industries such as Nanbu ironware and Iwayado Tansu.

Better Oshu Living

Innovation Hub

- New Innovations for User Industries
- New Innovations for Supplier Industries
- New Uses for Traditional Craft Industries
- Create New Industries
- Attract New Factories
- Create Venture Companies

Industry around Oshu's Innovation Hub is Invigorated: More Businesses and Jobs

University Satellite Campus

- Science Tourism
- Facility Tours
- Guest Classes
- Educate Human Resources

ILC Elemental Technology

Sharing Cutting-Edge Technologies

Research Lab

Higher Education Institutions

Local Businesses

Cooperation between industry, academia and government. Match businesses with accelerator work to prepare for involvement in ILC-related construction, manufacturing.

Local businesses raise their technological levels, adapt knowledge and technology from various fields. Increased industrial competitiveness in Oshu and surrounding areas.

New industries and ventures start within Oshu
Cutting-Edge Technologies and Related Industries Used with Accelerators, Fields

Using/Adapting Accelerators

**Fields using accelerators as key technology**
- **Food products**
  - Producing radioisotopes: Improved varieties, tracers, stopping germination
- **Medical uses**
  - Particle beams: Cancer exams, treatment, disinfection
  - Radiation: Medical diagnosis
- **Nanotech/materials**
  - Radiation: Reinforced materials, fine processing (nanomachines, ULSI)
  - Spectroscopy: Develop catalysts and functional material, non-destructive inspection, product management
- **Environment**
  - Spectroscopy: Microanalysis, pollution control
  - Processing nuclear waste: Convert long-lived nuclides to short-lived, reduced burden on environment
- **Material science**
  - Diffraction, diffusions: Analyze protein's functions and structure, create and grow crystals. (Develop medicine)

**Fields applying spin-off technologies**
- **Energy**
  - Electromagnets: Superconducting technology (linear motor cars, energy storage), develop electrical steelsheets and smaller electric devices, heavy goods vehicles
  - Control: Monitoring, automatic control/distributed control
- **Social infrastructure**
  - Super stable power sources, noise reduction devices
  - Radiology: Radiation work, radiation-resistant materials, measurement
  - Tunnel building: Public works technology, construction, high precision measuring
- **Manufacturing technology**
  - High voltage: High voltage insulators, ceramic materials
  - Vacuum: Ultrahigh vacuum materials/welding, vacuum pumps, clean vacuum/semitectors
  - High frequency: High frequency cavities, superconducting cavities, high powered synchrotron
- **Information and communication**
  - Calculation: High speed/high capacity networks, internet, grid technology
  - Particle detectors: High speed calculation, high speed electronics
  - **Frontiers science**
    - Bubble chambers: Cryogenics, large helium liquifiers, energy-conserving transmission, space experiments, ion engines, automatic drafting and reading machines

**Accelerator parts, vacuum devices, machinery manufacturing**
- High purity metal, ceramics material supplies
- High power, high freq. energy source, high freq. waveguide, maintenance, high freq. equipment manufacturer
- Beam monitor, radiation monitors Measuring instrument manufactures
- Tunnel construction, vibration control Public works construction

**Beam accelleration control devices**
- Coincidence device manufacturer

**Principle accel. system manufacturer**
- Heavy electronics, machinery manufacturer

**Electromagnets, electromagnetic power supply**
- Parts manufacure

**Processing detector data**
- Calculator manufacturer

**Cutting edge technology and related industries used with accelerators**

Photos provided by KEK website
**Efforts**

**A. Efforts Already Being Implemented** *(To be enhanced and strengthened)*

<table>
<thead>
<tr>
<th>Effort</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support increased competitiveness for local businesses</td>
<td>• Support increased efficiency, product quality and diversification for local businesses. Further increase local business' readiness to work with the ILC.</td>
</tr>
</tbody>
</table>

**B. Efforts to be Implemented at an Early Stage**

<table>
<thead>
<tr>
<th>Effort</th>
<th>Explanation</th>
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</thead>
<tbody>
<tr>
<td>Enhance cooperation between industry, academia and government and creation of information sharing network</td>
<td>• Enhance cooperation between industry, academic and government, including KEK, Tohoku University, Iwate University, Iwate Prefectural University, Iwate Prefecture, Iwate Industrial Research Institute, and Iwate Industry Promotion Center. Create a system so local businesses can share the necessary technologies for the ILC.</td>
</tr>
<tr>
<td>Support training for local businesses</td>
<td>• Encourage training for businesses within Oshu including foreign language learning.</td>
</tr>
</tbody>
</table>
| Create innovation hub | • Designate the area around Mizusawa-Esashi shinkansen station as innovation hub.  
• Consider implementation system and formulate plan for creating hub, consider organization style (public, public community trust, etc.).  
• Move forward with creation of hub (including infrastructure development, land development, etc.). |
| Attract satellite campus | • Attract a university satellite campus. Strengthen pre-existing businesses and venture companies, and secure capable human resources. |
| Promote concentration of accelerator-related industries | • Create new industrial park(s).  
• Set up incentive systems for taxes, etc. to attract businesses.  
• Work to attract and promote concentration/industrial clusters for all kinds of accelerator-related industries including medical accelerators.  
• Develop and foster other industries, including accelerator maintenance. |
| Set up consortium for businesses to enter ILC construction market | • Set up and support business consortium to establish a cooperative network between businesses to get involved with ILC construction. |

**C. Efforts to Implement by When ILC Starts Operation**

<table>
<thead>
<tr>
<th>Effort</th>
<th>Explanation</th>
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</thead>
</table>
| Establish a multifunctional innovation center | • Establish an industrial innovation center at innovation hub near Mizusawa-Esashi shinkansen station (jointly established, partially functioning as ILC facility).  
• Innovation center to partially function as university/research institution and tour facility, equipped with conference rooms, etc., with research and development facilities and offices for rent (consider measures to promote rental such as adjusting fees). |
| Attract accelerator research facilities | • Attract other accelerator research facilities besides the ILC that can be used for various research purposes. |
| Create new ILC-related curriculum at Industrial Technology Junior College | • Request that Mizusawa Industrial Technology Junior College create new curriculum related to the ILC such as photonics, accelerator technology, 3D CAD and ICF skills. |
II Promote Agriculture and Forestry using Oshu’s Resources

- Promote agriculture and forestry making good use of local strengths
  - Promote industry by increasing productivity for agriculture and forestry, which hold latent competitive potential.
  - Make an Oshu city that’s delicious and enjoyable for both residents and visitors.

» Expected Benefits
  - Expand 1st sector industry utilizing Oshu’s special qualities.
  - Strengthen network for eating local agricultural products that supports safe and trustworthy food.
  - New opportunities to promote our area’s outstanding culinary culture and products to the world.
  - Promote 6th sector diversification: link agriculture and forestry and medical care/welfare, child-raising, education, the environment and tourism.

Making a Delicious Oshu

- Local consumers eat locally and incorporate Oshu’s culinary culture that is rich, safe and environmentally friendly into their lives.
- Keeping Culinary Traditions
- Fresh, Affordable
- Safe
- Added Value to Ingredients
- Processed Goods
- New Brands
- Outside Consumers
- Tourism
- Education
- Childcare
- Welfare
- Medical Care

Reinvigorate 1st Sector Industry

- Green Energy
- Fun Farming, Forestry
- Train Workers
- Sustainable Local Production
- Use Local Industry
- Wood Biomass
- New Agriculture, Forestry Industries
- Use Local Materials for ILC Buildings

Use stimulus of innovation hub for 1st sector industry to proactively create new agricultural, livestock, forestry industries. Use Oshu’s resources as much as possible, working with local business to increase demand.

Reinvigorate 1st Sector Industry for the Future

A rich culinary life enriches every other part of life in Oshu.
**Efforts**

**A. Efforts Already Being Implemented** (To be enhanced and strengthened)

<table>
<thead>
<tr>
<th>Effort</th>
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</thead>
<tbody>
<tr>
<td>Promote and increase production of high-quality agricultural and livestock products</td>
<td>• Promote high-quality agricultural products. Increase number of agricultural and livestock products that can be a point of pride within Japan and overseas by promoting sixth sector diversification and enhancing the agricultural infrastructure.</td>
</tr>
</tbody>
</table>

**B. Efforts to be Implemented at an Early Stage**

<table>
<thead>
<tr>
<th>Effort</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider agricultural products for overseas markets</td>
<td>• Research culinary cultures, how to raise and make processed foods for agricultural products popular overseas to develop new Oshu products. Link these products to new overseas markets and sales promotion.</td>
</tr>
</tbody>
</table>

**C. Efforts to Implement by When ILC Starts Operation**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Enhance farmer’s market facilities, etc.</td>
<td>• Open farmer’s market shop and locally run restaurant within ILC facilities to promote local cuisine, products and traditional craftworks to the world. • Support research on producing and selling agricultural products from overseas. Promote foreign language translation for farmer’s markets, etc.</td>
</tr>
<tr>
<td>Designate an agriculture and exchange model area</td>
<td>• Designate and support an agricultural pilot project where international researchers and others can experience farming and be provided housing and agricultural/gardening land.</td>
</tr>
</tbody>
</table>
Sustainable City Planning Leading to the Future

While protecting and passing on Oshu's rich nature and traditional culture to future generations, we will be flexible enough to incorporate new environmental technologies and experimental efforts, providing a sustainable lifestyle harmonizing with nature.

- **Expected Benefits**
  - Switch from development-style city planning to planning that harmonizes with the environment.
  - Make a network that creates and consumes energy locally in cooperation with surrounding municipalities.
  - Form a sustainable society together with industry that recycles, and conserves energy and resources through new technologies.

- **Efforts**

  **B. Efforts to be Implemented at an Early Stage**

<table>
<thead>
<tr>
<th>Effort</th>
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</thead>
<tbody>
<tr>
<td>Promote use of local</td>
<td>• Increase logging and transport efficiency. Work to strengthen supply system for city's products.</td>
</tr>
<tr>
<td>products</td>
<td>• Promote active use of lumber from within the city, as well as from nearby areas (for housing, multistory buildings).</td>
</tr>
<tr>
<td></td>
<td>• To minimize costs and CO2 emissions, propose use of materials within Iwate prefecture for ILC facilities.</td>
</tr>
</tbody>
</table>

  **C. Efforts to Implement by When ILC Starts Operation**

<table>
<thead>
<tr>
<th>Effort</th>
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</thead>
<tbody>
<tr>
<td>Create energy system</td>
<td>• Create wood biomass energy system.</td>
</tr>
<tr>
<td>utilizing waste heat from</td>
<td>• Utilize waste heat for hothouses (facilities for growing vegetables, flowers, etc.) and bathing facilities.</td>
</tr>
<tr>
<td>the ILC</td>
<td></td>
</tr>
</tbody>
</table>
Create Spaces, Experiences Attracting People from All over the World Using What Makes Oshu Special

Through reevaluating Oshu’s resources and creating new assets, we will provide diverse experiences and services: from nature to culture, and from tradition to cutting edge technology.

Expected Benefits

- Revitalize tourism that uses Oshu’s resources.
- Develop tourist routes and promote area in collaboration with surrounding municipalities.
- Develop green tourism to provide experience of living among nature in Oshu.
- Develop science tourism and culture tourism, where traditional culture and cutting edge technology co-exist.
- Enhance information network so that information can be shared with the world from anywhere within the city.
- Provide various kinds of restaurants and lodging facilities and create information network.
### Efforts

#### A. Efforts Already Being Implemented  (To be enhanced and strengthened)

<table>
<thead>
<tr>
<th>Effort</th>
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</tr>
</thead>
</table>
| Provide foreign language information on tourism, traditional culture | ・Create “Oshu for You” videos introducing tourist attractions and culture from the perspective of international residents.  
 ・Collaborate with Oshu International Relations Association to also use community radio, etc. to provide information. |
| Prepare free Wi-Fi spots                     | ・Collaborate with private sector to prepare free Wi-Fi spots in Oshu’s lodging facilities, sightseeing spots, public facilities and ILC-related facilities. |

#### B. Efforts to be Implemented at an Early Stage

<table>
<thead>
<tr>
<th>Effort</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promote Wi-Fi spots</td>
<td>・Also add Wi-Fi spots within the city in cafes, etc. Show Wi-Fi spots on Oshu’s website and tourist maps.</td>
</tr>
</tbody>
</table>
| Prepare for receiving more visitors from abroad | ・Prepare multilingual tourism portal website.  
 ・Unearth and promote tourist resources within Oshu city as seen from international perspectives.  
 ・Support foreign language learning for workers within Oshu city.  
 ・Consider new festivals and events that visitors from abroad can enjoy. |
| Develop wide area sightseeing course         | ・Develop sightseeing course over a wide area including Hiraizumi, Matsushima and Sendai.                                                  |
| Develop city plan for experiential, educational sightseeing | ・Create a city plan for experiential and educational sightseeing such as green tourism and working holidays.  
 ・Develop sightseeing plan for experiencing Japan’s unique culture, such as local performing arts and zen (meditation). |
| Provide foreign language public transportation information | ・Collaborate with private public transportation facilities to provide information making transportation easier to use, such as bus route status, multilingual on-board announcements, and videos showing how to pay fare. |
| Increase Hanamaki Airport’s convenience    | ・Increase the convenience of using Hanamaki Airport as the gateway for the world to come to the ILC (new connections to Narita and Haneda, new routes to Europe and North America in cooperation with Chitose Airport). |
| Horse boarding and riding project           | ・Implement horse boarding and riding project combining horse-riding, which is beloved by western people, and the long history this area has as a leading producer of horses. |
| Develop outdoor sports resources            | ・Promote and develop outdoor spots resources (mountain climbing, cycling, rock-climbing, canoeing, paragliding, jet skiing, etc.). |

#### C. Efforts to be Implemented by When ILC Starts Operation

<table>
<thead>
<tr>
<th>Effort</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Train ILC interpretive guides</td>
<td>・Train ILC interpretive guides.</td>
</tr>
<tr>
<td>Establish multifunctional innovation center</td>
<td>・Add tourism-related components (small theater, dioramas, displays) to the innovation center built near Mizusawa-Esashi shinkansen station. Make use of center for ILC science tourism and tourism to coastal areas.</td>
</tr>
<tr>
<td>Formulate convenient public transportation system</td>
<td>・Establish a public transportation system between places including Mizusawa local station, Mizusawa-Esashi shinkansen station, research facilities, and tourist attractions within Oshu. (More frequent prefectural and city buses, expanded railway, free shuttle buses).</td>
</tr>
<tr>
<td>Use open store space to create international restaurant area</td>
<td>・Use vacant stores around Mizusawa local train station, etc. to create an international restaurant area.</td>
</tr>
</tbody>
</table>
2) Action Guidelines to Promote a Multicultural Society and a Comfortable, Improved Living Environment

IV So All Kinds of People Can Live with Peace of Mind and in Comfort

■ City Development for Living With Peace of Mind and in Comfort
  ○ Provide continuous support so that anyone—people who want to learn, who want to work, who want to raise children—can live in the way they want.
  ○ Form a society that achieves work-life balance.
  ○ Provide complete welfare and medical care support services so that anyone can live here with peace of mind.

▶ Expected Benefits
  • Switch from lifestyle regulation city planning to lifestyle support city planning.
  • Create work opportunities including both new traditional jobs as well as other various forms of work such as work-sharing.
  • Provide a medical care (preventative medicine and advanced medical care) service network easy for anyone to use.
◆ Efforts

## A. Efforts Already Being Implemented  (To be enhanced and strengthened)

<table>
<thead>
<tr>
<th>Effort</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide information on everyday customs</td>
<td>• Create a Q &amp; A summarizing everyday customs in Japan, etc.</td>
</tr>
<tr>
<td>Support international residents at medical facilities</td>
<td>• Enhance Oshu International Relations Association medical interpreter dispatch system.</td>
</tr>
<tr>
<td></td>
<td>• Create and distribute information (list) on medical facilities that can provide care in foreign languages.</td>
</tr>
<tr>
<td></td>
<td>• Translate application forms, etc. into foreign languages.</td>
</tr>
<tr>
<td></td>
<td>• Create point and speak communication sheets for reception.</td>
</tr>
</tbody>
</table>

## B. Efforts to be Implemented at an Early Stage

<table>
<thead>
<tr>
<th>Effort</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create one stop service desk for international residents</td>
<td>• Create one-stop service desk so international residents can consult about various issues.</td>
</tr>
<tr>
<td>Support medical services for international residents</td>
<td>• Multilingual signage for drug stores, English explanations of medicine prescriptions, etc.</td>
</tr>
<tr>
<td></td>
<td>• Introduce three-way phone call interpretation system for 119 (emergency phone number for fire brigade and medical services) with English language interpreters.</td>
</tr>
<tr>
<td></td>
<td>• Promote multilingual medical services making full use of technology (include foreign languages in hospital websites, installing multilingual digital signage).</td>
</tr>
<tr>
<td></td>
<td>• Educate doctors and nurses on treating international residents.</td>
</tr>
<tr>
<td>Enhance &quot;foreign mothers community club&quot;</td>
<td>• Enhance activities for international mothers to get to know each other, and further develop Japanese cultural activities.</td>
</tr>
<tr>
<td>Enhance child raising support services</td>
<td>• Work to bring in more private childcare businesses.</td>
</tr>
<tr>
<td></td>
<td>• Form temporary childcare (babysitting) system easy for both Japanese and international residents to use.</td>
</tr>
<tr>
<td>Build a new city hospital</td>
<td>• Make new hospital to replace the aging Mizusawa Hospital an easy to use facility for international residents.</td>
</tr>
</tbody>
</table>

## C. Efforts to Implement by When ILC Starts Operation

<table>
<thead>
<tr>
<th>Effort</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support employment of international medical staff</td>
<td>• Consider receiving foreign nurses through Economic Partnership Agreements (EPA).</td>
</tr>
<tr>
<td>Support international resident's families</td>
<td>• Promote international residents’ registration in family support programming. Help create opportunities for researchers' spouses to be active.</td>
</tr>
</tbody>
</table>
City Development for the Future (City Development for Population Loss, Aging Society)

- Build a base living services network at the neighborhood (community center) level.
- Promote effective city management through cooperation between citizens and government that transcends area boundaries.

▶ Expected Benefits

- Move towards sustainable city development, where anyone can live comfortably.
- New transportation system stemming from a partnership beyond citizen/government boundaries that uses ICT and other tools and fits peoples’ everyday activities.
## Efforts

### A. Efforts Already Being Implemented (To be enhanced and strengthened)

<table>
<thead>
<tr>
<th>Effort</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| Provide information in foreign languages using various kinds of media | - So that international residents of Oshu city can live their lives safely and with peace of mind, provide information in foreign languages on Oshu city website, emergency email service and social media, including disaster safety maps, evacuation orders and disaster information.  
  - Collaborate with Oshu International Relations Association to also use community radio, etc. to provide information. |

### B. Efforts to be Implemented at an Early Stage

<table>
<thead>
<tr>
<th>Effort</th>
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</thead>
<tbody>
<tr>
<td>Providing information in foreign languages using local cable television, etc.</td>
<td>- Broadcast local foreign language programs using local cable television, the internet, etc.</td>
</tr>
<tr>
<td>Give foreign language information on public transportation</td>
<td>- Collaborate with transportation companies to provide information such as bus route status, multilingual on-board announcements, and videos showing how to pay fare, making transportation easier to use.</td>
</tr>
<tr>
<td>Establish transportation system to connect a wide area including mountainous areas</td>
<td>- Create a reservation system using IT tools so that transportation systems such as public transportation (on-demand taxis), carpooling (ridesharing) and car sharing can be used by residents according to their needs.</td>
</tr>
</tbody>
</table>

### C. Efforts to Implement by When ILC Starts Operation

<table>
<thead>
<tr>
<th>Effort</th>
<th>Explanation</th>
</tr>
</thead>
</table>
| Create convenient public transportation system)                                             | - Establish a public transportation system between places including Mizusawa local train station, Mizusawa-Esashi shinkansen station, research facilities, and tourist attractions within Oshu.  
  (More frequent prefectural and city buses, expanded railway, free shuttle buses). |
V Where Various Cultures Comingle and We Feel Pride in Our Area

- City Development Open to the World and Other Areas
  - Prepare an environment, systems to proactively bring in new and returning residents, youth and senior citizens, etc.
  - Bring in more residents and increase populations through providing high quality childcare and educational environment and creating more jobs.

▶ Expected Benefits
  - Create a living environment with lots of nature and well-developed living services that makes people want to move here.
  - Prepare area to receive new residents and long-term visitors from outside this area including ILC researchers.
  - Prepare area to receive new and returning residents moving out of cities to the country, such as young people and senior citizens.
  - Create a residential network between areas to provide living experiences both in the city and in the country.
  - Expand “akiya bank” (unused house listing) system to provide a stock of empty housing to new and returning residents.

An Oshu That Attracts People

- Students enter schools, youth get jobs in Oshu
- Innovation hub, attracting factories, revitalize 1st sector, etc.
- Job creation
- High quality educational, play environment
- Promote residency, population increase
- Business workers, researchers and engineers (including from overseas)
- Well-rounded childcare, medical, welfare, caregiving environment
- Senior citizens move in with caregivers

Innovation hub, attracting factories, revitalize 1st sector, etc.
**Efforts**

**B. Efforts to be Implemented at an Early Stage**

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>Support incoming and new long-term residents</td>
<td>・Develop well-rounded site for incoming and new long-term residents, providing multilingual information introducing properties and stories from newer residents. Provide support for rental agreements, prepare “test residency” facilities, give city subsidies for rent and building earthquake resistance improvement, create a remodeling subsidy system for new long-term residents, and work to strengthen consultation services for becoming a resident.</td>
</tr>
<tr>
<td></td>
<td>・Hold tours to attract new residents using empty homes and housing for new long-term residents.</td>
</tr>
</tbody>
</table>

**City Development for a Multicultural Society and a Comfortable Life**

○ Propose a new “Oshu way of life” that integrates incoming world cultures while preserving the culture and natural features that have been cultivated in Oshu.

**Expected Benefits**

- City planning that uses what is great about Oshu: its traditions and uniqueness.
- More interaction between people of all ages through a way of life that harmonizes with nature.
- Make an environment where people of various nationalities and with different value systems can live safely and comfortably.
- Make an environment where anyone can easily get local information and receive living services.
◆ **Efforts**

### A. Efforts Already Being Implemented (To be enhanced and strengthened)

<table>
<thead>
<tr>
<th>Effort</th>
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</tr>
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</table>
| Translate local government and living information into foreign languages | - Collaborate with Oshu International Relations Association and government bodies such as Iwate Prefecture and Japanese government to add multilingual information to Oshu city website, signage in city buildings, and tourism pamphlets so that international visitors and residents can get the information they need from the local government wherever and whenever they want.  
- Promote multilingual signage and materials in stores, businesses, etc. to make a comfortable living environment for international residents. |

### B. Efforts to be Implemented at an Early Stage

<table>
<thead>
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<tbody>
<tr>
<td>Translate local information (culture, history) into foreign languages</td>
<td>- Promote conveying multilingual information on local history and traditional culture as well.</td>
</tr>
<tr>
<td>Globalize local clubs</td>
<td>- Stimulate participation by international residents by using Oshu city website and social networking services to provide information on local events and club activities.</td>
</tr>
<tr>
<td>Living support with mutual acceptance of local diversity</td>
<td>- Create system of volunteers to support international residents in their lives, positioning this system as an important measure for Oshu City.</td>
</tr>
<tr>
<td>Start Oshu Dream Platform (provisional title)</td>
<td>- To find quick solutions for issues stemming from Japanese and international residents living together, as well as to unearth special local features, create a platform for local government and local representatives, etc. to work together to better understand the whole picture, share issues and consider concrete solutions.</td>
</tr>
</tbody>
</table>
| International "Taste of Oshu" | - Promote a diverse culinary culture and create new business chances by holding lectures, etc. for those running dining establishments.  
- Proactively call for international residents to participate in events having to do with food, promoting mutual exchange.  
- Collaborate with organizations such as private businesses and universities to consider ways to combine local ingredients with culinary culture from overseas. |

### C. Efforts to Implement by When ILC Starts Operation

<table>
<thead>
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</thead>
</table>
| Provide places for spouses of international researchers to be active | - Hire spouses in public schools as assistant language teachers, club coaches, assistants for international students.  
- Hold foreign language conversation classes. |
3) Action Guidelines to Become an International Education City and Educate the Next Generation

VI Educating People to Excel on the World Stage

- Create a world leading educational city that produces many great young people. By interacting with the cutting-edge technology and researchers of the ILC these young people will receive an internationally-minded education and excel on the world stage.
- Become a city of lifelong learning, where anyone living in Oshu, from children to senior citizens, can improve themselves through enjoying high-quality education and diverse experiences.

(Expected Benefits)

- Provide the opportunity to learn and experience new things in various ways in an environment with diverse cultures and values intermingling together.
- Train and utilize human resources who can act as leaders in various fields and positions.
- Provide educational opportunities through partnerships between the ILC and educational bodies.
- Take in ILC “exchange students” from other areas of Japan.

Raise Workers Who Can Excel in a Global Society

Elementary, junior high school level: City development that nurtures our future

Higher education: Produce many innovators

Social education: Form a collaborative society Train local leaders

Infants and preschool: A superior child-rearing environment

Spaces for children Create spaces for play

Diverse experiences for children Varied play life

City planning for living comfortably, with peace of mind

City planning where various cultures come mingle and we can feel proud of our area

City planning for living comfortably, with peace of mind

City planning where various cultures come mingle and we can feel proud of our area

City planning for living comfortably, with peace of mind

City planning where various cultures come mingle and we can feel proud of our area
**Efforts**

<table>
<thead>
<tr>
<th>A. Efforts Already Being Implemented (To be enhanced and strengthened)</th>
</tr>
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<tbody>
<tr>
<td><strong>Effort</strong></td>
</tr>
</tbody>
</table>
| Promote scientific education efforts making use of NAOJ Mizusawa Campus | • Guest lessons for elementary and middle schoolers by NAOJ Mizusawa staff.  
• Proactively hold open days for NAOJ facilities. |
| Science experience education | • Hold science experience activities and science career camps/science camps to heighten interest in science for elementary and middle schoolers, the leaders of the next generation. |
| Promote local education and train educators | • Further strengthen education about this area, so that children can learn about Oshu’s history and culture, and by understanding the culture they grew up in, better understand themselves and others.  
• Train educators to teach about and promote mutual understanding of local culture. |

<table>
<thead>
<tr>
<th>B. Efforts to be Implemented at an Early Stage</th>
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</thead>
<tbody>
<tr>
<td><strong>Effort</strong></td>
</tr>
<tr>
<td>Attract university satellite campuses(es)/university research facility(ies)</td>
</tr>
</tbody>
</table>
| Create an environment where we can learn from scientists | • Conduct training for educators to enhance science education.  
• Hold science talks so anyone in Oshu can learn from scientists. |
| Promote English education for young students | • Promote English education through English speech contests and English camps for elementary and/or middle school students. |
| Promote English language education for adults | • “Domestic study abroad,” homestays for Japanese people at researchers’ homes.  
• Conduct business foreign language lectures for service workers. |
| Educate children to understand different cultures and develop global awareness | • So that children can learn about different cultures outside Japan and develop global awareness, implement a “tera-koya” program (highly regarded extracurricular educational program for children held at local temples) with international residents as instructors. |

<table>
<thead>
<tr>
<th>C. Efforts to Implement by When ILC Starts Operation</th>
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</thead>
<tbody>
<tr>
<td><strong>Effort</strong></td>
</tr>
<tr>
<td>Strengthen specialized education in high schools</td>
</tr>
</tbody>
</table>
| Establish system for international students (Public schools, international school) | • Establish a system for accepting international students in public school: create international class and assign language instructors.  
• Hire specialized board of education staff for duties including developing and translating foreign language educational materials.  
• Consider how to attract an international school. |
| Implement educational program with ILC | • Implement school educational programs and lifelong learning educational programs in cooperation with the ILC.  
• Conduct field trip programs in ILC facilities. |
5 Conclusion

In forming this ILC City Development Vision, we placed the most importance not on what the ILC will do to this area, but in what ways we can link our hopes and dreams to the ILC.

Through the ILC’s construction in this area, many researchers will gather here and many people from overseas will come to live together with us.

The ILC also holds a great deal of potential, like similar facilities throughout the world, and its results will affect not only fundamental physics, but will also affect various fields including medical care, control systems, detectors and analysis, bringing about many business opportunities.

It will further enable us to put together a very high-quality educational curriculum for people of all ages, from children to adults.

In this way, the ILC will have a very large impact on our lives.

However, how we will meet this ILC is up to each one of us. To people who think “I don’t know the specifics, but a cutting-edge international research facility is going to be built, and many researchers and people from other countries will come here, so I want to learn more!” the ILC will provide infinite possibilities.

Our hope is that we can use the ILC as one of many opportunities, and, while feeling pride in our area and happiness that we can live here, make a vibrant community together with our new neighbors.