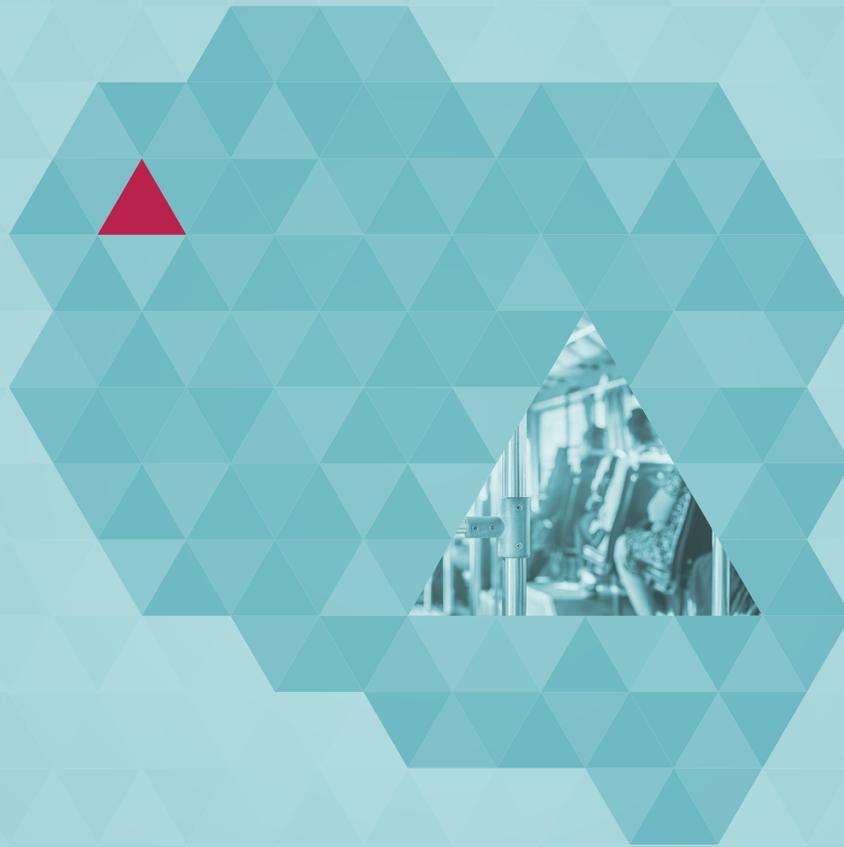


# POLAND CATCHING-UP REGIONS 3

## RURAL PUBLIC TRANSPORT IN ZACHODNIOPOMORSKIE



# POLAND CATCHING-UP REGIONS



## RURAL PUBLIC TRANSPORT IN ZACHODNIOPOMORSKIE



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# CURRENCY EQUIVALENTS

(Exchange Rates Effective May 29, 2019)

Currency Unit = Polish Złoty

PLN 4.3 = EUR 1

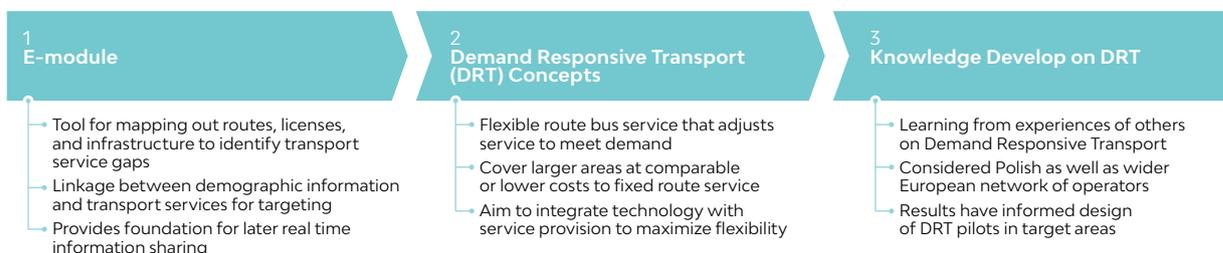
# ACRONYMS AND ABBREVIATIONS

<b>CFZ</b>	Central Functional Zone
<b>DRT</b>	Demand Responsive Transport
<b>EU</b>	European Union
<b>EU-SILC</b>	European Union – Statistics on Income and Living Conditions
<b>EUR</b>	Euro
<b>GBP</b>	British Pounds Stirling
<b>GIS</b>	Geographic Information System
<b>GTFS</b>	General Transport Feed Specification
<b>JASPERS</b>	Joint Assistance to Support Projects in European Regions
<b>MoF</b>	Ministry of Finance
<b>MoI</b>	Ministerstwo Infrastruktury (Ministry of Infrastructure)
<b>MPK</b>	Miejskie Przedsiębiorstwo Komunikacyjne S.A. w Krakowie (Municipal Transport Company of Krakow)
<b>PKS</b>	Przedsiębiorstwo Komunikacji Samochodowej (Motor Transport Company)
<b>PLN</b>	Polish złoty
<b>PSC</b>	Public Service Contract
<b>SDG</b>	Sustainable Development Goals
<b>UK</b>	United Kingdom
<b>ZDiTM</b>	Zarząd Drógi Transportu Miejskiego Road and Urban Transport Authority (Szczecin)

# EXECUTIVE SUMMARY

**The CUR3 Transport Component focused on three immediate opportunities for tackling rural transport challenges in Zachodniopomorskie.** The first level of opportunity was to provide the Marshal Office, powiats, Gminy, and the National Government of Poland with usable information to support planning. This was pursued under an activity to centralize information on current public transport in an online tool called an “e-module.” The second level of opportunity was to develop the best possible interventions to improve rural transport access that can align with Poland’s current legal framework. This was pursued under an activity to develop six Demand Responsive Transport pilots that address gaps in existing services. The third level of opportunity was to capture learning around the solutions that can improve access to rural public transport with a view to enhancing the likelihood of future success from interventions. This was pursued through a structured program of knowledge exchange with operators of Demand Responsive Transport systems. Activities under the Catching Up 3 transport component focused on four target areas of Zachodniopomorskie, including: (i) powiat drawski; (ii) powiat lobeski; (iii) powiat świdwiński; and (iv) powiat kamieński (hereafter the “Target Areas”). The results achieved for each activity are summarized below.

**FIGURE 1 Results of the CUR3 Transport Component:**



**Strategic observations from the Catching Up Regions 3 work in Zachodniopomorskie relate to (i) gaps in Poland’s national legal framework; (ii) opportunities for improving services within the current legal framework; and (iii) the pressing need for action to improve access to rural public transport.** Specifically, there is a need for Poland’s national government to adjust the current legal framework for rural public transport to move beyond a commercially-focused model aimed at minimising fiscal costs to one that targets efficiencies through comprehensive network management and achieves socially beneficial levels of access. Development of specific funding mechanisms beyond current reimbursement of concessional fares is a foremost priority along with greater legal flexibility around the use of new technologies. However, despite the limitations of Poland’s current model, there are immediate opportunities for action to improve access - such as the Demand Responsive Transport (DRT) program described in this report. DRT has been demonstrated in two Polish cities and has been used effectively in other EU member states as a rural transport solution for low population density areas (including UK, Germany, Finland, Sweden, Ireland, Austria, and Greece). Most importantly, available statistical indicators suggest that improving rural transport is critical component of Poland’s rural development.

The needs of women and segments of society that do not have access to private mobility or have mobility impediments of some form stand out. Local governments need to look towards immediate action to improve access, despite legal and institutional limitations that do indeed exist.

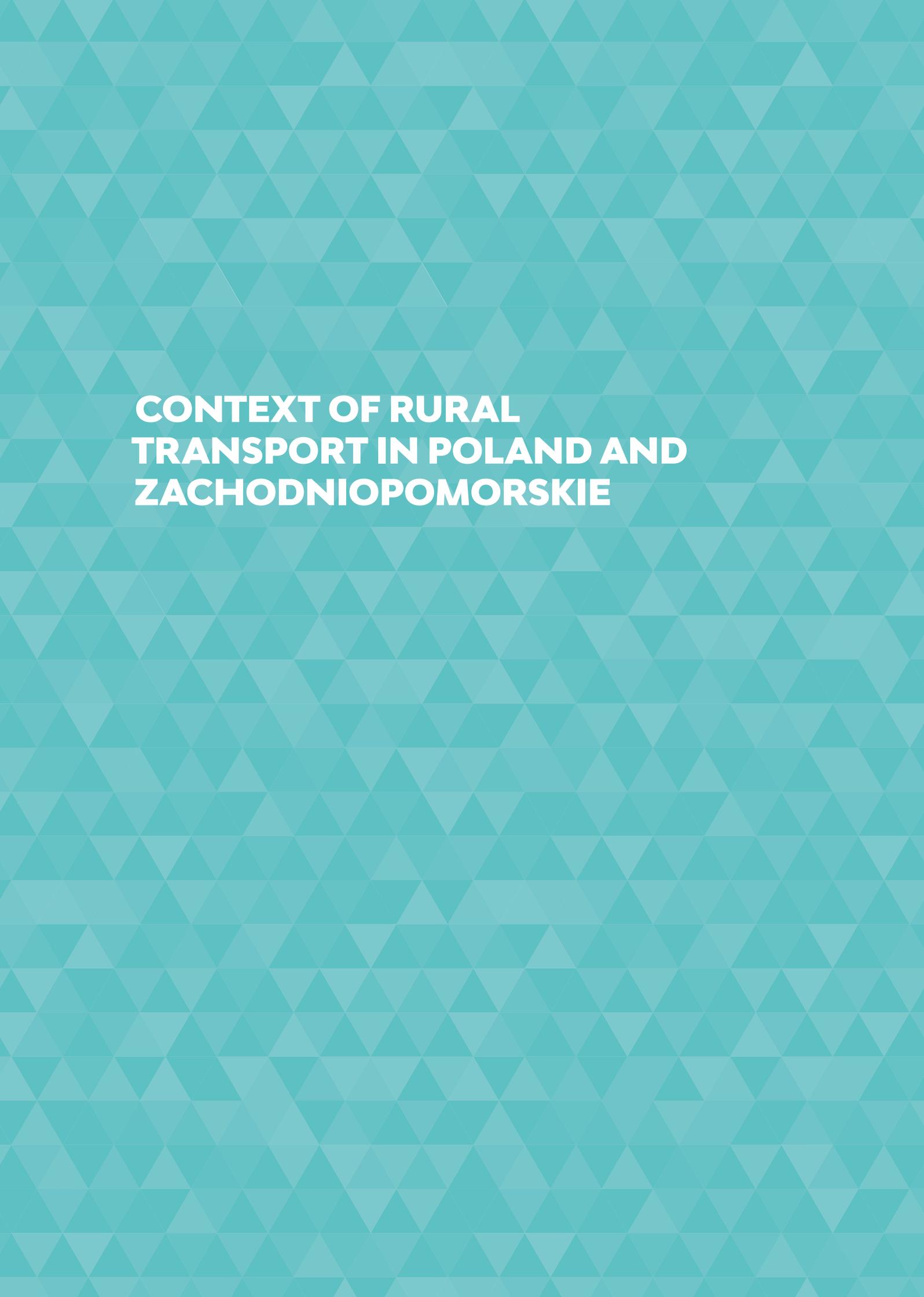
**Next steps envisaged for improving rural transport in Zachodniopomorskie include: (i) expansion of the e-module beyond target areas; (ii) mobilization of DRT pilots; and (iii) mobilization of communications programs and knowledge capture around DRT pilots.** This report includes a proposed work program for next steps with an indicative action plan for the next 18 months. This is estimated to cost approximately EUR 320,000-370,000 and would require continuation of the Catching Up Regions 3 transport component, mobilization of JASPERS technical assistance, and engagement of additional consultancy resources under the Regional Operational Program to implement a communications initiative for supporting mobilization of proposed DRT pilots.

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# **POLAND'S DEVELOPMENT AND THOSE BEING LEFT BEHIND**

**Poland has reached high-income status and demonstrated a development trajectory for other countries to follow.** Few middle-income countries have witnessed such consistent broad-based growth that has been both fast and stable. Between Poland's EU accession in 2004 and 2016 GDP growth averaged 3.97% per annum. In 2004 an estimated 10.1% of Poland's population was considered poor according to a US\$5.50 per day (2011 PPP) benchmark. That number fell to approximately 2.1% of the population in 2016. Poland's transition has benefited from a consistent set of policies that promoted productivity increases, sound macroeconomic management, strengthening of institutions, investment in human capital, and leveraging of European Union membership. Growth has also had a positive impact on shared prosperity, as the per capita consumption of the bottom 40 percent grew at an annualized rate of 0.7 percent between 2009 and 2014 which was slightly faster than the average for the total population. In the specific case of transport, Poland is achieving remarkable development of its road network. DG MOVE's EU Transport Scorecard shows that as of 2016 Poland had completed upgrades or new development of 62% of its TEN-T core road network.

**However, Poland's development path remains incomplete – especially in the face of an aging population and inequality.** Poland is the fastest aging society in Europe. An estimated 35% of the population will be over 65 by 2030. As Poland's overall income level has continued to converge with EU averages, it is increasingly necessary to target inequality. Within Poland there are significant economic disparities between regions and within local communities. Some regions of Poland are among the 20 poorest in the European Union. Specifically, Poland's rural areas are places that need to catch up economically. For example, Statistics Poland's "*Rural areas in Poland in 2016*" report noted that in rural areas every fourth household was below the national poverty line versus every tenth household in urban areas. This same report noted that there were 1.3 million people (8.5% of the rural population) who benefited from social assistance in rural areas, which accounted over than half of social welfare beneficiaries in all of Poland. The nature of unemployment captured in Statistics Poland's data also shows that every fourth unemployed person in rural areas was without work for more than 24 months. Continuing Poland's positive development trajectory requires solutions for bringing the benefits of growth to rural areas in particular.

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# **CONTEXT OF RURAL TRANSPORT IN POLAND AND ZACHODNIOPOMORSKIE**

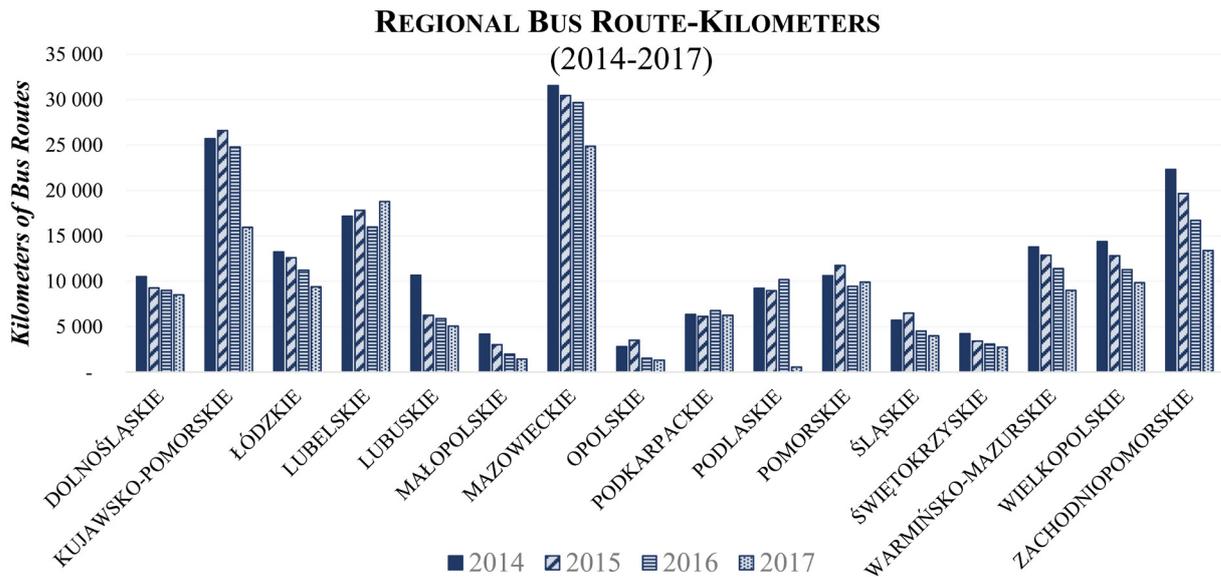
## SCOPE, SCALE, AND NATURE OF THE CHALLENGE

**Improving rural public transport in Poland is a large challenge with respect to geography and size of the intended beneficiary population.** Roughly 39.5% of Poland's Population lives in rural areas (about 15.2 million rural inhabitants). Approximately 93% of the 312,700 km<sup>2</sup> that comprise Poland are considered rural. The physical scale of Poland's rural areas alone are about 3.5 times the size of Austria. The number of people living in rural Poland is roughly twice the population living in greater London. Zachodniopomorskie's context resembles Poland's overall characteristics. Approximately 94% of the Voivodeship's area is considered rural (21,444 km<sup>2</sup>) and is home to an estimated 535,319 people (31% of the population). This is roughly equivalent to the population of Luxembourg dispersed over an area 8 times the size of Luxembourg. Relative to other Voivodeships, Zachodniopomorskie is tied for the second lowest average rural population density in Poland. Providing any form of network service across to this many people spread across such a wide area is inherently challenging. In rural Zachodniopomorskie and rural Poland in general those challenges are compounded by a licensing system for public transport that involves three tiers of government and relies on paper-based records such that information sharing and network planning across institutions is limited.

**The current network of rural public transport is commercially optimized but not socially optimized and commercial constraints have forced reductions in access.** Poland's rural public transport network is characterized by three things: (i) service provision primarily along commercially viable routes that do not require government subsidy (beyond reimbursement of concessional fares); (ii) high levels of cost for customers that do not receive concessional fares relative to rural income levels and relative to urban public transport elsewhere in Poland; and (iii) low levels of service in areas that offer less commercially viable density of demand and lower ability to pay - in these areas public transport is often only provided for school transport as mandated under Polish law. Rural transport networks in Poland are contracting overall with particularly pronounced contractions in several voivodships (including Zachodniopomorskie). For example, between 2014 and 2017, the length of regional bus lines in Poland decreased by 30%. In Zachodniopomorskie over this same time period regional bus services decreased by 40%. This means that rural communities have been experiencing a decline in their level of access to public transport and the connectivity that it provides.

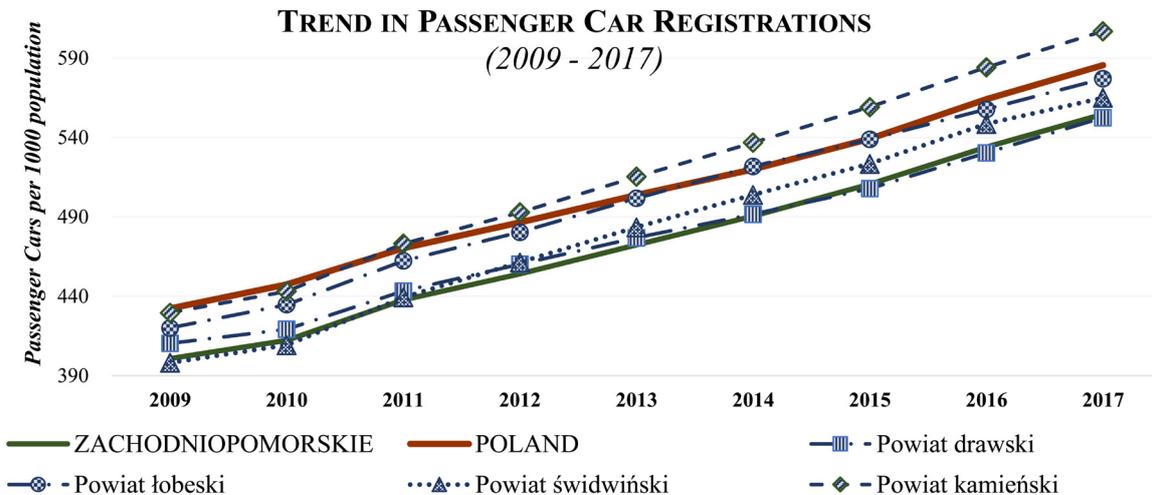
**Access to private motorized transport is increasing, but this is NOT inclusive access for all.** Between 2009 and 2017 the number of registered private cars in Zachodniopomorskie and the Target Areas increased broadly in line with Poland's overall national trend of increasing motorization. This may be a contributing factor for the decline in regional bus services as reduced demand for public transport may have increased commercial pressures on bus operators. While increasing access to private cars can enhance mobility in rural areas for some, it should not be confused with inclusive access for all segments of society given disparities in vehicle ownership. For example, the survey data from 2017 EU-SILC "Incomes and living conditions of the population of Poland- report" noted that while 76.3% of rural households in Poland reported owning at least one car, only 26% of Polish pensioners reported owning a car. Approximately 12.5% of pensioners reported not being able to afford a car and 61.5% reported not owning a car for other reasons.

**FIGURE 2** Shrinking network for rural public transport – example regional buses



Source: Central Statistical Office of Poland; Notes: (i) data includes lines operated by enterprises employing more than 9 persons; (ii) data excludes urban transport services; (iii) data were divided into voivodships on the basis of the location of the enterprise providing services

**FIGURE 3** Increasing access to private transport – but not for everyone

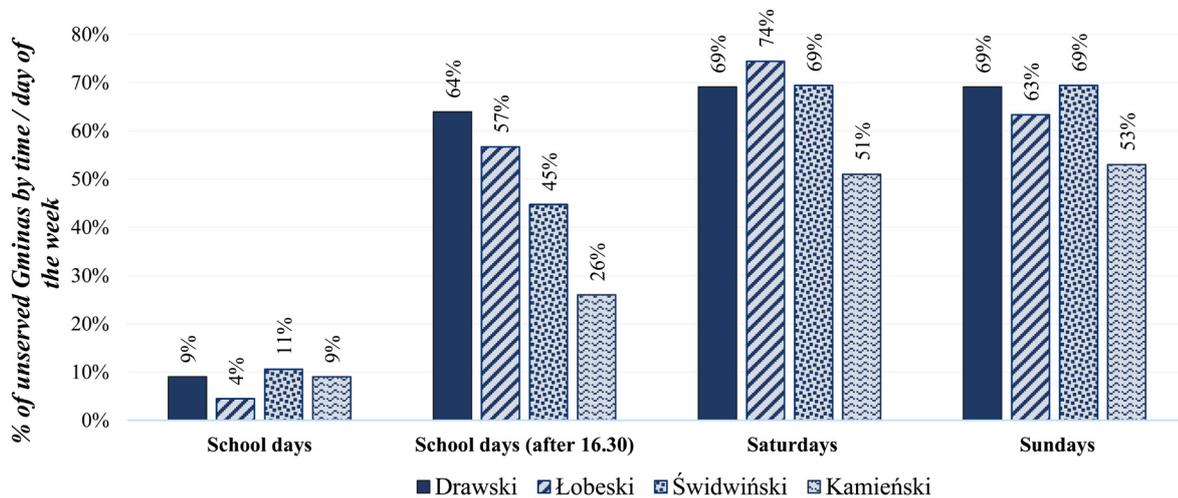


Source: World Bank analysis of data from Statistics Poland, Local Data Bank

**The foremost challenges are level of service and quality of service as very few gminy lack public transport services entirely.** Because of the legal mandate for providing school transport, there are relatively few gminy that are completely unserved by public transport during regular school days. For example, in the Target Areas of Zachodniopomorskie only 4%-11% of gminy lack any public transport service during normal school days (compared to 26% across Poland). However, when looking at services beyond 16:30 on a school day, weekend, or typical holiday, the number of unserved gminy greatly increases (e.g. 74% of gminy in powiat łobeski lack any service on Saturdays). The key learning from this analysis is that the primary opportunities for improving access exist on specific days and times of day when the current commercial models for delivering public transport services are failing to deliver. Specifically, this means weekends, early mornings, evenings after school hours, and holidays. Addressing gaps at these times is important

to serving the breadth of transport needs that rural populations likely have. Importantly, this also aligns with gaps that existing public transport operators have in their current use of rolling stock and human resources. The design of DRT pilots in Zachodniopomorskie were accordingly targeted at these gaps where they are also most likely to work alongside (rather in competition with) the existing market for public transport services.

**FIGURE 4** Significantly degraded public transport access in evenings and on weekends



Source: World Bank Analysis for DRT Pilots in Target Areas of Zachodniopomorskie

**Rural public transport is high cost but low quality.** The average monthly rural household income per capita in Poland is PLN 1,723 (EUR 400 equ.) from both cash and non-cash sources. What rural public transport in Poland does exist is expensive relative to this situation. For example, an “average” monthly rural bus pass for a 25 km journey in Zachodniopomorskie is approximately PLN 230 – 265 (about 13%-15% of average per capita household income). The proportion of households at risk of poverty in Poland’s rural areas was 21.5% after social transfers in 2017 which also implies that the average income figures do not represent the financial means of poor households with below average incomes. The combination of high costs and declining levels of rural transport access is contrary to Poland’s 2030 Agenda for Sustainable Development which targets inclusion of rural areas in support of achieving the Sustainable Development Goals (SDG).

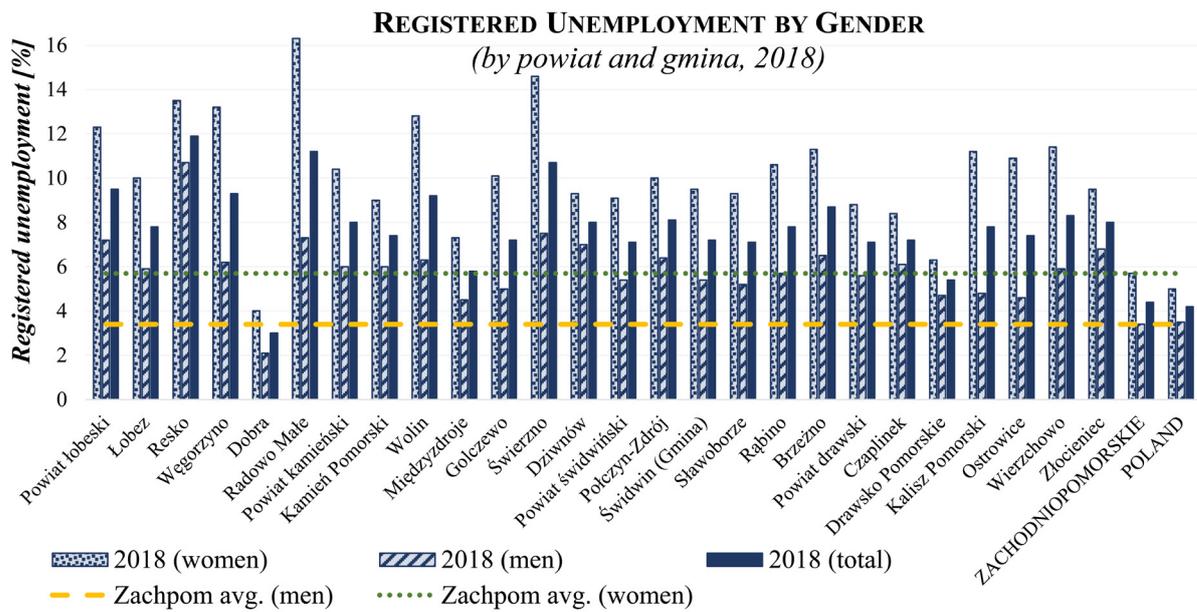
## WHY RURAL PUBLIC TRANSPORT MATTERS FOR POLAND’S DEVELOPMENT

**Poor public transport access has consequences beyond transport for people in rural Poland – particularly for vulnerable groups.** For example, survey data from 2017 EU-SILC “*Incomes and living conditions of the population of Poland – report*” noted that 6.4 % of rural respondents who reported unmet healthcare needs cited distance and no access to transport as the main cause of their inability to access healthcare (vs 2.7% for urban areas). That same figure was 9.3% for rural respondents who happened to have legally recognized disabilities. While comprehensive data on rural transport behaviors in Poland is not available, statistics such as these suggest that increasing levels of access to rural public transport can play an important role in enhancing social and economic welfare for Poland’s rural population – particularly amongst low income households and vulnerable groups.

**Unemployment in rural areas of Zachodniopomorskie suggests a need for improving access to economic opportunity – especially for women.** In 2018, the overall rate of registered unemployment in Zachodniopomorskie was 5.7% for women and 3.4% for men versus the national

average for Poland of 5% for women and 3.5% for men. However, deeper analysis into the data for individual gminy and powiats in the Target Areas shows two critical observations. Firstly, registered unemployment is considerably higher than regional or national average across both men and women (e.g. 16.3% for women and 7.3% for men in gmina radowo małe). Secondly, the disparity in registered unemployment between men and women is significantly greater than the average for Zachodniopomorskie in all but three gminas in the Target Areas. For example, there was a 10.7 percentage point difference in the rate of registered unemployment in between women and men in gmina Świerżno in 2018. While the full range of causal factors for gender related differences in registered unemployment is not fully understood, it is possible and perhaps likely that poor access to transport is a contributing factor.

**FIGURE 5** Unemployment – esp. amongst women is a challenge in rural Zachodniopomorskie



Source: World Bank analysis of data from Statistics Poland, Local Data Bank

## LEGAL AND INSTITUTIONAL FRAMEWORK

**Poland’s current legal framework for rural public transport is prescriptive in a way that misaligns with the services needed in rural areas - that needs to change.** Current Polish law has ambiguity around the use of technology, flexible route services, and smaller vehicle sizes that would be amenable to rural public transport. Authorities are forced to choose between classifying service as “regular public transport” or “occasional transport.” Classification as “regular public transport” prescribes things such as driver licensing standards, production of a regular timetable that must be posted at stops, requirement to pickup/drop-off only on bus stops, and minimum vehicle size. The upside of classification as “regular public transport” is that operators receive compensation for concessional fares (e.g. pensioners). Alternatively, authorities may classify a service as “occasional public transport” which provides much greater flexibility but forgoes compensation for concessional fares. The forced distinction between these legal classifications, and their associated trade-offs, misaligns with the foremost need of delivering service quality to beneficiaries in the best possible way.

**The institutional landscape that applies to rural public transport in Poland is fragmented and the first challenge is to get a handle on existing services and gaps in service.** There are three tiers of local government that issue licenses for rural public transport operation: (i) Powiats; (ii) Gminas; and (ii) Marshal’s Offices. At a national level there are 16 voivodeships, 314 rural powiats, and 1,584 rural gminas with a role in Poland’s rural transport sector. Each has authority



# **ZACHODNIOPOMORSKIE E-MODULE**

## WHAT IS AN “E-MODULE” AND WHAT DOES IT DO?

**The Zachodniopomorskie e-module’s primary purpose is to centralize information related to rural transport service and make it useful across tiers of government.** The regime for rural transport licensing in Zachodniopomorskie creates an inherent information gap about transport networks and services. In the first instance, this is due to different tiers of government issuing licenses in paper form within their individual geographical boundaries. Annual reporting of license data and transport statistics flows through the Marshal’s Office and on to the Ministry of Infrastructure. However, this is done in tabular form (i.e. excel spreadsheet) and does not include spatial representation of data in a way that can be visually interpreted over the physical network of infrastructure and services. Individual powiats have attempted to develop spatial representations (see example below) primarily using paper-based maps and hand drawn route information. The limitation of this approach is that it imposes difficulties in sharing, filtering, and using information across administrative boundaries. The e-module solves these issues and combines data in an online platform that allows sharing and graphical display of information across the transport network in the Target Areas.

**FIGURE 7** Prior route information hand drawn on paper maps (example powiat świdwiński)



Source: World Bank Task Team photograph of route information in powiat świdwiński

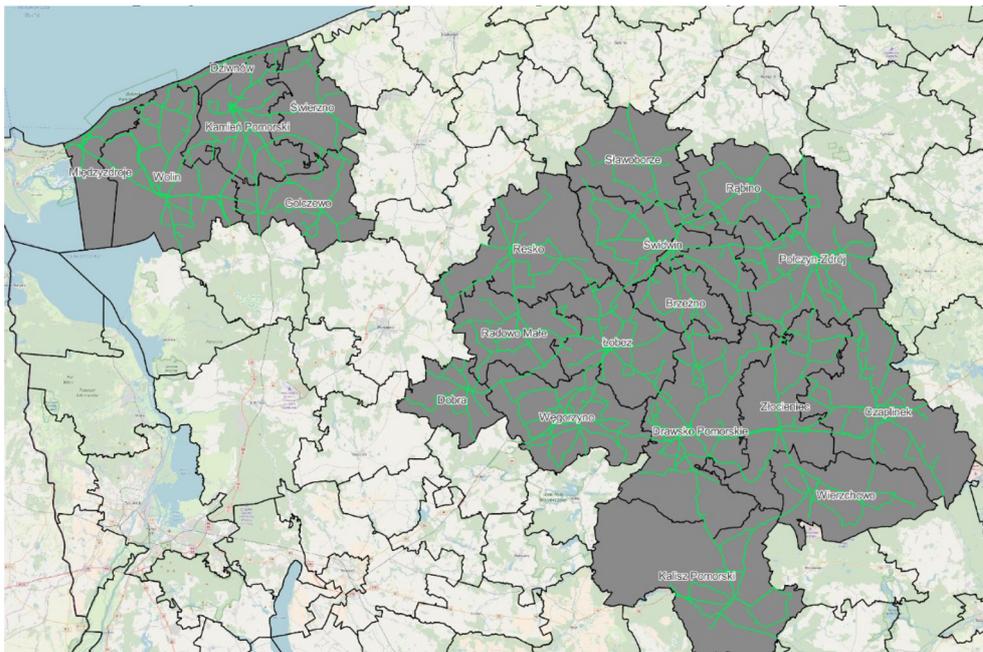
## CONTENT OF THE E-MODULE

The Zachodniopomorskie eModule brings together information on licenses, timetables, public transport infrastructure, public transport services, key demand drivers of trip origins / destinations, demographic data, and administrative data. Table 1 includes a summary of data that has been captured in the Zachodniopomorskie e-module. The e-module assigns sources of information to individual layers that can be toggled on / off to filter information showing to users. The e-module's database is also searchable such that users can target specific data of interest to a specific planning function. This enables offline analysis as may be required to answer specific planning queries.

**TABLE 1** Data used to develop the Zachodniopomorskie e-module

Item	From whom?	Format	Description	Use
Licenses for public transport services	<ul style="list-style-type: none"> <li>Gmina</li> <li>Powiat (majority)</li> <li>Marshal's Office</li> </ul>	<ul style="list-style-type: none"> <li>Paper based (and scanned to .pdf) and then mapped in GIS</li> </ul>	Each tier of local government issues licenses to private operators of public transport services	Used to map existing services
Current timetables (all operators)	<ul style="list-style-type: none"> <li>Private / public bus operators (PKS)</li> <li>Regional rail operator</li> </ul>	<ul style="list-style-type: none"> <li>Published by operators and posted at stops (required to match licensees)</li> </ul>	Provides the hours of departures / arrivals at different stops along licensed routes	Timetables used for filtering services between days and off-peak times
Network data (roads + passenger railways)	<ul style="list-style-type: none"> <li>Marshal's Office Transport Departments</li> </ul>	<ul style="list-style-type: none"> <li>GIS formats</li> </ul>	Provides a base map of the physical infrastructure network (including bus stops)	Integrated in base map layers to facilitate planning
Demand generators	<ul style="list-style-type: none"> <li>Marshal's Office</li> </ul>	<ul style="list-style-type: none"> <li>GIS</li> </ul>	Locations of key origins or destinations for trips such as schools, hospitals, post offices, shopping areas, administrative buildings, etc.	Included as controllable layers that users can switch on / off for planning services etc.
Demographic information	<ul style="list-style-type: none"> <li>National statistics</li> </ul>	<ul style="list-style-type: none"> <li>Excel</li> </ul>	Population and population density information	Included to provide a view of beneficiaries

**FIGURE 8** Example of e-module data – the existing route network for rural public transport



Source: IDOM consultants using Zachodniopomorskie e-module data

**The Zachodniopomorskie e-module offers: (i) web-based interface for graphical display of information; (ii) protocol for managing users; and (ii) a database of infrastructure and route information.** Specifically, this includes

- A web portal interface for gminas, powiats, and the Department of Infrastructure and Transportation to view bus stop locations, the physical transport network, locations of key demand generators (schools, health centers, shopping areas, etc.), demographic data, and routes for regular public transport spatially (i.e. lines on a map) and in tabular form. Ability to view information is available to all categories of users with access to the e-module. Layer control allows users to filter the type of information displayed at any given time;
- A system of user classifications of e-module operators with permissions to change or download information from the e-module. This is achieved through individually registered users who receive one of two categories of permissions, including: (i) “Administrative Level” which enables data modification; or (ii) “Standard User” which provides access to view or download data (but not make changes);
- Data export capabilities for General Transport Feed Specification (GTFS) compatibility. This enables the e-module’s data to interface with other applications designed to provide information to public transport customers (e.g. Google Maps and third-party trip planning applications). The e-module’s current data is “static” such that it does not include real-time information of vehicle locations while they are in service (which would require onboard vehicle tracking systems). If future development provides onboard vehicle tracking in Zachodniopomorskie or some segment of its rural transport networks (such as DRT schemes) real time information on vehicle location could complement the e-module’s static data and be available to customers via streaming GTFS information. Piloting real time information could be an option under proposed DRT pilots if authorities and the European Commission agree to fund investments required for onboard-vehicle tracking.

**TABLE 2** Example of e-module data – bus stop summary

Gminy	Stops count	With bus sign	With pedestrian crossing	With illumination	With bus bay	With timetable	With sidewalk	With shelter	With bus platform	With PRM facilities	With bench
Połczyn-Zdrój	116	73%	8%	41%	28%	38%	14%	54%	16%	5%	50%
Brzeżno	39	87%	10%	54%	15%	38%	26%	44%	23%	3%	41%
Świdwin	107	92%	15%	50%	29%	37%	23%	36%	25%	9%	32%
Sławoborze	52	73%	15%	46%	27%	38%	33%	56%	29%	17%	56%
Dobra	32	78%	13%	63%	38%	34%	38%	38%	47%	0%	47%
Węgorzyno	97	90%	13%	56%	41%	30%	28%	47%	43%	15%	49%
Radowo Małe	61	87%	18%	61%	41%	30%	34%	56%	41%	8%	46%
Rąbino	36	61%	8%	56%	31%	44%	25%	75%	42%	11%	69%
Łobez	76	87%	13%	68%	43%	33%	28%	59%	50%	17%	61%
Resko	76	95%	26%	76%	38%	26%	37%	53%	43%	22%	51%
Czaplinek	85	78%	13%	64%	38%	76%	21%	72%	34%	20%	71%
Złocieniec	62	68%	34%	65%	44%	50%	42%	53%	47%	34%	60%
Drawsko Pomorskie	77	66%	35%	74%	53%	31%	47%	60%	52%	17%	62%
Świerzno	39	56%	33%	72%	46%	36%	38%	72%	56%	18%	74%
Kalisz Pomorski	67	72%	36%	64%	61%	43%	40%	61%	66%	28%	61%
Wolin	112	66%	29%	66%	66%	56%	34%	68%	62%	33%	62%

Gminy	Stops count	With bus sign	With pedestrian crossing	With illumination	With bus bay	With timetable	With sidewalk	With shelter	With bus platform	With PRM facilities	With bench
Golczewo	43	58%	35%	86%	56%	40%	51%	72%	63%	33%	60%
Kamień Pomorski	88	63%	38%	66%	59%	49%	49%	67%	58%	40%	68%
Wierzchowo	32	53%	44%	84%	47%	47%	50%	78%	53%	38%	75%
Świdwin (city)	19	100%	74%	84%	84%	47%	74%	53%	84%	47%	63%
Międzyzdroje	34	97%	71%	82%	79%	82%	68%	59%	85%	59%	71%
Dziwnów	22	100%	91%	68%	100%	82%	82%	86%	77%	77%	82%
<b>Grand Total</b>	<b>1,372</b> (see note)	<b>77%</b>	<b>25%</b>	<b>63%</b>	<b>45%</b>	<b>43%</b>	<b>35%</b>	<b>58%</b>	<b>46%</b>	<b>22%</b>	<b>57%</b>

Source: Zachodniopomorskie e-module.

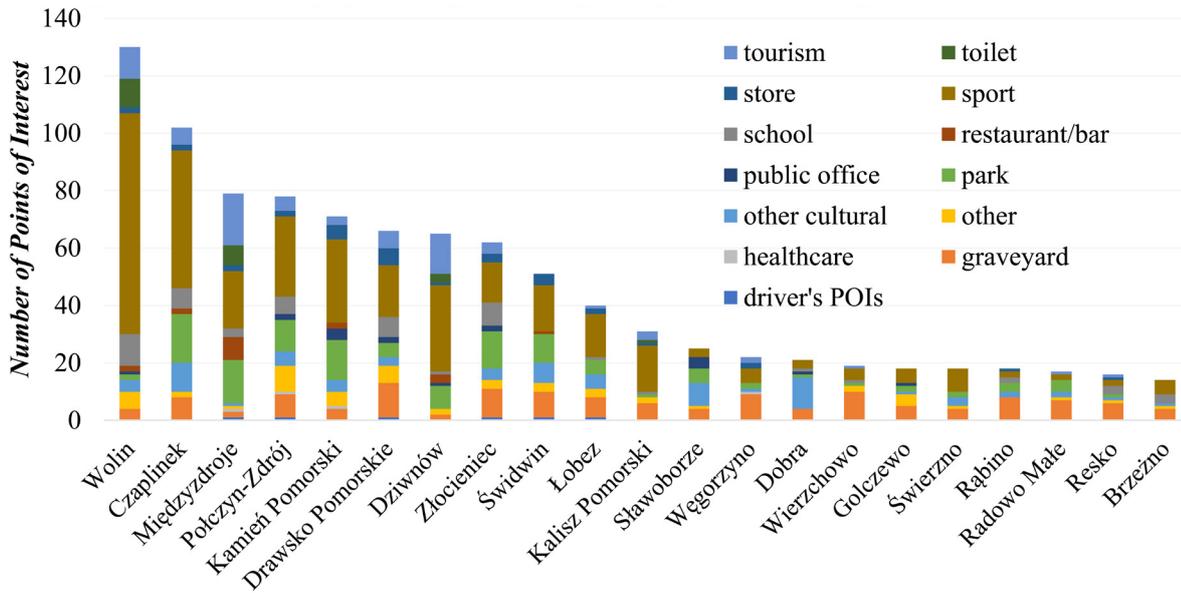
Notes: Only includes stop that can be located and surveyed. An additional 6 stops are included in public data but not physically present based on field investigation.

**The database structure for the e-module includes 66 categories of “points of interest” that generate demand for transport, 4 categories of parking facilities, 4 categories of railways, and 7 road types.** Users can filter against these fields in order to analyze specific infrastructure gaps in the Target Areas. The e-module also includes 1,372 bus stops that have been geolocated, photographed, and cataloged (the exact number and location of stops was previously unknown). The demographic data in the e-module includes: (i) population by gender in each gmina; (ii) age profile of the population by gmina; (iii) registered unemployment levels by gmina. Users are able to overlay GIS route maps on this data such that future planning of transport networks can include specific consideration for the nature of beneficiaries as well as the spatial configuration of infrastructure networks.

## PUTTING THE E-MODULE TO USE

**Use the e-module to understand the potential travel needs of residents living in underserved areas and to target interventions accordingly.** For example, gminy such as Wolin, Międzyzdroje, and Czaplunek that have many points of interest captured in the e-module, a thesis for rural transport connectivity may be shorter trip linkages within the immediate geographical area. In gminy such as Wierzchowo, Golczewo, Świerzno, Rąbino, Radowo Małe, Resko, and Brzeźno that have few points of interest and high levels of unemployment, communities likely require longer distance services. Action by public authorities should reflect these unique needs. For example, the DRT pilot #1 (Wysoka Kamieńska – Powiat Kamieński / Gmina Golczewo) would seek to integrate Gmina Golczewo with regional rail services for longer distance trips to Szczecin and Goleniów. In contrast, DRT pilot #5 (Wierzchowo – Powiat Drawski / Gmina Wierzchowo) aims to link rural populations in Gmina Wierzchowo with Złocieniec and Czaplunek which has a much higher density of points of interest where trip-makers may seek to travel for economic activity or services.

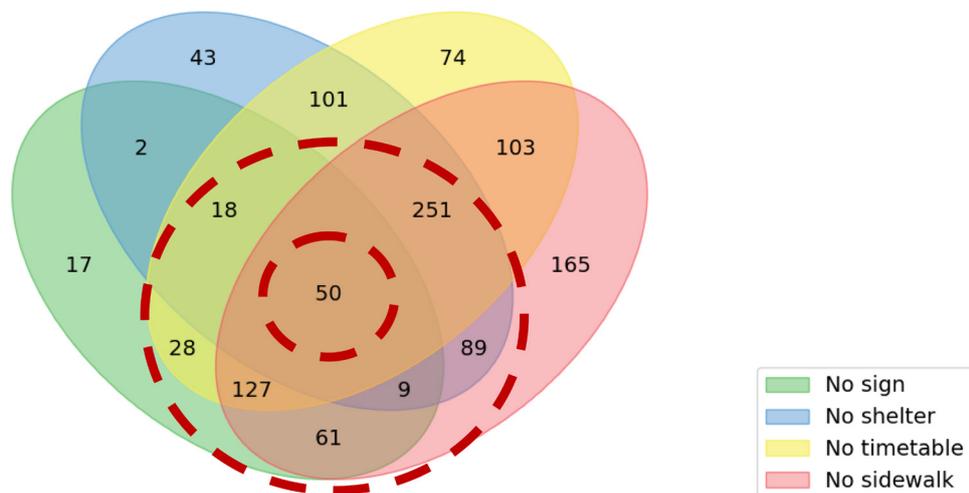
**FIGURE 9** Summary of demand generators – points of interest in the Target Areas



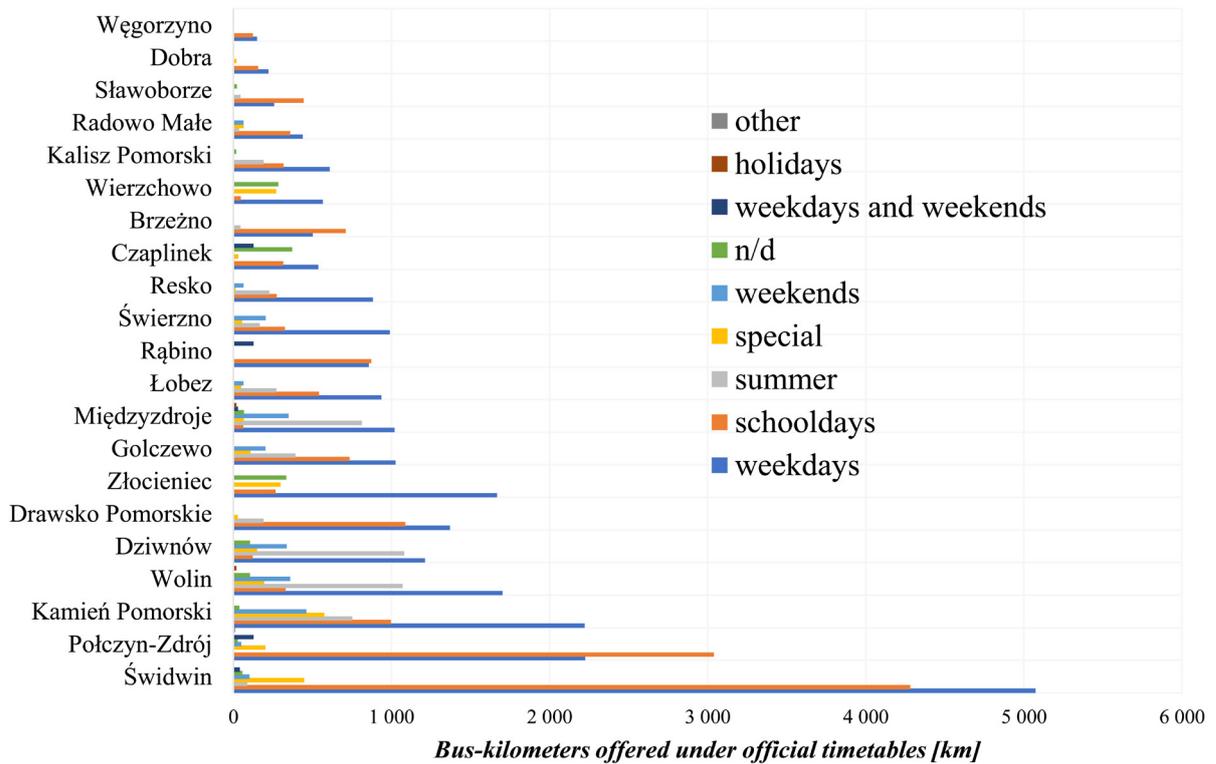
Source: IDOM consultants using Zachodniopomorskie e-module data

**Use e-module data to structure a multi-year investment approach that targets both infrastructure AND services.** The scale and scope of needs suggested by e-module data implies that addressing Zachodniopomorskie’s rural transport needs requires multi-year programmatic approach. This should include three key elements: (i) expansion and densification of rural bus services; (ii) upgrading or new development of infrastructure such as stops and interchange facilities; and (iii) enhancements to integration within modes (i.e. bus-to-bus) and between modes (e.g. bus to rail). Targeting according to both need and presence of opportunity are critical to success. Figure 11 (below) shows one example of how that may look in the case of rural bus stops where e-module data shows that 50 bus stops in the Target Areas have no form of improved infrastructure and a further 583 lack key infrastructure elements. Upgrading works at these locations could be prioritized within a multi-year capital program. Similarly, Figure 12 (below) shows service patterns across the Target Areas segmented by days of the week and holidays. Targeting incremental services at times when fixed route services offers a strategy for addressing these gaps as has been proposed in the design of all DRT pilots.

**FIGURE 10** Targeting investment – example, addressing gaps at bus stops with poor facilities

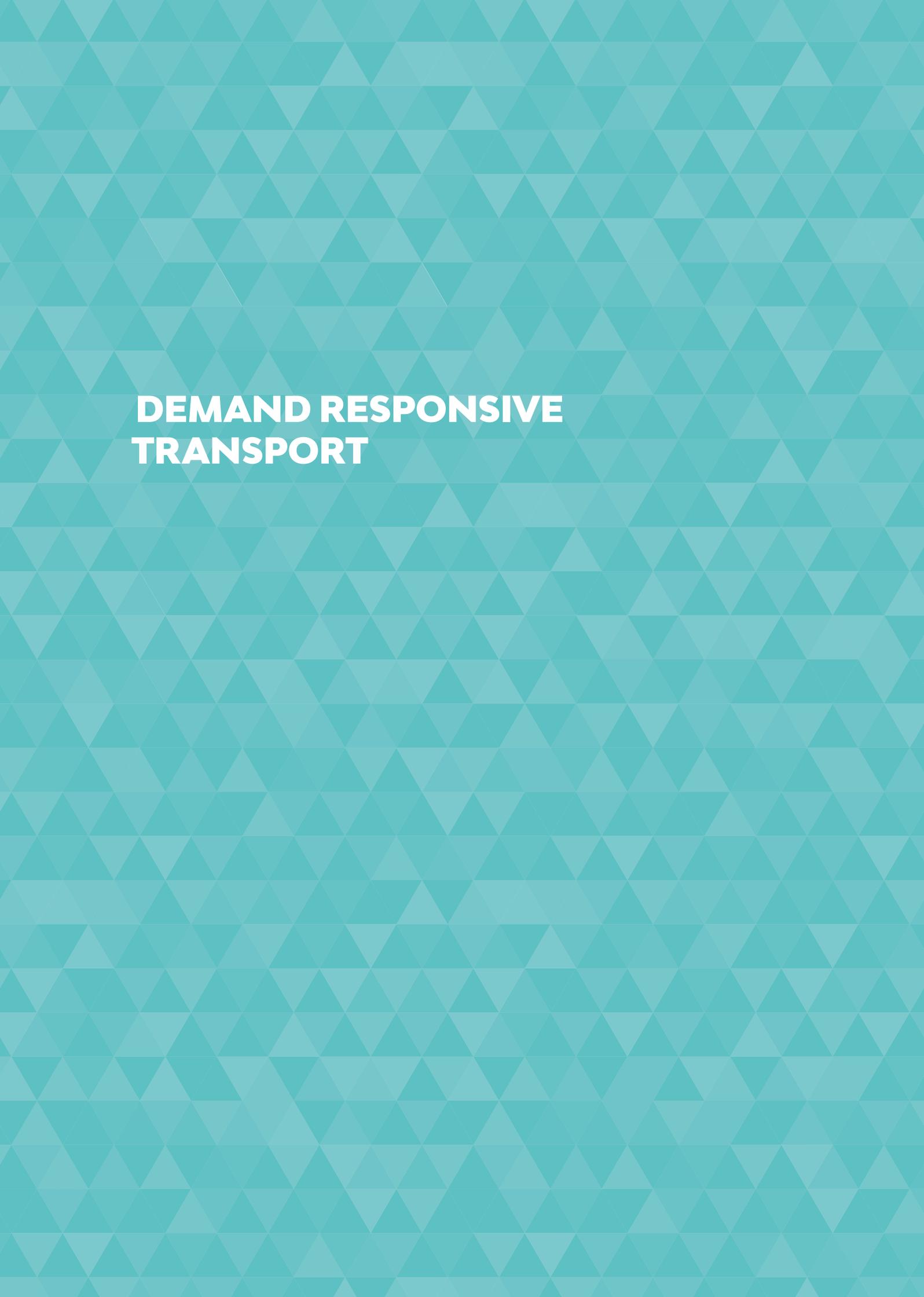


**FIGURE 11** Targeting areas with and without services



Source: IDOM consultants using Zachodniopomorskie e-module data

**For the near-term future it is recommended that the Marshal’s Office retain sole Administer Level permissions for the e-module.** The e-module’s structure allows for additional users (e.g. powiats and gminy) to have Administer Level access which enables modification of data. The Marshal’s Office currently has the best capacity for managing data quality and using GIS tools. In the future, powiats and gminy can be encouraged to develop this capacity and receive Administer Level permissions. However, allowing additional permissions should be pursued gradually as familiarity with the e-module increases with time and trainings can be provided on the use of open-source GIS tools that are used to import data into the e-module. During the e-module’s initial launch period it is recommended to provide trainings and standby technical support to address inevitable requests for functionality enhancement. The proposed Work Program in Table 6 includes such activities under a successor to the Catching Up Regions 3 program.

The background of the entire page is a repeating pattern of teal-colored triangles. The triangles are arranged in a grid-like fashion, with some pointing up and some pointing down, creating a complex, tessellated geometric design. The color is a consistent medium teal throughout.

# **DEMAND RESPONSIVE TRANSPORT**

**Developing a way forward for addressing poor rural transport required thinking beyond traditional fixed-route bus services.** Preliminary analysis of Zachodniopomorskie’s context suggested that economic and fiscal viability of traditional all-day and all-year fixed route bus services in underserved areas would be difficult to achieve. The methodology for this activity therefore focused on Demand Responsive Transport (DRT) solutions that have been used in Europe and elsewhere to provide access in rural areas. DRT is a road-based public transport alternative that typically uses smaller buses / vans that do not operate according to a fixed schedule. DRT makes use of flexible service routes that allow for coverage of geographically large lower population density areas. This works through pre-booking schemes that combine both new and old technologies (e.g. booking rides by voice over a landline). The routing of vehicles and the travel times for passengers are optimized according to actual demand such that services “flex” to customer needs and operators make efficient use of their rolling stock and human resources by not running empty routes.

## DRT KNOWLEDGE DEVELOPMENT

**Learning from Polish and other European experience was used to enhance the likelihood of successful implementation of Demand Responsive Transport pilots.** The approach adopted for this activity was to first examine experience within Poland and to subsequently broaden learning beyond Poland to other examples in the European Union. Poland has two operating examples of Demand Responsive Transport. The first (and oldest) is the Kraków Tele-bus which was established in 2007. More recently, the municipal transport operator in Szczecin also initiated Demand Responsive Transport services in 2017. While Poland’s two operating DRT systems offer valuable lessons, they also operate in urban / peri-urban contexts which are significantly dissimilar to the context found in rural Zachodniopomorskie. For this reason, the CUR3 transport component also sought to learn from other European systems, most notably the rural Demand Responsive Transport schemes operated in the Stirling (Scotland, UK) where population densities in the service areas are low. The overall methodology for developing Zachodniopomorskie’s knowledge of DRT was to learn local operating conditions from Polish authorities while supplementing that with international learnings in aspects of Demand Responsive Transport that are unfamiliar in Poland.

**Officials from the Marshal’s Office, powiats, and gminy participated in site visits and knowledge exchange with two Polish DRTs and Stirling County (Scotland, UK).** During knowledge exchange visits delegations engaged with public authorities, operators, dispatchers, and also used DRT services as customers. Knowledge exchange activities sought to capture the essential elements of making DRT systems work effectively in practice. Representatives from the World Bank, Marshal’s Office, powiats, and gminy used lessons and advice from current operators in choosing the proposed design elements that are included in DRT concepts for Zachodniopomorskie.

**FIGURE 12** Demand Responsive Transport knowledge visits (Kraków, Szczecin, Stirling)



Photos (counter clockwise from upper left): (i) field visit to the Kraków Tele-bus; (ii) visit to the Szczecin DRT dispatcher; and (iii) visit to the Stirling County Authority (Scotland, UK) and experience with “handheld” DRT ticketing systems.

**Poland’s two operating DRT schemes evidence the effectiveness of flexible public transport services in areas where fixed route services would not be viable.** Key features of the Kraków “Tele-bus” and Szczecin “Transport on Demand” systems are summarized below. Common elements of each scheme that can be replicated in rural Zachodniopomorskie include: (i) deliberate targeting of DRT services at low access areas rather than using DRT as a primary modality for delivering large scale public transport service; (ii) use of smaller scale rolling stock to reduce capital and operating costs; (iii) authority-managed booking and dispatch systems that coordinate vehicle routing and passenger demands with a minimum of human resource (1 dispatch operator); (iv) deployment of scheduling software to make efficient use of rolling stock that allows for small fleet sizes; and (v) deliberate integration with other modes of public transport. Importantly, the design of both the Kraków “Tele-bus” and Szczecin “Transport on Demand” systems include an emphasis on simplicity at the interface with customers as described in greater detail below.

**TABLE 3** Summary of operating Polish DRT systems

Location	Summary of the service	Use of technology	Key data (FY 2018)
Krakow “tele-bus”	<ul style="list-style-type: none"> <li>Started in 2007 as a solution to replace low demand fixed route services;</li> <li>Covers a subset of roads within a defined geographical area (roughly 6 km long by 1 km wide);</li> <li>Booking allowed up to 30 minutes in advance (after 7:30 AM);</li> <li>Services available 7 days per week (Mon. – Fri. 5:30 to 23:00; Sat. &amp; Sun. 6:00 to 23:00);</li> <li>Telephone bookings possible 7 days per week (Mon. – Fri. 6:30 to 21:00; Sat. &amp; Sun. 7:00 to 21:00);</li> <li>DRT has physical integration, fares integration, and integrated ticketing with wider Krakow bus and tram network;</li> <li>2 vehicle fleet (about 35 seats each) used to provide service but considering introduction of 3rd bus because of high demand; and</li> <li>City wide public transport operator (MPK) delivers service under integrated Public Service Contract for Krakow.</li> </ul>	<p>Bookings available by phone only;</p> <p>No vehicle tracking currently deployed. Pickups coordinated via telephone with drivers;</p> <p>Looking to upgrade fleet and booking system to offer web and smartphone interface as well as vehicle tracking; and</p> <p>Scheduling software used to coordinate services.</p>	<p>Opex: PLN 1.2 million (EUR 279,012)</p> <p>Passenger (2018): Approx. 40,000</p> <p>Avg. Opex/Pax: PLN 30 (EUR 7.0 equ.)</p>

Location	Summary of the service	Use of technology	Key data (FY 2018)
Szczecin "Transport on demand"	<ul style="list-style-type: none"> <li>Started in 2017 to provide new service in outskirt areas where larger buses were not feasible due to terrain and road width limitations;</li> <li>Semi-dynamic DRT service where start and end locations of routes are consistent and vehicle paths / stopping is modified based on actual demand;</li> <li>Fleet of 6 buses (20 seaters) used to provide services in 3 areas. Two areas are corridor type services (4.5 km and 7km in length). The third is an area-type service (area ≈ 2.3 km by 1.5 km);</li> <li>Dispatch and reservation system open 24 hours (3 shift structure for dispatchers);</li> <li>Booking allowed up to 20 minutes in advance though rides generally not guaranteed unless booked one day in advance;</li> <li>Two DRT areas offer 7 day per week service and one offers services 5 days per week. Service in each area is for 12 continuous hours per day. Start and end times vary according to the first demand and continue for 12 straight hours;</li> <li>DRT has physical integration, fares integration, and integrated ticketing with wider Szczecin bus and tram network; and</li> <li>Services are contracted to a private operator who is engaged under the publicly owned transport operator (ZDiTM) with a Public Services Contract for Szczecin.</li> </ul>	<p>Bookings only available by phone;</p> <p>All vehicles equipped with tracking and real-time information system on passenger pickups for driver communications;</p> <p>Buses equipped for disability access (incl. wheelchair lifts); and</p> <p>Uses scheduling software (GMV Transladem).</p>	<p>Opex: PLN 2 million (EUR 465,020)</p> <p>Passenger (2018): Approx. 252,000</p> <p>Avg. Opex/Pax: PLN 7.9 (EUR 1.9 equ.)</p>

**Integrating old and new technology allows greater breadth of customer access to Polish DRT systems BUT greater use of web bookings and vehicle tracking is the future.** In both Szczecin and Krakow, customers book DRT rides using phone calls to each city's respective dispatch centers which then manually enter bookings into scheduling software. Vehicles in Szczecin have real time information systems that relay customer booking requests from the dispatch system to drivers. In Krakow, this is done by phone connection to drivers. In Szczecin, vehicle position is also tracked via onboard systems so that DRT dispatch can advise customers on likely pickup time while simultaneously coordinating vehicles across the DRT networks. In the future, as shown in Stirling County (below) gradual introduction of web bookings may help further simplify the DRT booking and dispatch process in a way that avoids the need for manual entry of booking details. This is recommended for the proposed DRT pilots from their outset to both provide greater booking options for customers and to begin the introduction process of labor-saving technologies from each scheme's early stage.

**Polish DRT systems have identified interpretations of law that allow them to operate as Public Transport Services.** In the case of Krakow and Szczecin this relies on production of a weekly or daily service "skeleton" schedules based on recurrent trip bookings or trips that have been pre-booked well in advance. The service "skeleton" is subsequently modified to accommodate additional bookings and last-minute requests throughout each day in accordance with the service standards for each DRT. In addition to supporting fleet planning, the service "skeletons" provide a basis for Authorities to classify DRT as a Public Transport Service with a regular route. This is considered sufficient to meet the provisions in current Polish legislation for the requirement of a Public Transport Service to have a defined timetable. While this solution works for the urban / peri-urban context found in Krakow and Szczecin, the recommended approach for Zachodniopomorskie's DRT pilots is to pursue legal classification as "occasional transport" for reasons described in Section D.

**Poland's experience of DRT has illustrated the importance of public communication and outreach.** The experience of Polish DRT's also evidences the need for caution is when using DRT to replace existing conventional fixed-route services. The initial rollout of DRT in Krakow aimed at replacing low demand fixed-route public transport services in a low-density section of town. While becoming accustomed to using DRT, residents objected to the loss of fixed route services which compelled MPK (Krakow's public transport operator) to add back some elements of its previous fixed route service. Service redundancy cannibalizes some fraction of demand for both fixed route survives and DRT which is partially responsible for higher operating expense per passenger in Krakow relative to Szczecin. In retrospect, MPK reports that additional effort to sensitize target beneficiaries and a phased program of service realignment could have avoided initially adverse reactions and the need for redundant service. Szczecin appears to have learned from this experience and noted

extensive public information campaigns (leaflets by mail, local radio, and website) in addition to a strategy for using DRT only as an incremental new service. Szczecin's transport authority has attributed this approach with generating high levels of demand when DRT systems first begin operations in new areas (reportedly receiving about 800 requests for rides on opening day in new areas).

## LESSONS FROM STIRLING COUNTY

**Designing DRT schemes to work with existing private transport operators:** Stirling County (Scotland, UK) operates a DRT network that combines area-based and corridor services. This mixed model is adapted to meet different needs throughout the county and to make use of an existing market of private transport operators. The Stirling County Authority uses a framework-style contract that enables multiple operators to deliver service under the control of a publicly operated dispatch center. Private operators also provide hire-car services to the broader market (beyond DRT) and only run DRT service when dispatched by Stirling County's Authority for that purpose. Accordingly, their business model does not depend solely on DRT. When operating DRT services, private operators receive a combination of distance-based cash fare paid by customers (GBP 1.55 – 11.50) in addition to per-kilometer subsidies paid separately by the Stirling County Authority and national government. Customers book rides via phone calls and a newly added website portal (from 2019). The Stirling County Authority's dispatch centre bundles DRT requests and controls the assignment of individual operators to customer pickups using a service manifest transmitted daily to operators in addition to phone calls with each private operating company's own dispatch operation. This also enables the Authority to maintain fiduciary control over DRT subsidies using data from DRT dispatch software. Operators are required to comply with service quality standards and risk removal from the framework contract if they breach those standards. Stirling County's transport authority has exercised this recourse in the past to address deficient performance.

**FIGURE 13** Example of simple & effective customer communications (Stirling Country, Scotland)

### Your Flexible Rural Public Transport

Frequently asked questions

#### The Killin & Strathfillan route map.

We can pick-up and drop off on public and maintained road locations, highlighted in **black** on the map below.

<ol style="list-style-type: none"> <li><b>1. What is DRT?</b> DRT runs like a taxi and allows you to travel within a single designated scheme area or between joining areas.</li> <li><b>2. How much will the service cost me?</b> This service charges close to the cost of a bus fare based on distance travelled.</li> <li><b>3. Will concessionary bus passes be accepted?</b> Scottish National Entitlement Cards (Bus Passes) receive free travel and Young Scot Cards receive 1/3 off and all require to be shown to the driver.</li> <li><b>4. What sort of vehicles will be used?</b> Up to 8 seat vehicles.</li> <li><b>5. How do I amend or cancel my booking?</b> Go online to <a href="http://stirling.gov.uk/drt">stirling.gov.uk/drt</a> or call 01786 404040. Contact the operator directly if same day.</li> </ol>	<ol style="list-style-type: none"> <li><b>6. Where are the pick-up and set-down points?</b> These are at any location where it is safe to stop within the scheme area.</li> <li><b>7. What if there is no availability?</b> Your travel requirements will be met subject to driver and vehicle availability. In the event that your request cannot be serviced you will be offered the nearest available.</li> <li><b>8. Can a relative or friend book on your behalf?</b> Yes.</li> <li><b>9. Which taxi company operates this service in your area?</b> 24/7 Cars LLP: 01838 207 211 Kingshouse Travel Ltd: 01877 384 768</li> </ol> <p><i>This information is correct at the time of print.</i> <i>Please see <a href="http://www.stirling.gov.uk/drt">www.stirling.gov.uk/drt</a> for our full terms and conditions.</i></p>
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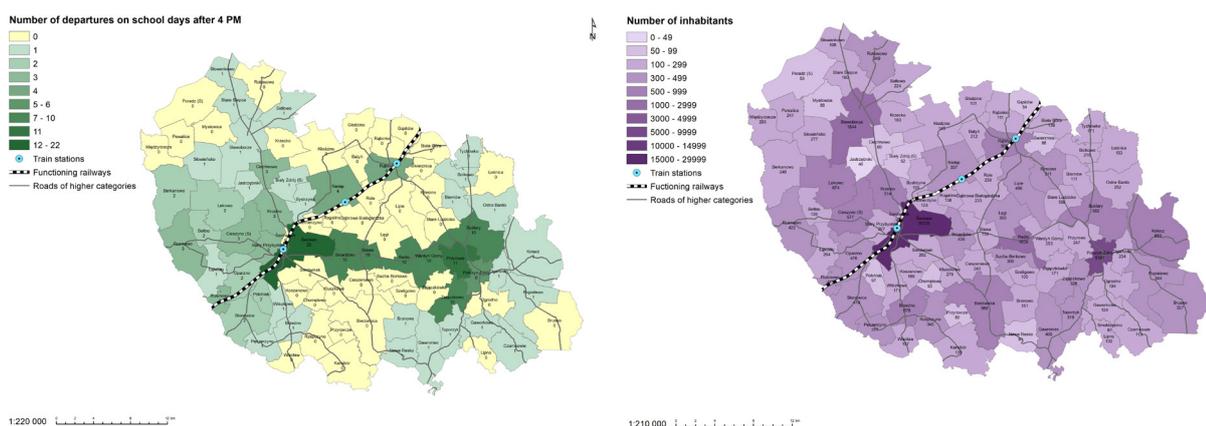
Source: Stirling County Authority

**Stirling County Authority’s new system for web-bookings provides an example that can be replicated in rural Poland.** In December 2018 the Stirling County Authority launched a new system that allows DRT customers to place service bookings via website. This system aims at both increasing customer convenience and enhancing the efficiency of DRT dispatch. Stirling’s phone-based reservation system closes at 3:00 PM (Monday-Friday) whereas web-reservations can be placed after hours. As of April-2019, approximately 19% of Stirling’s DRT bookings were made via website. To date, no operating Polish DRT system enables customers to book via website. However, it is important to note that the availability of internet technologies in Poland has increased rapidly over the recent past – even in rural areas. Data from Statistics Poland’s “Rural areas in Poland in 2016” report shows that the share of rural households equipped with a personal computer increased from 34.8% in 2006 to 70.0% in 2016 and the share of those computers equipped with access to the internet increased from 15.5% to 70.0%. In 2016, the Internet was used by 71.0% of Poland’s rural population aged 16–74 years which was 35.9 percentage points higher than in 2006. As internet availability and use in rural Poland is likely to increase it is recommended that the Zachodniopomorskie DRT pilots would develop website booking tools from the outset under an integrated contract with DRT dispatch software.

## DEVELOPMENT PROCESS FOR ZACHODNIOPOMORSKIE DRT PILOTS

**Proposed DRT pilots were designed with a clear view for the market of existing services and intended beneficiary populations.** Designing DRT pilots involved the following steps: (i) analysis of levels of service for different days and times of day with a view to identifying underserved gminy; (ii) analysis of population data (at the level of solectwo) to identify potential beneficiaries and to maximize the number of people who would benefit from new services; (iii) definition of proposed operating areas and service standards for DRT systems that would alleviate access gaps. Efforts to achieve integrated network performance (e.g. DRT to rail linkages) also factored into the analysis used to establish DRT pilots. The institutional and contractual frameworks proposed for DRT pilots sought to work with the existing market of transport operators and the capacity of powiats and gminy that would have a role in managing service delivery. The World Bank led the design of DRT concepts using both Polish and international team members.

**FIGURE 14** Analysis of “white spots” after 16:00 & population data – example: powiat świdwiński



Source: World Bank analysis and mapping.

Notes: darker shade of green (left figure) denote greater public transport coverage; Darker shades of purple denote higher population density (right figure)

**Six demand responsive transport pilots are proposed across 4 powiats.** Each scheme reflects a different thesis for using DRT with a view to informing future use of DRT in Zachodniopomorskie and Poland. Two proposed pilots target integration of rural bus and rail transport. Four other DRT pilots target improved connectivity with local population centers where customers can transfer to fixed-route bus transport for longer trips. Of these, one proposed DRT pilot aims at preserving access where regular lines have been curtailed due to commercial pressures on a private operator. The concepts for DRT pilots included in annexure provide: (i) proposed service areas, service times, and fleet requirements; (ii) indicative cost estimates and subsidy requirements; and (iii) proposed compensation modalities for contracting. Importantly, there are elements in the proposed DRT pilots that remain subject to further discussions with the European Commission and decisions that local government officials will need to take prior to mobilization. Most notably, it remains to be agreed whether all six pilots would be mobilized immediately or whether a smaller sample (e.g. 3-4) would be prioritized. The funding mix across different levels of government and/or the Regional Operational Program also remains subject to further negotiations across stakeholders. Similarly, there is a need to negotiate the specific roles and responsibilities of each public authority involved in mobilizing and operating pilots. The proposed Work Program for deploying DRT pilots includes the development of a Memorandum of Understanding between authorities for this purpose.

**TABLE 4 DRT Pilots in CFZ and Kamien County**

#	Name	Type of service	Population covered	Thesis for DRT
1	DRT 1: WYSOKA KAMIEŃSKA – POWIAT KAMIEŃSKI/GMINA GOLCZEWO	Two corridors	≈4,796	Railway and DRT integration (commuter traffic)
2	DRT 2: RUNOWO POMORSKIE – POWIAT ŁOBESKI/GMINA WĘGORZYNO	Multiple corridors	≈5,559	Railway and DRT integration (commuter traffic)
3	DRT 3: LUBIN – POWIAT KAMIEŃSKI/GMINA MIĘDZYDROJE	Corridor	≈6,108	Service rationalization and increased flexibility of public transport
4	DRT 4: WOLIN – POWIAT KAMIEŃSKI/GMINA WOLIN	Corridor	≈15,259	Service rationalization and increased flexibility of public transport
5	DRT 5: WIERZCHOWO – POWIAT DRAWSKI/GMINA WIERZCHOWO	Corridor	≈24,303	Provision of incremental access in low density areas
6	DRT 6: ŚLAWOBORZE – POWIAT ŚWIDWIŃSKI/GMINA ŚLAWOBORZE	Multiple corridors	≈19,328	Connection to town centers and use of DRT as feeder for fixed route service

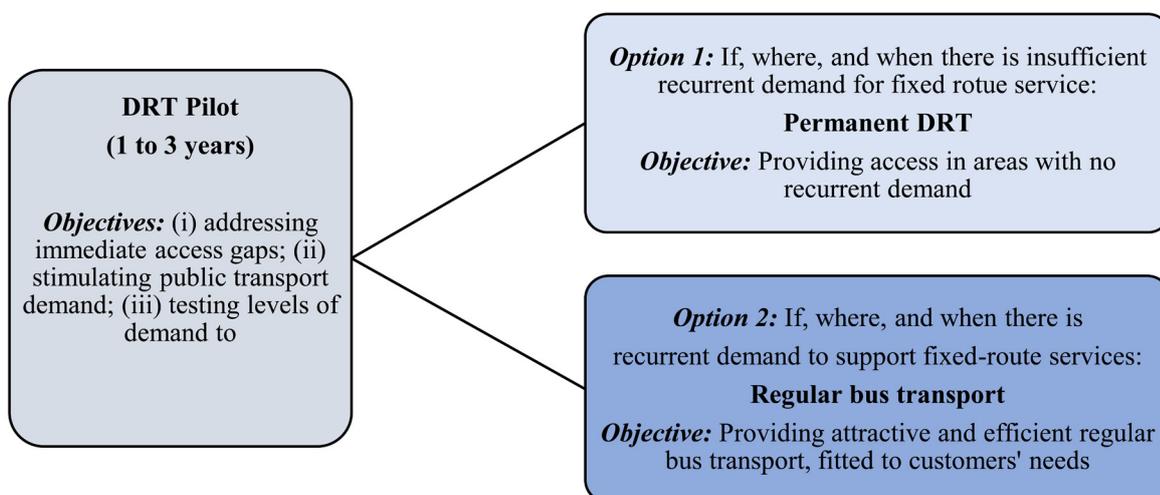
**The process for estimating the financial characteristics of DRT schemes considered local rates for cost drivers and levels of potential demand implied by population densities.** Cost assumptions reflected the team’s analysis of local information from operators (e.g. driver wages, fleet cost, fuel expense). Similarly, revenue estimations included consideration for prevailing fares as well as approximations for potential demand based on population size of individual sołectwa being served. The methodology for estimation included the following:

- Modelling of two to categories of cost drivers: (i) cost of using vehicles (fuel, maintenance, capital); and (ii) hiring a driver. Both were prepared in two scenarios – for smaller passenger cars carrying 7-9 passengers and buses carrying up to 24 passengers;
- Potential passenger demand and proposed fleet configurations for DRT were estimated by dividing the coverage area of each scheme into individual sołectwa being served. At present, there is no detailed data about number of passengers on regular rural bus service in the Target Areas. Therefore, the analytical approach referenced current public transport offerings (number of services) in each area, typical fleet sizes, and approximate passenger loading per vehicle to derive an estimate for the fraction of each population using public transport. This was approximately 0.5% of registered population in off-peak hours and 1.5% of the population during peak hours;

- Each DRT scheme targets 1-3 main “demand driver” origins / destinations such as town centres, railway stations, health facilities, schools, etc. These were used to estimate the potential intensity of passenger loading along different branches of DRT schemes in order to proposed appropriately sized vehicles. Levels of “attractivity” for selected destinations were divided into peak-hours and off-peak-hours depending on the reason for trips to each location (e.g. work, school, shopping). For example, in the case of Golczewo or Węgorzyno (which deliberately aim at integration with railways) DRT demand was expected to concentrate around peak hours when railway services arrive / depart for Szczecin or Goleniów. The level of attractivity of selected destinations was used to segment the number of potential DRT-passengers into specific corridors that they would most likely be interested in using;
- Estimated passengers on given corridors along with physical characteristics of the corridor (e.g. distance) were used to estimate fleet scale, vehicle type needed to serve intensity of demand. In some cases, this implied likely need for larger vehicles or multiple vehicle fleets;
- Passenger fares and subsidy requirements were modelled based on estimated trip distances with a view to key demand drivers and the proposed distance-based fare structure in Table 4 (below). Assumptions regarding the likely number of passengers receiving discounts were based on the current public transport offer in each solectwo and estimates for levels of monthly pass holders on those services. Estimated income of operators included subsidy depended on vehicle km, fares collected from passengers, and refund from local authorities for each monthly-ticket-holder carried. Costs for local authorities included subsidies per vehicle kilometre, reimbursement of monthly-ticket-holder discounts, and in the case of DRT’s with proposed availability payments a fraction of subsidy to cover the cost of drivers;

**DRT pilots are test cases and authorities will need to use results for key policy decisions.** The nature of actual demand for DRT pilots should trigger a decision point after 1-3 years of implementation for local government institutions. In the event of high recurrent demand (i.e. passengers making repeat trips at consistent times) it could be advisable to convert DRT service to regular fixed route public transport with a timetable that meets those needs. In the case of low recurrent demand, DRT pilots should be made permeant to provide access that cannot align with fixed route buses. The results of Zachodniopomorskie’s DRT pilots should also inform Poland’s broader efforts in rural public transport. Changes to the current national legal framework that applies to rural public transport and the national funding architecture for rural transport could be considered for supporting wider uptake of DRT as part of the overall solution to Poland’s rural transport challenges.

**FIGURE 15** Options following DRT pilots for local government authorities



## PROPOSED INSTITUTIONAL AND CONTRACTUAL ELEMENTS OF DRT PILOTS

**Legal classification:** The recommended legal classification for Zachodniopomorskie’s DRT pilots is “occasional transport” under Poland’s Road Transport Law although it should be noted that a formal legal analysis of this approach is required. This category of legal classification includes any kind of passenger transport that is not regular passenger transport<sup>1</sup>, special regular passenger transport<sup>2</sup> or shuttle transport<sup>34</sup>. The primary drawback of pursuing classification as “occasional transport” is that the DRT pilots will forgo reimbursement of concessional fares from the national government. However, the benefits include: (i) no requirement for vehicle sizes to be above 8 seats; (ii) ability to stop at locations other than official bus stops; (iii) no requirement for developing and posting regular timetables; and (iii) drivers licensing requirements linked solely to vehicle size rather than default requirement for all drivers to have a category “D” driver’s license. Importantly, this form of legal classification differs from the classification pursued in Szczecin and Krakow whose systems are classified as “regular public transport.” However, these systems operate in substantially different contexts where population densities and the rigidity imposed by current legal requirements can be managed effectively. Operating requirements for rural Zachodniopomorskie suggest that flexibility to use smaller vehicles with lower operating cost, access to a greater labor pool of available drivers, and ability to provide point to point services (i.e. rather than being confined to bus stops) are critical to scheme success. Additional legal analysis could further investigate whether the other avenues are available to DRT in Poland.

**Net cost contracting (i.e. fares to operators) under individual contracts or framework agreements with multiple operators is recommended for developing DRT pilots.** Proposed pilots envisage contracting with one or more operators with a view to leveraging the existing market and fostering competition for future DRT tenders. This approach would forge any need to establish new operating companies specifically for DRT. Existing operators would tender for a single DRT contract in a specific area or inclusion on DRT frameworks for areas that would use multiple operators. In the case of multi-operator schemes, authority managed dispatch would manage the division of services across different operators with a view to optimizing fleet use and minimizing subsidy. In the case of single operator schemes, all DRT requests would be allocated to the sole selected operator. Operators would collect (and retain) fares paid by customers. Operators would subsequently receive subsidy funding from the public authority monthly based on the approach proposed below. As a condition of participation in a single operator contract or a multi-operator framework, Operators would be obliged to meet basic service quality standards such as minimum response times to new DRT requests, safe driving standards, vehicle cleanliness, and customer courtesy. An integrated complaints mechanism within DRT dispatch services will be important to managing compliance. Similarly, it is recommended that a mechanism be established to undertake spot checks of DRT operations, for example using a “mystery shopper” system of anonymous assessment to verify actual services delivered against contract requirements. The proposed Work Program in section Table 6 proposes JASPERS support for the design of DRT contracts and the tendering of those contracts to the market of operators.

## PROPOSED TECHNICAL ELEMENTS OF ZACHODNIOPOMORSKIE DRT PILOTS

**Booking technologies:** The two proposed booking modalities for all DRT pilots include: (i) over the phone (i.e. direct voice interaction with a DRT dispatcher); and (iii) via website with functionality for use on mobile devices as well as with standard computer web browsers. In the future, if use of DRT systems in Zachodniopomorskie and / or Poland expand, the development of a dedicated smart phone application could be viable. However, this is not an immediate requirement for mobilizing the proposed pilots and would also add additional complexity

to their development. In addition, the need to update mobile apps for frequent updates to smart phone operating systems would require near constant developer support. For customers with access to smart phones, a mobile friendly website for DRT bookings would deliver similar benefits to an application and is therefore the recommended approach.

**Dispatch and vehicle control:** Shared authority-implemented dispatch is proposed for all DRT pilots in Zachodniopomorskie given the demonstrated ability of scheduling software and single DRT dispatchers to manage multiple unconnected schemes in parallel. For example, the Szczecin dispatch center manages three parallel schemes. Stirling Country’s dispatch center manages 9 parallel schemes using a single software package and individual dispatcher who takes calls from 9:00 to 15:00 (Monday-Friday). Beyond cost savings, the use of integrated dispatching also offers benefits for accommodating employee holidays and / or unexpected absences (e.g. occasional illness). Staff working in other public service functions can be trained to temporarily cover dispatch duties on a part-time or call-when-needed basis. Having this in one place next to ancillary public service functions (e.g. a Powiat headquarters) would minimize the use of human resource (and associated cost) needed to manage the Zachodniopomorskie DRT pilots. In practice, this may be easier to achieve in the Central Functional Zone which already provides an institutional basis for cross-powiat collaboration. However, if needed for practical mobilization of the DRT pilots within the existing institutional context, Zachodniopomorskie could consider two DRT dispatch centers – one for the Central Functional Zone and the second for powiat Kamieński.

## PROPOSED FINANCIAL ELEMENTS OF DRT PILOTS IN ZACHODNIOPOMORSKIE

**Distance based fares, single ride tickets, and prices slightly above the cost of fixed route public transport services are proposed for the DRT pilots.** The aim of DRT pilots is to complement and expand the existing market for transport services in Zachodniopomorskie rather than to displace existing operators that are already under intense commercial pressure. Therefore, proposed fare levels are intended to be about 30% higher than average single fares of regular fixed-route bus service. A system of “discount” fares is also proposed for any DRT customer that also hold a valid monthly pass for any other transport operator (bus or rail) serving the Powiat / Gmina in which a given DRT system operates. The intended aim of offering a discount for monthly pass holders is to facilitate integrated trip making for customers such that DRT serves “first / last mile” connections beyond the existing fixed route and railway network. Other critical elements proposed for DRT pilot fares include: (i) a unified fares system for all DRT pilots for the sake of simplicity and consistent customer communications across all Target Areas; (ii) annual adjustment of DRT fares based on comparison with prevailing fares for fixed route bus service in the Target Areas; (iii) no monthly tickets for DRT use – single ride fares only to align with the proposed compensation structure for DRT operators; and (iv) fares paid in cash or via debit/credit card to drivers of DRT service as smart card systems are not widely available in the Target Areas.

**TABLE 5** Proposed structure for Zachodniopomorskie DRT fares

Distance [km]	Single ride		Discount	
	Price [PLN] <sup>a</sup>	Price [EUR]	Price [PLN]	Price [EUR]
0-3	5.00	1.16		
4-6	5.50	1.28		
7-9	6.00	1.40		
10-12	7.00	1.63	2.00	0.47
13-15	8.00	1.86		
16-20	9.00	2.09		

<sup>a</sup> price determined in relation to the prices of regular bus tickets (PKS Gryfice, PKS Kamień Pomorski, PKS Złocieniec, Biały Aran, Iras), slightly higher – not to reduce incomes of regular bus services.

**There are four possible modalities for financial compensation to DRT operators:** (i) fares revenues directly received from passengers in vehicles; (ii) subsidy per km driven with passengers; (iii) reimbursement of discount fares; and (iv) availability fee per day of service offered (applicable to 4 of 6 DRT pilots). Authority managed dispatch and data generated by DRT booking software would provide the basis for calculating monthly invoice amounts in each category of compensation beyond fares paid in cash. A similar approach is used for segmenting compensation to operators under the DRT system operating in Stirling County (although without availability fee). The aim in subdividing compensation is to match closely with the specific fixed and variable costs that operators would incur for delivering DRT services. Importantly, it is recommended that all contracts for DRT services include a cap on the maximum level of public subsidy payable in a given period (e.g. monthly). This would have the effect of capping financial upside potential for operators in the event of high demand in exchange for protection against the risk of extremely low demand that availability payments offer. Below are initial estimates for the cost of DRT operations and subsidy requirements. The specific contract mechanisms that will govern subsidy calculation and the tender regime to applicable to agreeing subsidy levels remains to be developed and is included in the proposed work program for mobilizing DRTs.

**TABLE 6 DRT financial estimates and breakdown of envisaged subsidy sources**

#	Name	Est. cost / yr. [PLN]	Est. Fares / yr. [PLN]	Est. subsidy / yr. [PLN]	Subsidy [EUR equ.]	Subsidy from discounts	Subsidy per-km	Subsidy from availability payment
1	DRT 1: WYSOKA KAMIENSKA – POWIAT KAMIENSKI/GMINA GOLCZEWO	281,040	67,770	213,270	49,587	21%	48%	31%
2	DRT 2: RUNOWO POMORSKIE – POWIAT ŁOBESKI/GMINA WĘGORZYNO	289,861	83,583	206,278	47,962	23%	32%	45%
3	DRT 3: LUBIN – POWIAT KAMIENSKI/GMINA MIĘDZYDROJE	213,813	192,251	21,562	5,013	24%	24%	52%
4	DRT 4: WOLIN – POWIAT KAMIENSKI/GMINA WOLIN	289,832	90,640	199,192	46,314	25%	32%	43%
5	DRT 5: WIERZCHOWO – POWIAT DRAWSKI/GMINA WIERZCHOWO	290,489	144,287	146,202	33,993	51%	49%	0%
6	DRT 6: SŁAWOBORZE – POWIAT ŚWIDWIŃSKI/GMINA SŁAWOBORZE	139,105	167,712	NA (see note)	NA	-	-	-

Note: preliminary estimates for DRT 6: SŁAWOBORZE – POWIAT ŚWIDWIŃSKI/GMINA SŁAWOBORZE suggest that a small operating surplus may be possible. This is related to nearby employment opportunities in seaside areas that offer the potential to attract recurrent trips. While this may be the case, it is recommended that public authorities still earmark a fiscal contingency in the event that services require fiscal support – particularly during initial mobilization and initial operations.

**Financial sustainability and refined understand of demand are key objectives for DRT pilots that are reflected in the proposed compensation structure.** This is a key reason for the proposed availability fee component of compensation to DRT operators. Given the lack of experience with rural DRT service in Poland (and actual levels of demand) it may be premature to structure compensation based solely on demand-dependant cashflow streams which would require potential bidders to price speculative factors. Following initial pilot stages (e.g. after 2-3 years of operation), it may not be necessary to continue availability payment once levels of actual demand become known. For example, the current compensation structure for DRT in Stirling County does not include an availability fee component. However, there are two factors that make this possible: (i) an 18 year history of operations that provides market confidence around demand; and (ii) the wider market for hire-car services in the Stirling area which give DRT operators ancillary revenue streams such that human and capital resources that are not used for DRT can be deployed elsewhere. The potential for achieving a similar outcome in Zachodniopomorskie

may exist – particularly in areas with higher densities of taxi operations. However, it is not clear that this approach would be successful until some market familiarity with DRT and knowledge about actual demand develops.

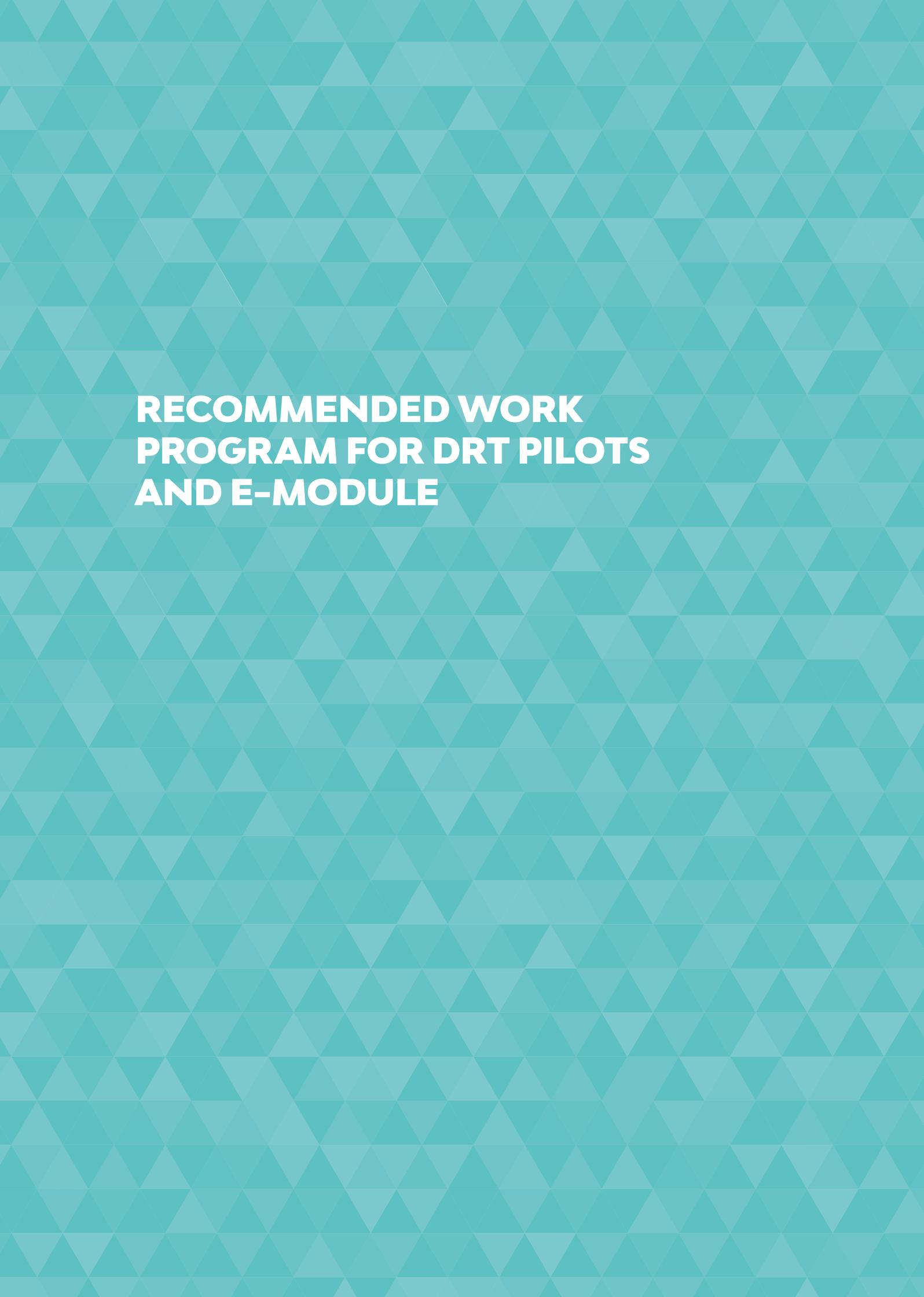
## COMMUNICATIONS PROGRAM FOR DRT PILOTS

**The proposed target audience for communications on DRT pilots is broad with specific channels aimed at subsegments of the population.** For example, it is expected that DRT pilots would benefit older segments of the population (e.g. pensioners) where vehicle ownership is particularly low. Printed forms of media (e.g. pamphlets, posters, etc.) will be an advisable way of reaching this group (see example below). Conversely, youth and students, especially those who participate in after school extracurricular activities are another target segment. Internet communication tools and social media, including, for example, local advertising on Facebook can offer a targeted channel of information for this subsegment.

**The proposed communications program for DRT pilots includes three phases:** (i) preparation for launch; (ii) demand generation for initial operations; and (iii) steady state operations. Proposed activities for each phase are included below:

- **Preparatory phase (about 1 month prior to launch):** This phase would seek to build interest in DRT and distribute basic information on how to begin accessing services. The main purpose of communication in this phase is to inform about new services and to generate curiosity / enthusiasm in improved access options available to rural communities. During this phase, the Zachodniopomorskie DRT website and social media presence should also be launched with functionality for interested customers to register for the service. One week prior to launch, DRT dispatch and the website should come online to begin taking bookings for initial services. Distribution of printed pamphlet materials should take place at public offices, in churches, in health facilities, via post (e.g. concurrently with pension payments), in schools, and in shopping areas. In areas where DRT service will target integration with other modes, printed materials should be available in vehicles of adjoining transport operators who will financially benefit from greater demand fed from DRT. It would also be advisable to organize workshops with fixed route bus drivers / train conductors / train station staff on DRT so that they can become promoters through their interpersonal communication with potential customers.
- **Initial operations (first 6 months of operations):** This phase would seek to build demand for DRT service and to encourage high levels of ridership. Radio advertising, sustained distribution of printed materials, and social media activity designed to widely spread information on how to access DRT services would be the focus of this stage. Elected officials from sponsoring authorities should also be asked use DRT services with accompanying press release and media coverage where possible.
- **Steady state operations (beyond 6 months):** This phase will seek to keep customers informed about service (esp. any changes) and to encourage feedback from the customer base on service enhancements. Three key communications channels are envisaged for this stage: (i) interaction with DRT dispatch (over the phone when booking); (ii) the Zachodniopomorskie DRT website and social media feeds; and (iii) in-vehicle information sources. Printed materials with frequent question and answers (see Figure 9 above from Stirling UK) should remain available at key interchange nodes as a means for attracting incremental DRT ridership. Annual reports of Key Performance Indicators from DRT service should be publicly disclosed with summary statistics posted in vehicles and in public buildings. Customer feedback (two-way communications) should take place via: (i) the DRT website; (ii) annual focus groups of DRT customers and operators; and (iii) via simple customer services distributed on vehicles.

**Phases 1 and 2 of the DRT communications program should enlist the support of a professional public relations consultancy.** Coordinated development of key messages across modes of communication and the logistical process of graphic design, printing and distribution of materials would likely benefit from specialized inputs. The proposed work program for deploying DRT pilots includes this as an activity that would run for approximately 8 months during the preparation and early launch phases of DRT pilots.

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# **RECOMMENDED WORK PROGRAM FOR DRT PILOTS AND E-MODULE**

**The Work Program proposed below aims to prepare for the procurement of DRT pilots over a period of 12-18 months.** In addition to the activities proposed below, it may also be advisable to consider an impact evaluation scheme to measure the effect that DRT pilots have on beneficiary populations with a view to informing Poland's future rural transport policies. A rigorous impact evaluation could seek to isolate the impact that DRT has on indicators such as unemployment, household income / expenditures, travel behaviours, and use of government services. Measuring these factors using a "difference in differences" approach could indicate the nature and level of development impact achievable for given levels of spending on DRT with a view to informing Poland's overall rural development approach.

**TABLE 7** Proposed work program for mobilizing DRT pilots

Item	Est. cost / duration	Activities and output	Proposed modality
#1: Support for intra-government negotiations on funding architecture and assigned roles / responsibilities for different authorities	<ul style="list-style-type: none"> <li>• EUR 120,000</li> <li>• 6-9 months</li> </ul>	<ul style="list-style-type: none"> <li>• Develop fiscal cost to provide authorities with budget guidance to support DRT pilots;</li> <li>• Convene stakeholders (gminas, powiats, Marshals Office, Ministry of Infrastructure, and DG REGIO) and present options;</li> <li>• Collect feedback from authorities on preferred option;</li> <li>• Conduct focused expenditure review of public institutions in target areas that would have a funding role in DRT pilots, including: (i) Zachodniopomorskie Marshal's Office; (ii) powiats; and (iii) gminy.</li> <li>• Develop funds flow arrangement for contributions from different budgets to support DRT pilots;</li> <li>• Propose a Memorandum of Understanding that Public Authorities can consider to frame roles, responsibilities, and a potential funding architecture;</li> <li>• <b>Output:</b> Memorandum of Understanding on subsidy funding for DRT pilots and division of roles / responsibilities for implementation. This would include local government bodies and potentially one or more national ministries (subject to their willingness to support DRT pilots).</li> </ul>	Inclusion under follow up to CuR3 Program (WB supported)
#2: Market sounding with operators and potential customers	<ul style="list-style-type: none"> <li>• EUR 50,000</li> <li>• 3-4 months</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct initial "road show" program of proposed DRT pilots to obtain operator market feedback on acceptable terms and conditions for contracts;</li> <li>• Conduct customer surveys (e.g. intercept on existing public transport) to understand travel behaviours and needs;</li> <li>• Based on initial market feedback, develop and present proposed framework for key contract terms and conditions to private operators;</li> <li>• Propose any modifications to DRT pilots needed based on incremental information from customer services.</li> <li>• <b>Outputs:</b> (i) final terms of reference for developing tender documentation for DRT pilot; (ii) recommended term sheet for DRT contracts; (iii) recommendation / confirmation of DRT pilots based on customer sounding.</li> </ul>	Inclusion under follow up to CuR3 Program (WB supported)

Item	Est. cost / duration	Activities and output	Proposed modality
#3: Training and standby technical assistance for e-module	<ul style="list-style-type: none"> <li>• EUR 50,000</li> <li>• 9 months</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct workshop training for Marshal's Office, powiats, and gmina on e-module functionality;</li> <li>• Develop additional functionality as requested (on top of basic e-module);</li> <li>• Conduct field training for powiats and gminy on data capture for e-module expansion.</li> <li>• <b>Outputs:</b> (i) workshop training; (ii) field training on data capture techniques; (iii) standby technical assistance support (6 months).</li> </ul>	Inclusion under follow up to CuR3 Program (WB supported)
#3: Design of standard DRT contracts (individual scheme and framework approach)	<ul style="list-style-type: none"> <li>• 3-4 months</li> </ul>	<ul style="list-style-type: none"> <li>• Analyse and adapt tender documentation used for Szczecin DRT operations contract to provide model documents for DRT pilots;</li> <li>• Develop Key Performance Indicator regime for DRT pilots;</li> <li>• Develop contract management framework for DRT pilots to be used by authorities during implementation;</li> <li>• Develop tender schedule and process map for authorities to follow during procurement (link to standard documents);</li> <li>• <b>Output:</b> standard tender documentation for use by public authorities to procure DRT services (one model for framework contracts and one model for single-operator concepts).</li> </ul>	JASPERS
#4: Design of tender specification for DRT dispatch software and booking website	<ul style="list-style-type: none"> <li>• 3-4 months</li> </ul>	<ul style="list-style-type: none"> <li>• Analyse and adapt tender documentation used for Szczecin dispatch software;</li> <li>• Develop scope of work for DRT booking website (to be included in dispatch software tender)</li> <li>• Output: tender documentation for procurement of DRT dispatch software and booking website.</li> </ul>	JASPERS
#5: Tender support for DRT contracting and procurement of dispatch software and booking website	<ul style="list-style-type: none"> <li>• 6-9 months</li> </ul>	<ul style="list-style-type: none"> <li>• Provide ad-hoc support to powiats and gminy during DRT tendering processes including: (i) delivery of a bidders conference; (ii) drafting responses to bidder technical questions; (iii) support to powiats and gminy for tender review upon receipt of offers.</li> <li>• <b>Output:</b> completed tenders for DRT services and dispatch software.</li> </ul>	JASPERS
#6: Public communications and outreach program	<ul style="list-style-type: none"> <li>• EUR 100,000 – 150,000</li> <li>• 9 months</li> </ul>	<ul style="list-style-type: none"> <li>• Development of communications content for the DRT website for all DRT pilots;</li> <li>• Design of promotional materials and information resources for DRT pilots including: (i) posters; (ii) pamphlets; (iii) radio segments;</li> <li>• Design and printing of standard information pamphlets with frequently asked questions / answers and information on book processes.</li> <li>• <b>Outputs:</b> (i) printing and distribution of promotional / information materials to powiats and gminy for public distribution; (iii) launch of information website for DRT pilots; (ii) delivery of radio advertisements for DRT pilots.</li> </ul>	Private public relations consultancy procured under the Marshal's Office with support from the Regional Operational Program
<b>Total</b>	<ul style="list-style-type: none"> <li>• EUR 320,000 – 370,000</li> <li>• ≈ 18 months</li> </ul>		

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# **DRT PILOTS PROPOSED FOR ZACHODNIOPOMORSKIE**

# DRT PILOT 1: WYSOKA KAMIEŃSKA – POWIAT KAMIEŃSKI / GMINA GOLCZEWO

## General Summary and technical characteristics

### Objectives and characteristics of the proposed pilot

This pilot aims at demonstrating the following concepts:

- Railway and DRT integration with DRT used as a railway feeder mode;
- Corridor-based services coordinated with railway timetables around peak hours;
- Targeting DRT at potential commuters working in Szczecin. Specifically, the DRT would target interchange with trains to Szczecin and Goleniów that depart at 5:30 and 6:27 and return services from Szczecin and Goleniów that depart at 16:29, 18:42, 21:18;
- Additional targets would include citizens working night shifts in Szczecin and Goleniów by aiming at train interchanges at 5:24, 6:15, and 20:46.
- Use of a single contracted operator with a larger capacity vehicle (9-seater) to serve demand concentrated around railways timetables.

This scheme has been selected to show intermodal approach to public transport in the region. The peripheral railway station in Wysoka Kamieńska has a relatively frequent train offer but does not have any connection with main town in Golczewo. Existing regular bus lines serve mainly schools. There is currently no connection between buses and trains. Bus services are absent in early mornings and after 16:30, which is a serious obstacle for citizens wishing to work in Szczecin (50 minutes of ride by train) or in Goleniów (25 minutes).

The proposed DRT connection will target approximately 4,800 people.

### Intended impacts of the pilot:

- Expanded access to employment opportunity in Szczecin and Goleniów; and
- Increased demand for public transport (fixed line bus and rail) which may help to sustain commercial operations

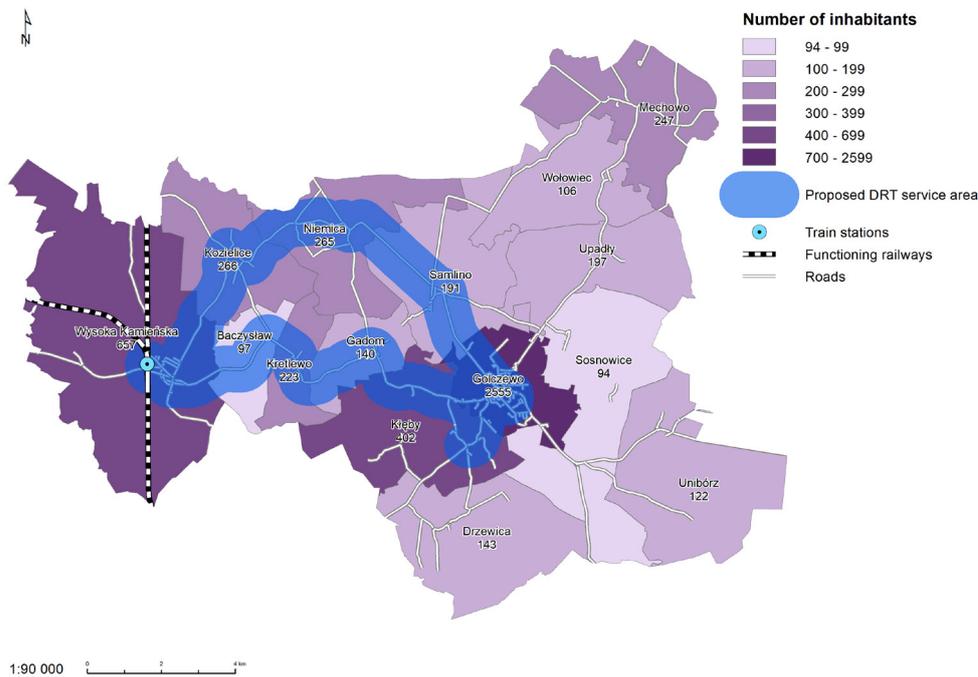
### Target beneficiaries

Village name/ sołectwo	Population	Poviat Avg. Income [2017]	% of avg. income in ZP	Current public transport offer (number of departures)			
				S	H	W	WH
Wysoka Kamieńska	657	3525,59 <sup>a</sup> (915\$)	84, 9%	46	42	22/27	38/38
Kozielice	266			10	-	-	-
Niemica	265			33	26	1/7	12/6
Samolino	191			33	26	1/7	12/6
Golczewo	2555			66	32	12/4	16/8
Kłęby	402			22	15	8/4	8/4
Gadom	140			6	3	-	-
Kretlewo	223			6	3	-	-
Baczysław	97			11	3	-	-
<b>Sum</b>	<b>4796</b>						

S = school days; H = summer weekday; W = weekend (Sat/Sun); WH - summer weekend (Sat/Sun)

a Average monthly gross wages and salaries in 2017; average for voivodeship - 4154,25 PLN (1079\$)

## Scheme map



Proposed service times Weekdays: 5:00-21:45

### Estimated financial characteristics – costs and revenues

Estimated range of capital costs New vehicle costs (if authority provided): up to 115,000 PLN (EUR 26,700)

Estimated operating costs ≈ PLN 281,040 (EUR 67,770) annually

Estimated fares revenues ≈ PLN 67,770 (EUR 15,757) annually

Estimated subsidies required Estimated subsidy needs ≈ PLN 213,270 (EUR 49,587) annually of which:

- 21% from per-km subsidies to support operating costs;
- 48% from reimbursement of discounts;
- 31% from availability payment.

### Contracting model proposed

Contracting approach Contract with 1 operator / 1 vehicle (9-seater) / 2 shifts for drivers.

Proposed compensation approach Net cost contract (farebox to operator), along with:

- Availability fee;
- Subsidy per km driven with passengers;
- Reimbursement of discount for each railway-monthly-ticket-holder

Recommended enabling actions

- Rail/DRT common information campaign.
- Changes (periodic and long term) in the railway timetable should be reflected in updates to the DRT offer (e.g. changes in operating hours if needed to preserve connection)

## DRT PILOT 2: RUNOWO POMORSKIE – POWIAT ŁOBESKI / GMINA WĘGORZYNO

### General Summary and technical characteristics

#### Objectives and characteristics of the proposed pilot

This pilot aims at demonstrating the following concepts:

- Railway and DRT integration;
- Corridor-based services aimed at commuters to Szczecin (interchange to trains to Szczecin and Stargard at 5:37 and 6:07 and from Szczecin and Stargard at 17:24, 18:28, 19:51);
- Additional targets include commuting employees working in Koszalin (interchange to train at 5:47 and from train at 19:43)

This scheme has been selected to target intermodal offerings using DRT. Although gmina Węgorzyno has good access to railway transport, some sołectwa have very weak public transport offering that allow them to access commuter services. This is largely due to missing connections between buses and trains. Divergence of two railway lines in Runowo Pomorskie is also an important factor. Rail stations in Cieszyno Łobeskie and Runowo Pomorskie have relatively good railway offerings (across two lines). However the station in Węgorzyno has much lower frequency. Between Węgorzyno and Runowo Pomorskie there are no regular bus services. Existing regular bus lines serve mainly schools, and there is lack of any service in early mornings and after 16:30, which impedes people from taking employment in Szczecin (65 minutes of ride by train) or in Stargard (35 minutes by train).

#### Intended impacts of the pilot:

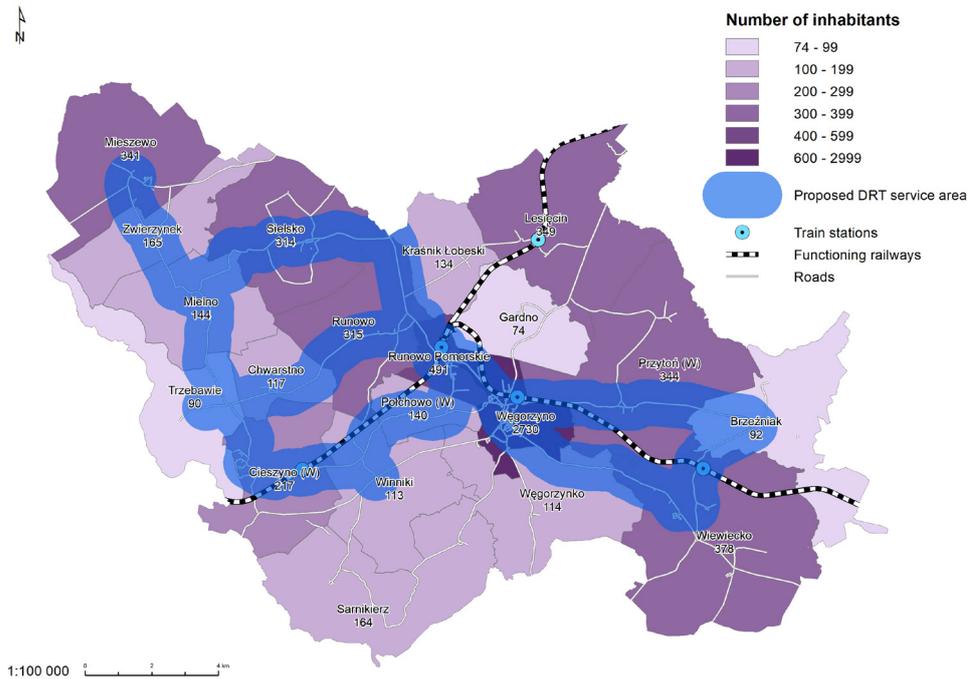
- Expanded access to employment in Szczecin and Stargard;
- Increased connectivity of low population density areas to services in Węgorzyno.

#### Target beneficiaries

Village name/ sołectwo	Population	Powiat Avg. Income [2017]	% of avg. income in ZP	Current public transport offer (number of departures)			
				S	H	W	WH
Mieszewo	341	3662,40 PLN (951\$)	88,2%	12	2	-	-
Zwierzyniek	165			5	-	-	-
Mielno	144			3	-	-	-
Trzebawie	90			-	-	-	-
Cieszyno Łobeskie	217			24	22	18/15	18/15
Winniki	113			2	-	-	-
Połchowo	140			1	-	-	-
Runowo Pomorskie	491			37	33	28/25	28/25
Sielsko	314			3	-	-	-
Węgorzyno	2730			23	14	12/10	12/10
Przytoń	344			4	-	-	-
Brzeźniak	92			-	-	-	-
Wiewiecko	378			9	9	7/5	7/5
<b>Sum</b>	<b>5559</b>						

S = school days; H = summer weekday; W = weekend (Sat/Sun); WH = summer weekend (Sat/Sun)

## Scheme map



Proposed service times Weekdays: 5:00-22:00

### Estimated financial characteristics – costs and revenues

Estimated range of capital costs	New vehicles costs (if authority provided) ≈ 230,000 PLN (EUR 53,500)
Estimated operating costs	≈ PLN 289,861 (EUR 67,396) annually
Estimated fares revenues	≈ PLN 83,583 (EUR 19,434) annually
Estimated subsidies required	Estimated subsidy needs ≈ PLN 213,270 (EUR 49,587) annually of which: <ul style="list-style-type: none"> <li>• 21% from per-km subsidies to support operating costs;</li> <li>• 48% from reimbursement of discounts;</li> <li>• 31% from availability payment.</li> </ul>

### Contracting model proposed

Contracting approach Contract with 1 operator / 2 vehicles (9-seaters) / 2 shifts for drivers.

Proposed compensation approach Net cost contract (farebox to operator), with the following:

- Availability fee;
- Subsidy per km driven with passengers;
- Subsidy for each railway-monthly-ticket-holder.

Recommended enabling actions

- Rail/DRT common information campaign
- Changes (periodic and long term) in the railway timetable will require updates to the DRT offering (e.g. hours of operation)

## DRT PILOT 3: LUBIN – POWIAT KAMIEŃSKI / GMINA MIĘDZYZDROJE

### General Summary and technical characteristics

#### Objectives and characteristics of the proposed pilot

This pilot aims at demonstrating the following concepts:

- Test conversion of an ineffective and inefficient regular bus line into corridor-DRT that operates on passenger demand and eliminates “empty mileage”;
- Use of DRT to enhance flexibility of public transport offering;
- Expanded inclusion in public transport services beyond school transport to also serve needs of workers and citizens needing to access public services.

This scheme has been selected to show utility of DRT-service as a replacement of non-effective and low frequent regular bus services. Existing service is co-financed by gmina Międzyzdroje. The current offering is enough for pupils and passengers with special needs, but does not meet the needs of workers and tourists, which in fact results in missed opportunity to participate of this part of the gmina’s in seaside-tourism industries.

DRT would replace regular bus service will connect ca. 1,000 citizens of 3 solectwa and tourists (visiting yacht marina Wicko-Zalesie and Museum Bunker V3) with Międzyzdroje, main town and interchange node.

#### Intended impacts of the pilot:

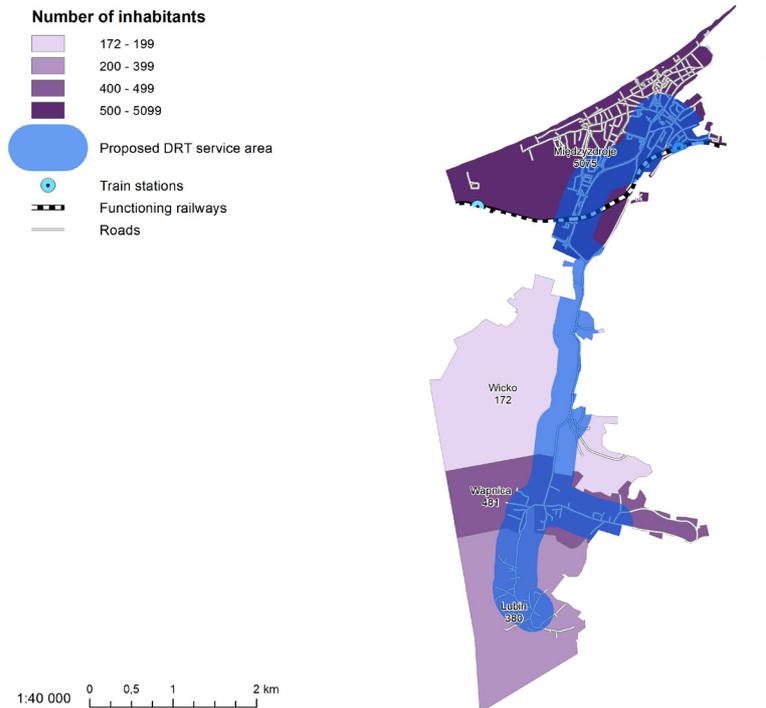
- More effective usage of vehicles with efficiency gain in fiscal spending;
- Expanded demand for public transport through greater flexibility that may eventually support reintroduction of regular bus service but with higher frequency.

#### Target beneficiaries

Village name/ solectwo	Population	PoviatAvg. Income [2017]	% of avg. income in ZP	Current public transport offer (number of departures)			
				S	H	W	WH
Lubin	380	3525,59 PLN (915\$)	84,9%	7	6	3/3	3/3
Wapnica	481			13	12	6/6	6/6
Wicko	172			13	12	6/6	6/6
Międzyzdroje	5075			134	194	104/99	184/174
<b>Sum</b>	<b>6108</b>						

ST = school transport; SWDF = summer weekday fixed route service; WEF = weekend fixed route; SWEF = summer weekend fixed route service(sat/sun)

## Scheme map



Proposed service times Weekdays: 6:00-19:00

Weekends: 10:00-18:00

Summer season weekends: 10:00-22:00

### Estimated financial characteristics – costs and revenues

Estimated range of capital costs	New vehicle costs (if authority provided): up to 115,000 PLN (EUR 26,700)
Estimated operating costs	≈ PLN 213,813 (EUR 49,714) annually
Estimated fares revenues	≈ PLN 192,251 (EUR 44,700) annually
Estimated subsidies required	Estimated subsidy needs ≈ PLN 21,562 (EUR 5,013) annually of which: <ul style="list-style-type: none"> <li>• 24% from per-km subsidies to support operating costs;</li> <li>• 24% from reimbursement of discounts;</li> <li>• 52% from availability payment</li> </ul>

### Contracting model proposed

Contracting approach	Contract with 1 operator / 1 vehicle (9-seater) / 2 shifts for drivers.
Proposed compensation approach	Net cost contract (farebox to operator), including: <ul style="list-style-type: none"> <li>• Subsidy per km driven with passengers;</li> <li>• Reimbursement for each railway-monthly-ticket-holder;</li> <li>• Availability fee.</li> </ul>

## DRT PILOT 4: WOLIN – POWIAT KAMIEŃSKI / GMINA WOLIN

### General Summary and technical characteristics

#### Objectives and characteristics of the proposed pilot

This pilot aims at demonstrating the following concepts:

- Preservation of access using corridor-DRT by reestablishing services following reductions in regular fixed-route bus lines;
- Cost-efficient preservation of access that complements gaps in Poland's commercial model for public transport.

This scheme has been selected to show utility of DRT-service as an access preservation tool where a commercial operator has scaled back market offerings. Existing service was formerly delivered by a commercial carrier who decided to reduce frequency by 75% because of high costs and low revenues. Local authorities see a potential of this connection, especially because of tourist flows along Dziwna river, new settlements developing nearby, and important linkages between the powiat capital and one of the areas main gminas. DRT-service is expected to result in comparable or lower costs while also offering greater flexibility to customers.

DRT replacing closed regular bus service will connect ca. 1,500 citizens in 8 solectwa. Tourists access between Wolin and Kamień will also benefit from DRT services.

#### Intended impacts of the pilot include:

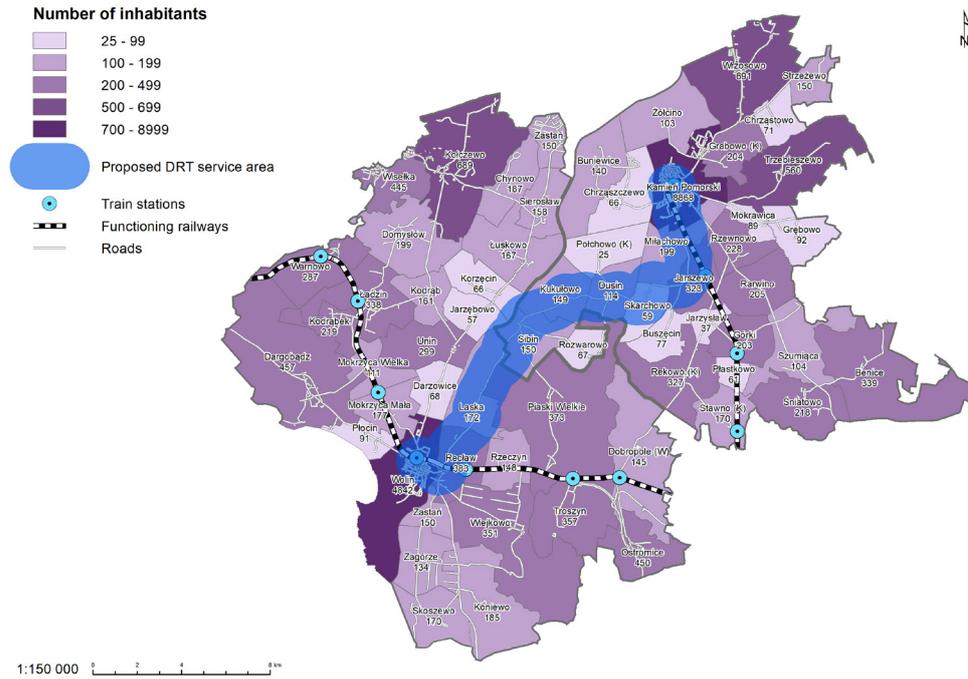
- Preserved public transport access to employment and services in the powiat capital;
- Improved connectivity for tourism along the Dziwna river.

#### Target beneficiaries

Village name/ solectwo	Population	Powiat Avg. Income [2017]	% of avg. income in ZP	Current public transport offer (number of departures)			
				S	H	W	WH
Wolin	4842	3525,59 PLN (915\$)	84,9%	102	102	72/74	82/84
Reclaw	383			50	49	26/28	26/28
Laska	172			5	6	-	-
Sibin	150			5	6	-	-
Kukułowo	149			5	6	-	-
Dusin	114			5	6	-	-
Skarchowo	59			5	6	-	-
Jarszewo	323			42	33	8/12	8/12
Milachowo	199			5	6	-	-
KamieńPomorski	8868			133	119	46/42	101/97
<b>Sum</b>	<b>15259</b>						

S = school days; H = summer weekday; W = weekend (Sat/Sun); WH – summer weekend (Sat/Sun)

## Scheme map



**Proposed service times** Weekdays: 6:00-19:00  
 Weekends: 10:00-18:00  
 Summer season weekends: 10:00-22:00

### Estimated financial characteristics – costs and revenues

**Estimated range of capital costs** New vehicle costs (if authority provided): up to 115,000 PLN (EUR 26,700)

**Estimated operating costs** ≈ PLN 289,832 (EUR 67,389) annually

**Estimated fares revenues** ≈ PLN 90,640 (EUR 21,075) annually

**Estimated subsidies required** Estimated subsidy needs ≈ PLN 199,192 (EUR 46,314) of which

- 25% from per-km subsidies to support operating costs;
- 32% from reimbursement of discounts;
- 43% from availability payment.

### Contracting model proposed

**Contracting approach** Contract with 1 operator / 1 vehicle (9-seater) / 2 shifts for drivers.

**Proposed compensation approach** Net cost contract (farebox to operator) along with:

- Availability fee;
- Subsidy per km driven with passengers;
- Subsidy for each railway-monthly-ticket-holder

# DRT PILOT 5: WIERZCHOWO – POWIAT DRAWSKI / GMINA WIERZCHOWO

## General Summary and technical characteristics

### Objectives and characteristics of the proposed pilot

This pilot aims at demonstrating the following concepts:

- Using DRT as more effective way to provide basic mobility for low population density areas;
- Improving connections with two nearest town centers, which are important local economic and educational hubs and transport nodes. Specifically, there is a therapeutic and educational center in Bobrowo.
- Use of DRT for broad corridor services, covering paved roads linking almost all settlements within gmina Wierzchowo;
- Service delivery by a framework of private operators with the aim of integrating DRT with existing taxi market to make efficient use of existing rolling stock;
- Limited service in Złocieniec and Czaplnek (getting in and out possible only at railway stations), not to compete with regular buses and commercial taxi service.

This scheme has been selected to show utility of DRT in low densely populated area with dispersed buildings where access to nearby town centers is likely to be a primary driver of demand. Providing basic mobility to all citizens of this area using regular public transport would be either very expensive or inconvenient for passengers due to large headways between service. Existing coverage is primarily through school transport with very low levels of public transport offered on summer holidays, weekdays, and during weekends. There is a lack of connections with Czaplnek in the current offering of public transport which is an important destination for the western part of gmina Wierzchowo for employment and access to services. DRT covering most of area of Wierzchowo gmina alone will connect approximately 4,000 very poorly served residents in rural areas with two main towns nearby.

### Intended impacts of the pilot:

- Cost optimization by improving use of existing rolling stock fleets (taxi and minibus) that are underutilized in the area;
- Enhanced demand for fixed route bus services to Czaplnek by feeding passengers from DRT;
- Provision of basic access for rural residents that currently enjoy very little public transport coverage.

Proposed service times Weekdays: 6:00-22:00

Weekends: 9:00-16:00

### Estimated financial characteristics – costs and revenues

#### Estimated range of capital costs

No additional costs (optimised usage of existing cabs and vans for disabled pupils)

#### Estimated range operating costs

≈ PLN 290,489 (EUR 67,542) annually

#### Estimated fares revenues

≈ PLN 144,287 (EUR 33,548) annually

#### Estimated subsidies required

Estimated subsidy needs ≈ PLN 146,202 (EUR 33,993) of which

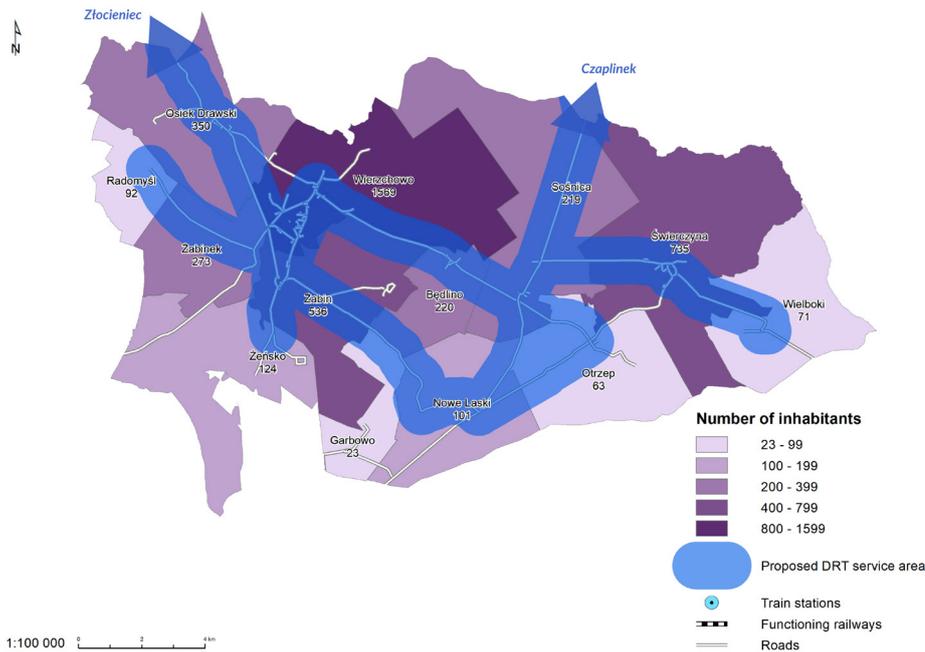
- 51% from per-km subsidies to support operating costs;
- 49% from reimbursement of discounts;
- 0% proposed from availability payment

## Target beneficiaries

Village name/ solectwo	Pop.	Poviat Avg. Income [2017]	% of avg. income in ZP	Current public transport offer (number of departures)			
				S	H	W	WH
Czaplinek	7155	3402,35 PLN (884\$)	81,9%	76	28	14/13	14/13
Sońnica	219			6	-	-	-
Świerczyna	735			9	3	2/2	2/2
Wielboki	71			4	1	-	-
Otrzep	63			6	-	-	-
Nowe Laski	101			2	2	2/2	2/2
Będolino	220			9	3	2/2	2/2
Żabin	536			3	3	2/2	2/2
Żeńsko	124			3	3	2/2	2/2
Żabinek	273			21	7	-	-
Radomyśl	92			3	2	2/2	2/2
Osiek Drawski	350			24	12	2/2	2/2
Wierzchowo	1569			17	6	-	-
Złocieniec	13068			62	40	10/8	9/8
Sum	24303						

S = school days; H = summer weekday; W = weekend (Sat/Sun); WH - summer weekend (Sat/Sun)

## Scheme map



## Contracting model proposed

### Contracting approach

- Framework of operators (minibuses and taxis distributed by DRT dispatch control);
- No specific # of vehicles targeted with objective to access taxi market on a call when needed basis.

### Proposed compensation approach

#### Net cost contract (farebox to operator) including:

- Compensation per km driven with passengers;
- Reimbursement for each railway-monthly-ticket-holder discount provided.

## DRT PILOT 6: SŁAWOBORZE – POWIAT ŚWIDWIŃSKI / GMINA SŁAWOBORZE

### General Summary and technical characteristics

#### Objectives and characteristics of the proposed pilot

This pilot aims at demonstrating the following concepts:

- Using DRT as more effective way to provide basic mobility level for low densely populated areas near the administrative border of the powiat;
- Using DRT as a feeder for fixed-line regular bus service between Świdwin and Sławoborze;
- Targeting of DRT at evenings and weekends (when regular bus service is not available);
- Service delivery by a framework of private operators (likely to include taxi operators from Świdwin) to leverage existing market.

This scheme has been selected to show utility of DRT in low densely populated area with dispersed buildings in with two objectives: (i) feeding regular bus lines; and (ii) providing connections at times and on days of the week with very low public transport offering. Demand for public transport is currently dispersed and low overall such that regular bus service – except peak hours on schooldays – are not a viable option. Existing routes serve mainly school transport. Public transport offer on summer holidays weekdays and during weekends, if exists, is extremely low. DRT covering most of area of Sławoborzegmina alone will connect approximately 3,600 underserved residents of rural areas with Świdwin (directly or with interchange to regular buses).

#### Intended impacts of the pilot include:

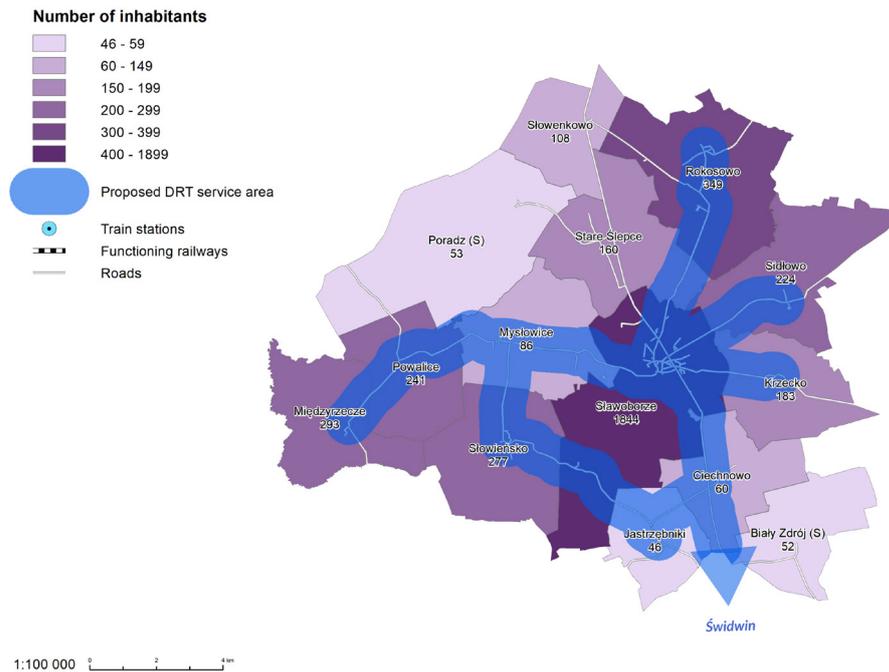
- Improved connection between Sławoborze and Świdwin and increased demand for fixed route bus services to Świdwin in evenings and on weekends by virtue of feeding additional passenger from DRT;
- Enhanced access to employment in Świdwin, Sławoborze and Kołobrzeg (on the seaside, 40 km from Sławoborze with job opportunities in the tourist industry)

#### Target beneficiaries

Village name/ sołectwo	Pop.	PowiatAvg. Income [2017]	% of avg. income in ZP	Current public transport offer (number of departures)					
				S	H	W	WH		
Międzyrzecze	293	3470,74 PLN (901\$)	83,5%	3	2	-	-		
Powalice	241			2	-	-	-		
Mysłowice	86			5	-	-	-		
Słowieńsko	277			4	1	-	-		
Jastrzębniki	46			7	1	-	-		
Ciechnowo	60			38	22	3/3	7/7		
Krzecko	183			3	-	-	-		
Sidłowo	224			12	10	-	-		
Rokosowo	349			-	-	-	-		
Sławoborze	1844			35	21	3/3	7/7		
Świdwin	15725			199	146	35/30	38/32		
<b>Sum</b>	<b>19328</b>								

S = school days; H = summer weekday; W = weekend (Sat/Sun); WH – summer weekend (Sat/Sun)

## Scheme map



Proposed service times Weekdays: 6:00-22:00

Weekends: 9:00-16:00

### Estimated financial characteristics – costs and revenues

Estimated range of capital costs No additional costs (optimised usage of existing cabs and vans for disabled pupils)

Estimated range of operating costs ≈ PLN 139,105 (EUR 32,343) annually

Estimated fares revenues ≈ PLN 167,712 (EUR 38,995) annually

Estimated subsidies required

- Analysis suggest that a small operating surplus may be possible for this DRT pilot on account of nearby employment opportunities in seaside areas that offer the potential to attract recurrent trips. While this may be the case, it is recommended that public authorities still earmark a fiscal contingency in the event that services require support – particularly during mobilization and initial operations.

### Contracting model proposed

Contracting approach

- Framework of operators (minibuses and taxis distributed ad-hoc);
- No specific # of vehicles targeted with objective to access taxi market on a call when needed basis.

Proposed compensation structure in contract

Net cost contract (farebox to operator). If subsidy becomes necessary, it could include the following:

- Subsidy per km driven with passengers; and
- Reimbursement of fares discounts for holders of monthly tickets for other modes (bus and rail)

**COMMUNICATION POSTER  
FOR DRT PILOTS (EXAMPLE  
CFZ SCHEMES)**



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# NOTES

1. passenger transport made at specified intervals and with specified routes, Article 4, paragraph 7, Road Transport Law, 6.09.2001;
2. un-public regular passenger transport, Article 4, paragraph 9, Road Transport Law, 6.09.2001;
3. multiple transport of organized groups of people back and forth, between the same place of origin and the same destination (...), Article 4, paragraph 10, Road Transport Law, 6.09.2001
4. Article 4, paragraph 11, Road Transport Law, 6.09.2001